

# Effectiveness of an educational program on paramedic knowledge and practice concerning pre-hospital burns management for adult at ambulance in Baghdad city

<sup>1</sup> Hassan Rahman Jassm Al Jubouri, <sup>2</sup> Khalida Mohammed K

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## **Abstract**

**Objective:** to evaluate effectiveness of an educational program on paramedic knowledge and Practice concerning adult pre-hospital burns cases care at Ambulance Department in Baghdad City, to identify the association between Effectiveness of an Educational Program and the demographic characteristics of the paramedic (Age, Education Level and Years of Experiences).

**Methodology:** A quantitative research uses quasi-experimental design to evaluate the effectiveness of an educational program on paramedic knowledge and practice concerning pre-hospital burns management for adult at ambulance in Baghdad city. The study was initiated (1st October 2019 to 15th March 2020) Nonprobability (purposive) sample of (60) paramedic was selected from the ambulance department in Baghdad city. (30) paramedic for the study, which were exposed to the education program about pre-hospital burns management for adult, and (30) paramedic have been assigned to the control group who share the same criteria of selection for the study group and are not exposed to the educational program. the instruments was constructed by using a questioner which composed of three parts First Part: The demographic data: This included the Paramedic characteristic, such as gender, age, level of education, years of experience, and training. the second part: Knowledge test (40). The third part: Observational checklist. It is composed of (29) items. The validity of the questionnaire, Observational checklist and educational program were been identified by a panel of 13 experts; the reliability has been identified by adopting a pilot study carried out on (20th November to 11th December 2019). Data were analyzed the through application of descriptive statistics analysis and the inferential data.

**Result:** The current study show that were a highly significant differences between the study and the control group, post applying educational program to knowledge and practice concerning pre-hospital burn management for adult.

**Conclusion:** A there are significant effectiveness of educational program on paramedic knowledge and practice concerning pre-hospital burn management for adult at ambulance in Baghdad City.

**Recommendations:** Approving the program training in the disaster and regional training center for Emergency Medicine.

**KEYWORDS:** paramedic, pre-hospital and burn management

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## **Introduction**

Burns in developing countries account for significant morbidity and mortality which have been shown by increasing burn first aid awareness. In general, flames, scalds, and contact burns are the most common causes (Peck, 2012). As

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<sup>1</sup> Ministry of Health, College of Nursing/University of Baghdad, \* Adult Nursing Department, E-Mail: [hasssn198595@gmail.com](mailto:hasssn198595@gmail.com)

<sup>2</sup>Adult Nursing Department, College of Nursing/University of Baghdad, E-Mail: [khalida\\_mohammed@yahoo.com](mailto:khalida_mohammed@yahoo.com)

far as we are interest with the ambulance care so far, the present study is try to reduce mortality and morbidity of burns by Life-saving techniques, provide knowledge and practice for pre-hospital burns team members and deliver appropriate care to the person is burned in the field (Thind et al., 2015). Emergency medical services are defined as the care management for cases in which delay in care is likely to result in the recipient's death or permanent impairment. Emergency situations are often time-critical, and this is more pronounced in low and middle-income countries where it is stated that at least 45% of deaths and 36% of the burden of disease require urgent care (Javaeed et al., 2018). Pre-hospital burns management knowing what should be done in the first moments of any burn occurrence may turn the results upside down. As for the speed of taking the proper procedures for immediate aid and urgent care for the injured, it may mean the difference between life and death, As far as we are interest with the ambulance care so far, the present study is try to reduce mortality and morbidity from burns by life-saving techniques, provide knowledge and practice for pre-hospital burns team members and deliver appropriate care to the person is burned in the field(Thind et al., 2015). Burn injury involves the largest body organ, the skin. The skin makes up the largest part of the integumentary system (skin, hair and nails). The priority of thermal injury care, Primary and Secondary Assessment and all general principles of Trauma and Burn Care apply to burns. However, there are also some relevant measures of first aid that must be remembered when considering burns. To preserve life, alleviate suffering, prevent further illness or trauma (Palao et al., 2010). When a paramedic responds to burn injured there may be many difficult on scene. During assessment, as a burn injury plus the pain being suffered by the person burned, coupled with the extreme reactions of bystanders and relatives (Bourke & Dunn, 2013). The Providing emergency care to a burned person and according to the instructions and teachings set by international organizations, ambulance burns depend on the cause of the burn (flame, scald, chemical, electrical, inhalation) and degree of burn, that the speed of ambulance burns play important role to reducing of effectively in rates morbidity and mortality to a great extent (Shrivastava & Goel, 2010). A burn is a thermal injury caused by chemical, biological, electrical and physical agents with systemic repercussions and local, these are the most severe form of trauma that has afflicted humanity since time immemorial and that over the years and the scientific revolution has improved the results in its management(Garcia-Espinoza et al., 2017). Burns may be distinguished and classified by their mechanism or cause, the degree or depth of the burn, the area of body surface that is burned, the region or part of the body affected, as well as the extent (Peden et al., 2009). The burn injures is central to all aspects of burn care. The size, depth, and condition of the burn injures directly impacts fluid resuscitation, hypermetabolic response, immune system dysfunction, and predicted survival (Cancio, 2014).

