

Effectiveness of an Educational Program in Nurses' Knowledge toward Traumatic Head Injury during Golden Hour at Neurosurgical Hospital

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Abstract

Background: Globally, traumatic head injury higher mortality rate, and unpredictable outcome. Improvement of nurses' knowledge of how to deal with early periods of the traumatic head can improve patients outcomes.

Objectives: This study aims to assess the effectiveness of an educational program in nurses' knowledge toward traumatic head injury during golden hour.

Method: A quasi-experimental design was used in this study to assess 50 nurses' knowledge regarding constructed educational programs toward traumatic head injury during golden hour who works in critical care units in Neuro-surgical hospital. The measurement of the effectiveness of educational program through the nurses knowledge includes(54)items concern knowledge related Anatomy of the head and brain; Physiology of intracranial pressure(ICP),cerebral perefusion pressureCPP and blood pressure(BP); Primary and secondary survey; fluid supply; information about traumatic head injury during golden hour . Reliability of instrument was determined through the use of test and retest and the instrument validity was determined through a panel of experts.

Results: The study show a comparison significance association between study and control group during pre-test and post-test regarding overall assessment, there are improvements in study group knowledge level, the significant association for were $P= 0.000$. For the control group, there is no significant association between pretest and post-test $P= 0.733$ p-value >0.005 .

Conclusion: The study concludes the current educational program effectively and can improve nurses knowledge in critical care units and recommends to further study assess nurses practice regarding traumatic head injury during golden hour, Adopting an educational program for all nurses and more involved in continuous education lectures and workshops.

Keywords: Educational Program, Traumatic head injury, Nurse, Golden Hour.

Introduction

Traumatic brain injury is "a silent epidemic" because the problems result are often appears gradually after a long- period and invisible by the community^[1]. Because of the long term effects of head injury on cognition, intellectual, mental, emotional, psychosocial, and motor function, it is no optimal way to give the effect of acute and long term care for patients in developing countries^[2]. Effective health care depends on several factors include assessment of health care programs, specificity nurses'

education needs, and work in a multi-disciplinary team. Many pieces of literature over decade high lightened the gap in education and trauma management needs, so this gap produces the development, tailored, and construct educational materials, each one objective to a specific aspect of trauma care^[3,4,5,6,7]. On the other hand, many researchers tend to fill the knowledge gap among nurses through exploring their needs, develops educational tools, construct programs not only to solve current problems but to keep quality of education inside

the hospital and update the information regarding best available evidence^[7,8,9,10]. Also, literature discussed the factors that can effects patients outcomes after traumatic brain injury, one of these factors is how the patients managed at injury moment and the definite care did not include only at the scene of injury, may continue at a hospital^[11,4]. Brain trauma foundation is developer sound of traumatic head injury guidelines over 30 years report and recent literature reports, the knowledge for early management for patients with traumatic head injury focus on the primary assessment where identify the patient priority of the problems, hemodynamic stability and monitoring such as oxygen saturation, blood pressure and mean arterial pressure, use of appropriate intravenous fluid, positioning and use of intervention to avoid complications^[12,13,14,15]. However, patient survival after traumatic head injury depends on focused management to prevent primary injury development to secondary injury^[14]. Because there is no policy or procedure focused on traumatic head injury during golden hour, then the education program constructed to fill this gap in patients' care and promote nurses' knowledge about head injury during this period.

Material and Methods

Design: A quasi-experimental design was used in this study to assess the effectiveness of an educational program toward traumatic head injury during golden hour at the neuro-surgical hospital in Baghdad city pre and post.

Ethical Approval: This study was approved by the Institutional Ethics Committee, and The IRB was obtained from the University of Baghdad and the Ministry of Health, Directorate of Al Rusafaa Health Administration in Baghdad city.

Study sample: a non probability purposive sample consists of 50 male and female nurses for both (study and control groups) in the emergency and ICU in selected hospitals.

Instrument: Study instrument constructed by the researcher based on comprehensive literature, standard nursing textbook, and consist of two parts:

Part I: Assessment needs questionnaire was used to assess nurses' knowledge needs regarding traumatic

head injury during golden hour.

Part II: Pre/Post-test knowledge questionnaire: to assess nurses' knowledge about traumatic head injury during golden hour, in addition to their socio-demographic data. Scoring system used for multiple-choice questions, each question had four answers, one answer is correct and three answers are incorrect. Scoring include: (0= false answer,1=true answer).The level of assessment was (0.00-0.33=poor, 0.34-0.67=fair, 0.68-1.00=good).

Data Analysis: Social package for social sciences (SPSS) version 24 was used for data analysis, descriptive statistics such as frequency, percentage, mean of scores and standard deviation, inferential statistics include: Paired t-test to evaluate changes of nurses knowledge.