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## Methods

Quantitative research uses quasi-experimental design to evaluate the effectiveness of an educational program on paramedic knowledge and practice concerning pre-hospital burns management for adult at ambulance in Baghdad city. The period of the study was from (15 October 2019 to 15 March 2020).

### Setting Of the Study:

The study was conducted at two centers for endocrinology and diabetes in Baghdad city, which include (Al-Mustansiriya University /National Diabetes Center and The Specialized Center for Endocrinology and Diabetes). These centers were the designated site for data collection, because they are specialized centers that contain consulting units in addition to the presence of special units for conducting laboratory and clinical examinations, and it receives about (100-300) diabetic patients daily, which facilitated the data collection process.

### The Sample Of The Study:

A Non-probability (purposive – sample) of (60) Paramedic was selected from the ambulance department in Baghdad city. (30) Paramedic for the study group. And another (30) Paramedic considered as control group. The study group was exposed to the educational program about pre-hospital burns management for adult, while the control group was not exposed to the program. The control group who share the same criteria of selection for the study group.

### Instrument Of The Study:

The instruments have been constructed through the review of literature and interview with physicians, the questionnaire is composed of three parts:

**First Part:** The demographic data this included the Paramedic characteristic, such as gender, age, level of education, years of experience, and training.

**Second Part:** Knowledge test the second part is concerned with Paramedic knowledge. The knowledge test was composed of (40) multiple choice questions which covered and related to pre-hospital burns management. The questions were scored as correct question (2) points and the incorrect question (1) point. the number of correct responses on the knowledge test questionnaire was used as the measure of the level of paramedic knowledge. The total scores of the test were 80 points. The cut of point was (1.5).

The Paramedic in the study group are presented with a knowledge test prior to the implementation of the education program and retested after completion of the educational program. The Paramedic in the control group are tested at the same time as the study group. Content of questionnaire remains the same for all tests .

**Three part:** Observational checklist this tool was designed by the investigators based on extensive relevant studies and review of literature .This checklist was evaluate effectiveness of education program on Paramedic practice concerning pre-hospital burns management for adult .

The observational checklist was composed of (29) items of practices concerning pre-hospital burns management for adult .

Observational checklist practices were observed Paramedic prior to performing on a mannequin and simulation scenarios during Implementation of an educational program on paramedic.

The educational program consisted of six sessions and was performed in the Emergency Medicine Department. The study instrument was an observation check list of Paramedic practice developed by the researcher for the purpose of this study. Practice checklist to assess the Paramedic practices with respect to procedures of pre-hospital burn management for Adult. The researcher observed and checked paramedic performers (do or do not).

#### Validity of the Instrument:

The content validity of program and the study instrument was determined by the experts panel of (13) experts who had more than five years' experience in their field, they were (8) faculty members from College of Nursing/ University of Baghdad, (1) faculty members from College of Nursing / University of Almutna, (4) specialized physician in emergency medicine department in Baghdad City, To investigate the content of the questionnaire, those experts were provided with copy of study instruments and were asked to review and evaluate the instrument for its content clarity and adequacy. Some items were excluded and others were added after taking all the comments and recommendations into consideration. The questionnaire was considered valid after performing the modifications that based on their paramedic.

#### Reliability Of The Instrument:

The reliability of the questionnaire of Paramedic Knowledge and Practice Concerning pre-hospital burn management for Adult. The items are determined through the use of (test and retest). The Paramedic is selected from Ambulance Department in Baghdad City. It is applied to Paramedic who had the same criteria of the original study sample to determine the Alpha Correlation knowledge( $r = 0.91$ ) and practice ( $r = 0.88$ ) This means that the instrument was adequately reliable (Barton & Peat, 2014).

#### Statistical Methods:

The data were analyzed by using SPSS (Statistical Package for Social Sciences) version 24.0 application of the statistical analysis system. The subsequent statistical data analysis methods were used to analyze and assess the results of the study by descriptive statistics (frequencies, percentages, and the arithmetic mean and standard deviation) and statistical inferential (Pearson Correlation Coefficient, T-Test and ANOVA Table test).

#### Results

**Table (1): The Distribution of the Study Samples (Study and Control) according to the Demographical Data.**

Variable	Groups	Study group		Control group	
		Freq.	%	F.	%
Age Groups	20-29	6	20	1	3.3
	30-39	17	56.7	13	43.3
	40-49	5	16.7	8	26.7
	50 and over	2	6.6	8	26.7
	Total	30	100	30	100
	$\bar{x} \pm SD$	2.1 + 0.801		2.77 + 0.898	
Gender	Female	0	0	0	0
	Male	30	100	30	100
	Total	30	100	30	100

	<b><math>\bar{x} \mp SD</math></b>	2 + 0.0		2 + 0.0	
Educational level	Nursing Course	1	3.3	0	0
	Nursing School	2	6.7	1	3.3
	Secondary Nursing School Graduate	13	43.3	9	30
	Nursing Institute Graduate	14	46.7	20	66.7
	Total	30	100	30	100
	<b><math>\bar{x} \mp SD</math></b>	3.33 + 0.758		3.63 + 0.565	
Years of Experience	1.5	6	20	0	0
	6-10	10	33.3	14	46.7
	11-15	9	30	4	13.3
	16-20	3	10	4	13.3
	21 and over	2	6.7	8	26.7
	Total	30	100	30	100
	<b><math>\bar{x} \mp SD</math></b>	2.5 + 1.137		3.2 + 1.29	
Participation in Courses of advanced first aid	Yes	30	100	30	100
	Total	30	100	30	100
	<b><math>\bar{x} \mp SD</math></b>	1 + 0.0		1 + 0.0	
Number of training sessions	1-3	13	43.3	11	36.7
	4-6	12	40	14	46.7
	7-9	4	13.3	5	16.6
	10-15	1	3.4	0	0
	Total	30	100	30	100
	<b><math>\bar{x} \mp SD</math></b>	1.77 + 0.817		1.8 + 0.714	
Location of Session	Iraq	30	100	30	100
	Total	30	100	30	100
	<b><math>\bar{x} \mp SD</math></b>	1 + 0.0		1 + 0.0	

**Freq.= frequency, % = percentage, P=P.value,  $\bar{x} \pm SD$  = arithmetic Mean ( $\bar{x}$ ) and Standard Deviation (S.D.).**

Table (1) showed that the majority (56.7) percent of the study group were within age group (30 - 39) years old; while, the highest percentage (43.3) of participants in the control group within the age group (30 - 39) years old. Table (1) also presented that participants in both the study and control groups were males (100) percent.

Corresponding to the Level of education of the study sample, the highest percent of both the study group and control group were within nursing institute graduate with (46.7) and (66.7) percent respectively.

In relation to the years of experience, the highest percent of the study group (33.3) had (6 – 10) years of experience, and the highest percent of the control group (46.7) had also (6 – 10) years of experience.

Table (1) showed that participants in both the study and control groups were participated totally (100) percent in courses of advanced first aid. Moreover, the largest percent of the study group (43.3) percent were participated in 1 – 3 training sessions, and (46.7) percent of the control group were participated in 4 – 6 training sessions. In addition, all training sessions (100) percent were accomplished inside Iraq.

**Table (2): Comparison significant of pre and post-test knowledge and practices scores for the study sample.**

Score	N	M	SD	t	df	P.value	Sig.
Pretest and Post-test knowledge	30	1.23	0.67	9.95	29	0.000	H.S
Pretest and Post-test knowledge (Second Part)	30	1.26	0.52	13.3	29	0.000	H.S
Pretest and Posttest Practices	30	1.36	0.49	15.27	29	0.000	H.S

**N= number, M = mean of score, SD= standard deviation, NS =non-significant at P>0.05, S= significant at P<0.05**

Table (2) presented highly significant differences of the knowledge (first and second parts) of the whole study sample between pre-test and post-test score at p value (0.00). Moreover, a high significant difference was also presented among the whole study sample pre-test and post-test practices at p value (0.00).