Findings

Current findings show the demographic characteristics for study and control groups. Table (1) shows that the distribution of age indicated that the majority of study group nurses' ages were (20-24) years old who were accounted for (64 %), control group nurses ages were (30-34) years old were account (44%). Related to gender, most of the study sample was female gender account (80%) and the Control sample dominantly female was (64%). The majority of the Study sample were married (52%) also tow –third study Control sample was married (76%). According to Educational status, most of the Study group was graduated from secondary-school nursing (84%) and the control group was (76%). Regarding the shift of work, the day shift was dominantly (88%) of the Study group and the night shift (84%) of the Control group. The majority of the study group were their work field was at ICU accounts (64%) and two-thirds of the Control group also were in ICU accounts (76%). Related years of experience in the current workplace (52%) of the Study sample were less than three years and the Control group were (44%) between three to six years. Total years of employment in nursing, the study group (36%) total years of experience between (9-12) years and control group was (32%) of the study sample between (13-16) years. Regarding participation in the training course in continuous education inside the hospital the majority of the study group was (52%) reported (yes) they attend in continuous training lectures or training course and

(80%) reported (no).

Table (2) shows the majority of the study group in pre-test phase (52%) of nurses was poor knowledge with mean of the score (0.40) and standard deviation (0.169) and more than half of control group (52%) was fair knowledge and their mean of the score was (0.38) and standard deviation (0.135). The table also shows control group in post-test phase, were good improvement in nurse’s knowledge, majority recorded good knowledge (68%) and their mean of the score was (0.73) and standard deviation (0.096) and more than half of control group was fair knowledge(52%) and their mean of the score was (0.36) and the standard deviation was (0.133).

Tables 3 and 4 show the Comparison significance of Nurses’ knowledge Between (Pre-Test and Post-

Test) for Study and control group Regarding domains of Educational Program questions. Study group pre-post-period was statistical significance (<0.005) in all domains (Anatomy of the head and brain, physiology of ICP, CPP and BP, Primary survey, fluid supply, and information about traumatic head injury during golden hour). In comparison with the control group, the program promotes study nurses’ knowledge and effectiveness.

Table (5) This table shows a comparison significance association between study and control group during pre-test and post-test regarding overall assessment, there are improvements in the study group knowledge level, the significant association for were P= 0.000. For the control group, there is no significant association between pretest and post-test P= 0.733 p-value >0.005.

Table (1): frequencies and percentages of demographic characteristics of the studied sample:

Variables		Study Group		Control Group	
		F	%	F	%
Age groups	(20-24)	16	64.0	4	16.0
	(25-29)	4	16.0	6	24.0
	(30 -34)	1	4.0	11	44.0
	(35-39)	4	16.0	3	12.0
	≥40			1	4.0
		25.1± 6.77		35.3± 5.004	
Gender	Male	5	20.0	9	36.0
	Female	20	80.0	16	64.0
Marital Status	Single	12	48.0	5	20.0
	Married	13	52.0	19	76.0
	Divorced	-	-	1	4.0
Educational status	Secondary school nursing	21	84.0	19	76.0
	Diploma	3	12.0	5	20.0
	Bachelor	1	4.0	1	4.0
Years of Experience in the current place	Less than 3 years	13	52.0	5	20.0
	3-6years	6	24.0	11	44.0
	More than 6 years	6	24.0	9	36.0
Total years of employment in nursing	(1-4)	4	16.0	-	-
	(5-8)	4	16.0	5	20.0
	(9-12)	9	36.0	4	16.0
	(13-16)	4	16.0	8	32.0
	(17 -20)	4	16.0	7	28.0
Work Field	ER	9	36.0	6	24.0
	ICU	16	64.0	19	76.0
Participation in continuous education lecture	Yes	13	52.0	5	20.0
	No	12	48.0	20	80.0
Shift	Day	22	88.0	-	-
	Night	3	12	4	16.0
	Noon	-	-	21	84.0

MS= Mean score; SD=standard deviation

Table (2): Level of Assessment of Nurses Knowledge toward Traumatic Head Injury during Golden Hour, for Study and Control Group Pre-test and Post-test:

Period	Level of Assessment	Study Group		Control Group	
		F	%	F	%
Pre-Test	Poor: (0.00-0.33)	13	52.0	11	44.0
	Fair: (0.34-0.67)	8	32.0	13	52.0
	Good: (0.68-1.00)	4	16.0	1	4.0
	Total	25	100.0	25	100.0
		0.40 ± 0.235		0.36 ± 0.135	
Post- Test	Poor: (0.00-0.33)	0	0	10	40.0
	Fair: (0.34-0.67)	8	32.0	13	52.0
	Good: (0.68-1.00)	17	68.0	2	8.0
	Total	25	100.0	25	100.0
		0.73± 0.112		0.37 ± 0.133	

F= frequency; %= Percentage; ±= mean of score and standard deviation.