**Table (3): Correlation between Socio-demographic Variables with the first part of knowledge (post-test) by ANOVA.**

Socio-demographic variables		(N=30)					
		posttest					
		Sum of squares	df	M.S	F	P value	Sig.
Age	Between groups	3.47	3	1.15	6.22	0.002	H.S
	Within groups	4.82	26	0.18			
	total	8.3	29				
Education Level	Between groups	3.135	3	1.04	5.26	0.005	H.S
	Within groups	5.16	26	0.198			

	total	8.3	29				
Years Experiences of	Between group	3.70	4	0.925	5.02	0.004	H.S
	Within groups	4.6	25	0.18			
	total	8.3	29				

M.S= mean of score, df= degree of freedom, NS = non-significant at  $P>0.05$ , S=significant at  $P<0.05$

Table (3) showed that there were highly significant relationship between age, education level, and years of experiences of the study group with their first part of knowledge in post-test at ( $P$ .value =.002, .005, and .004) respectively.

**Table (4): Correlation between Socio-demographic Variables with the second part of knowledge (post-test) by ANOVA.**

Socio-demographic variables		(N=30)					
		posttest					
		Sum squares	df	M.S	F	P value	Sig.
Age	Between groups	1.7	3	0.56	8.358	0.000	H.S
	Within groups	1.76	26	0.067			
	total	3.4	29				
Education Level	Between groups	0.345	3	0.115	0.96	0.42	N.S
	Within groups	3.1208	26	0.12			
	total	3.46	29				
Years Experiences of	Between group	1.86	4	0.466	7.291	0.000	H.S
	Within groups	1.6	25	0.064			
	total	3.46	29				

M.S= mean of score, df= degree of freedom, NS = non-significant at  $P>0.05$ , S=significant at  $P<0.05$

Table (4) showed that there were highly significant relationship between age and years of experiences of the study group with their second part of knowledge in post-test at ( $P$ .value =.000, and .000) respectively.

**Table (5): Correlation between Socio-demographic Variables with the practices (Post-test) by ANOVA.**

Socio-demographic variables		(N=30)					
		posttest					
		Sum squares	df	M.S	F	P value	Sig.
Age	Between groups	0.092	3	0.030	0.45	0.71	N.S
	Within groups	1.77	26	0.068			
	total	1.86	29				
Education Level	Between groups	0.174	3	0.05	0.89	0.457	N.S

	Within groups	1.69	26	0.065			
	total	1.86	29				
Years of Experiences	Between group	0.144	4	0.036	0.524	0.71	N.S
	Within groups	1.722	25	0.068			
	total	1.866	29				

**M.S= mean of score, df= degree of freedom, NS = non-significant at  $P>0.05$ , S=significant at  $P<0.05$**

Table (5) showed that, there was no significant relationship between nurses' practices of the study group with their demographic characteristics at the post-test level at ( $P$ .value =0.71, 0.457, and 0.71) respectively.

### Discussion

Showed that the majority of the paramedics participating were between the ages of 30 years and over for both the study group and the control group. The results of our study were based on the results of the study (Knowledge & Sakany, 2019), as it showed that the majority of participants aged 30 years and over are the most participants in this study for both the study group and the control group. And the results of the study (A. M. F. Hussein et al., 2016) as it confirmed that the majority of the participants were between ages of 30 years and less for each of the two groups (study and control). The results of our study showed that the study group and the control group were the same, not statistically calculated, because all paramedics participating in the study group and the control group are male only (100%) and there are no females in this study. This result is consistent with the results of the study (Salah M S. Hassan, PhD Hakima S. Hassan, 2013), where the majority of the participants in their study were male. The results of the current study differed from the results of study (A. M. F. Hussein et al., 2016), as the majority of the study participants are female .This is because of the habits and religious beliefs in Iraqi community that do not accept female work as paramedics in ambulances, in addition to some cases that require effort and strength to deal with them (Researcher). Educational level in the current study, the results in each of the two groups (study and control) showed that the majority of participating paramedics are graduates of the Nursing Institute, comparing the other educational levels . The results of this study were agreed with the results of the study, (Knowledge & Sakany, 2019),. as the results showed that the majority of the study participants are graduates of the Nursing Institute for each of the two groups (the study and the control). And the results of a study (H. A. Hussein & Hassan, 2019), as the results showed that graduates of Nursing Institute are the majority of the participating in both groups (the study and the control) . Regarding to years of experience in immediate ambulance, the results of our study showed that the majority of paramedics contributing to both groups (study and control) have experience of years ranging from 6-10 years. The results of the current study were agreed with the results of the study (Niazy & Health, 2013), as most study participants have experience of years (5-10) years. The results of the current study were agreed with the results of the study by (H. A. Hussein & Hassan, 2019), as the results recorded that the majority of the participants have experience of years that are less than (6-10) years .Participation in advanced courses for first aid, all paramedics participating in the current study participated in these courses for each of the two groups (study and control) and with different times . The results of the current study were agreed with the results of the study (Lafta & Mansour, 2017), in terms of participating in the training sessions for each of the two groups (the study and the control). And (H. A. Hussein & Hassan, 2019), the results of the study as the majority of the nurses participate in the training courses .The number of times participation in these training courses varied, but most of them participated several times for both the study group and the control group in the training courses. The results of the current study were agreed with the results of the study(Niazy & Health, 2013), since most of the study's participants participated in several training sessions. and (Knowledge & Sakany, 2019) the results of the study , as the study participants participated in these training courses.

All study groups (study and control) participated in training courses inside Iraq and did not participate in courses outside of Iraq. The results of the current study were agreed with the results of the study (Lafta & Mansour, 2017), as most of the study's groups participated in training courses inside Iraq only. And (Niazy & Health, 2013), the results of the study, most of participated in courses inside of Iraq.

Table (2) Statistical results showed that paramedics participating in the study reported a significant increase in their knowledge when comparing knowledge pre-testing and knowledge post-testing. By comparing the score of the knowledge test for the study group, presented highly significant differences of the knowledge (first and second parts) of the whole study sample between pre-test and post-test score at p value (0.000). Moreover, a high significant difference was also presented among the whole study sample pre-test and post-test practices at p value (0.000). This means the effectiveness of the educational program between the two periods (pre-test and post-test) of paramedics' knowledge and practice towards pre-hospital burn measures. These results have come along with the findings of the study of (H. A. Hussein & Hassan, 2019), the results confirmed that there is a great importance between the pre and post-test as general, the domain in the study group at  $P <0.001$ . Excluding the domain (practices) is significant different when analyzing t-test.

Table (3) The results showed that there were highly significant relationship between Socio-demographic variables of the study group with their first part of knowledge in post-test at (P.value =.002, .005, and .004) respectively .

These results have come along with the findings of the study of by (Niazy & Health, 2013) The results show that there is a significant relationship between nurses' knowledge about the interventions of a burned patient who works in the emergency unit and demographic variables (gender, educational level, years of experience, number of training sessions).

Table (4) The results show that there were highly significant relationship between age and years of experiences of the study group with their second part of knowledge in post-test at (P.value =.000, and .000) respectively. But there is no relationship between the educational level at P.value (0.42) .

The results of the study (Jabbar and Bachelor, 2015) showed that there was no statistically significant relationship between the nurse's knowledge in (pre-tests) and demographic data in the study group ( $p > 0.05$ ), while we did not find significant changes between the post-test and demographic information where it was found that there were A statistically significant relationship between the educational level ( $p < 0.05$ )

Table (5) showed that there was no statistically significant relationship between the effectiveness of the educational program on paramedic practices concerning pre-hospital burns management for adults in ambulances and their demographic characteristics at the post-test level.

These results came along with the results of the study, (Lafta & Mansour, 2017), where no significant differences were found between paramedic practice and demographic variables (age, years of experience, and number of courses), while significant differences were found between paramedic practice and the level of education of the study group

**Conclusion:** A there is significant effectiveness of educational program on paramedic knowledge and practice concerning pre-hospital burn management for adult at ambulance in Baghdad City.

**Recommendations:** Based on the conclusions, the study can recommend that:

Providing a guide ambulance kit prepared by the researcher to the ambulance caregivers that include information and practice regarding pre- hospital trauma care and adopting the program as a training bag in the ambulance and emergency, Approving the program training in the disaster and regional training center for Emergency Medicine

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