Table (3) Mean scores of total and subtotal knowledge of ICU nurses regarding traumatic head injury during golden hour pre-test and post-test period for study group:

Knowledge domains	Pre-test MS±SD	Post-test MS±SD	t-test	Sig*
Anatomy of the Head and Brain	0.52 ±(0.199)	0.76 ±(0.137)	5.059	0.000
Physiology of ICP, CPP, and BP.	0.37± (0.185)	0.71± (0.096)	9.798	0.000
Primary and Secondary Survey	0.46± (0.272)	0.74± (0.100)	5.346	0.000
Fluid Supply	0.36± (0.264)	0.71± (0.116)	6.322	0.000
Information about the golden hour	0.37± (0.255)	0.74± (0.112)	7.502	0.000
Total Knowledge	0.42± (0.235)	0.73 (0.112)	6.8054	S

MS= Mean of score; SD=standard deviation; S= Significance P value ≤0.005

Table (4) Mean scores of total and subtotal of Nurses knowledge regarding traumatic head injury during golden hour pre-test and post-test period for the control group:

Knowledge domains	Pre-test MS±SD	Post-test MS±SD	t-test	Sig*
Anatomy of the Head and Brain	0.48 ±(0.197)	0.49 ±(0.132)	.238	0.814
Physiology of ICP, CPP and BP.	0.28 ±(0.162)	0.31±(0.120)	.866	0.395
Primary and Secondary Survey	0.45 ± (0.166)	0.43 ±(0.191)	-.436-	0.666
Fluid Supply	0.32 ±(0.211)	0.30 ±(0.219)	-.398-	0.694
Information about golden hour	0.30 ±(0.168)	0.32 ± (0.197)	.595	0.558
Total Knowledge	0.36± (0.181)	0.37± (0.172)	0.566	NS*

Table (5): Significance association between study and control group regarding period:

Groups	Period	MS	SD	df	t	Sig.
Study	Pre-test	0.40	0.169	24	10.424	0.000*
	Post-test	0.73	0.97			
Control	Pre-test	0.36	0.110	24	0.345	0.733
	Post-test	0.37	0.090			

MS= Mean of score; SD=standard deviation; S= Significance P value ≤0.005*

Discussion

The current study shows fifty study sample, despite the level of assessment are equal between study and control group regarding pre-test period were poor (52%) The majority of the nurses in this study group (68%) had good knowledge in the post-test period, Also these results have a significant correlation for study group pre/post- test (t=10.424, p=0.000). The control group has no changes in their level of knowledge in the post-test period and have no significant correlation between pre/post- test period (t=0.345, p=0.733). The most striking result to emerge from this data is the educational program improves nurses’ educational status to be good regarding the level of assessment. This result agrees with the study done by Masakare and Masakare (2015) in their quasi-

experimental study to assess the nursing education program’s effectiveness in nurses’ knowledge about the management of acute head injury [3]. Regarding the knowledge domains The current study found the study group had a fair level of knowledge in pretest period regarding the anatomy of the head and brain mean of scores (0.52), and physiology of blood pressure(BP), intracranial pressure (ICP) and cerebral perfusion pressure(CPP) mean of the score was (0.37). This result agrees with Montayre & Sparks, (2017) they confirmed the necessity of anatomy and physiology for nurses student as a body of knowledge and inconsistent with (Mousa,2015) were found in his study the nurses have a high level of knowledge in anatomy and physiology in critical care unit^[3,16,17]. This reflects the importance

of anatomy and physiology, so the obligatory courses in all nursing education programs. The findings of the current study, indicate a significant correlation in the study group between pre-test a post-test p-value (0.000) regarding the primary and secondary survey table (3). The primary and secondary survey is important for trauma care in general and especially for a traumatic head injury, all steps of primary survey important in life-saving, the primary survey is main steps of advanced life support (ATLS), this supported by Mohammad and their colleagues (2014) in their systemic review study, highly recommends impact of educational and clinical ATLS courses in decrease mortality rate in the management of the traumatic patient[18]. The fluid supply domain was record mean of the score (0.36) in the pretest period and improved in the post-test period, mean of the score(0.71), and p-value (0.000). Finally, information about the golden hour domain mean of the score (0.37) in the pre-test period and improved to (0.74) in the post-test period and p-value (0.000), table (3). The study group has a significant correlation between pre-test for all domains in contrast with the post-test, While the control group in all domains has no significant correlation between pre-test and post-test periods, table (4). These findings consistent with Seliman et al. (2014), found the pre-test has a significant correlation with post-test and improved critical care nurses' knowledge. Also, agree with the study done by Shehab et al. (2018) were found because of lack of continuous education follow up and protocols for nursing management the nurses have a low level of knowledge before their educational program applied and significance correlation after utilization of the educational program^[5,15].

Conclusion

The study concludes the current educational program effective and can improve nurses knowledge in neurosurgical critical care units and recommends to further study assess nurses practice regarding traumatic head injury during golden hour, Adopting an educational program use to assess their practice necessary for all nurses, also involved in continuous education lectures seminars and workshops.

Conclusion

Financial disclosure

There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Adult of Nursing Department College of Nursing and all experiments were carried out in accordance with approved guidelines.

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