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Effectiveness of an Educational Program on Nurse's Knowledge and Practices Regarding Assessment and Care Management for Wounds at Intensive Care Unit and Surgical Wards in General Kirkuk Hospital

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Abstract: Objective(s): This study aims to evaluate the effectiveness of an educational program on surgical nurse's knowledge regarding assessment and care management for wounds at intensive care unit and surgical wards in general Kirkuk hospital, and to find out the relationships between nurse's knowledge and practices and their socio-demographic characteristics (age, gender, level of education, years of experience in nursing, years of experience in intensive care unit or surgical wards, and participation in training session). **Methodology:** A quasi-experimental design (descriptive study) used to guide this study, it was conducted by use of pre-post test approach for two groups of samples (case and control) during the period 15th of November, 2019 to 19th of April, 2020. A non-probability (purposive) sampling has been performed during a selection of (60) nurses who works in the intensive care unit and surgical wards in general Kirkuk hospital were divided into two groups; (30) nurses as a case group who were exposed to the educational program and (30) nurses who are not exposed to the educational program considered as a control group. In order to reach the aims of the study, the researcher constructed program and questionnaire and observational checklist format to assess the nurses` knowledge and practices, the questionnaire format was composed of the five domains(50) questions and observational checklist to assess nurses` practices was composed of five domains (51) items. The validity of the program and instrument was determined by presenting it to (23) specialist experts and reliability of the instruments was determined through (test-retest) approach for knowledge test, while the reliability of observational checklist was determined through the inter and intra-examiner. The data analyzed through the use of a descriptive and inferential statistics in order to discover the differences between the case and control groups. **Result:** The findings of the current study revealed that there are highly statistically significant differences in post test between case and control groups in all knowledge parts and practice domains at P equal or less than 0.001. The findings also show that there is a statistical association between nurses` knowledge and their educational qualification, while the results show there is no statistically association between nurses` practices and their demographic characteristics. **Conclusion:** The study concluded that the effectiveness of an educational program on nurses knowledge and practices regarding assessment and care management of wounds is positive at a high rate. **Recommendations:** Based on the findings of current study the researcher recommended that the educational and training programs should be conducteed periodically for nurses, also should provide the tools and chart that specially used to assess wound in a general and pressure ulcer in a particular in all surgical wards and units in order to enhance the level of their knowledge and to achieve optimal practices regarding assessment and care management for wounds, the researcher also recommended the necessity of conducting more research studies in other provinces of Iraq.
Keywords: Educational Program, Knowledge, Practice, Wound Assessment, Wound Care Management.

I. INTRODUCTION:

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Every year, millions of people everywhere in the world experience both acute and chronic wounds and annually about 37 million of persons suffer from chronic wounds. This not only influence the quality of life for the patient, but also affect the financial status of the country.[1]

Various types of wounds are a major cause of morbidity and impaired quality of life, and considered as an essential risk factor for hospitalization, amputation, sepsis, and even death.[2]

The commonly encountered clinical responsibility for nurses in many healthcare settings and is primarily intended to describe the state of a wound at a given point in time is a wound assessment. Perfect assessment is required to determine the wound phase, the dressing required, and if a wound is cured or getting poorer. If the wound is not exactly assessed, will result in delayed healing, increase cost for the patient and health care setting and additional increase the time requires for nursing care.[3]

Wound care management is defined as a dynamic, complex procedure that needs special knowledge of the nursing team, including health care providers who developed this knowledge in both prevention of complication and in enhance wound care management. Wound care management is considered one of the basic pillars of patient care at all levels of health service. Also stated the wound assessment is considered as a means to attain ideal wound care management. Wound care management aim to optimal functional result without any complication. The economic burden on health service in relation to wound care management as a result of prolonged stay in the hospital, and the cost required for wound care.[4][5]

The major clinical challenges in the world and a gold standard in wound care management is a wound healing, that can be defined as a complicated pathophysiological process that requires a desirable environment (moist environment) It is a healthy response to tissue injury relies on a systematic cascadeof events consisted of four consecutive phases that are different in function and histological characteristics, include the hemostasis phase (involving blood coagulation), the inflammatory phase (the wound is debrided of foreign material), the proliferation phase (granulation tissue forms and the wound close), and remodelling phase improving the tensile strength of the wound.[6] To enhance patient outcomes and reducing costs of care, accurate wounds assessment and documentation of wound assessment, along with appropriate interventions should be performed. Wound assessment is an essential element of wound care, the nurse should perform accurately wound assessment that can lead to making the correct diagnosis, make dressing decision based on what is visible in the wound, appropriate treatment, and discharge of patients.[7][8][9]

Every health care provider should understand and update their skills and knowledge to enable the assessment of wounds accurately and timely. Several studies have suggested that nurses unable to appropriately assess wounds and do not always provide optimal care will result in an increase in time for the wounds to heal, discomfort for the patient, increased risk of infection, inappropriate use of wound dressings, and a reduction in quality of patient life.[10]

Wound assessment is an essential in preventing complications and in limiting morbidity and mortality. It is primarily a nursing responsibility, involves assessing and documenting changes in wound exudates (color, odor, and amount), signs of wound infection, loss of previously healed skin, and all other wounds assessment parameters.[11]

Estimated that between 25% and 50% of critical hospital beds are occupied by patients suffering from a wound, and about 55%-60% of these wounds are non-healing wounds, infected surgical wounds, pressure ulcers and leg/foot ulcers. Also, its estimated that more than 23% of all patients admitted to the hospital have a pressure ulcer, many of which are acquired during hospitalization for a critical period of disease or injury. The prevalence and incidence of non healing wounds (acute and chronic) are a chief source of morbidity to patients and a main source to costing for hospital and community health care providers universally.[12]

A cross-sectional study of the descriptive nature conducted in a university hospital in the city of Vitória, Brazil. They indicated that the majority of nurses present with insufficient knowledge regarding the care of wounds. Therefore, the researcher recommended to guiding the strategies for protocol construction to care for wounds and for the formation of a curative commission that will assist in enhancing the wounds assessment and wounds care management.[5]

A study conducted in Mosul Teaching Hospitals regarding nurses' knowledge post-operative wound care, the current study revealed that the nurses in the case group have benefited from the implementation of the health education program. Based on the analysis of the results, they recommended the necessity of developing a continuous, periodic educational and training programs for all surgical nurses to enhance their ability in dealing with the wound to enhance the quality of care.[13]

From the previous studies, the researcher concluded that the nurses should receive continuing educational and training program to prevent further srious consequences, shortened hospital stay, and reducing costs of care, and also the researcher ought to design the present study, becouse there is a pressing need to construct of nursing educational program for nurses inintensive care unit and surgical wards, also the researcher believes that the findings of the study may add something to broaden nursing knowledge particularly, in adults' nursing. (researcher)

II. METHODOLOGY

Design of the Study: A quasi-experimental design (descriptive study) used to guide this study, it was applied by use of pre-post test approach, from the period 15th of November, 2019 to 19th of April, 2020.

Setting of the Study: The study was conducted at Intensive Care Unit and Surgical Wards in General Kirkuk Hospital.

A sample of the Study: A purpusive (Non-probability) sampling has been performed for all nursing staff who works in the intensive care unit and surgical wards, the total number of nurses who participated in the study was (60), nurses was divided into two groups; (30) nurses as a case group and they are exposed to the educational program and (30) nurses who are not exposed to the educational program considered as a control group, the two groups have approximately the same demographic characteristics.

Instrument: To evaluate the effectiveness of the educational program the researcher constructed a questionnaire format and observational checklist in order to reach the aims of the study. The instrument consists of (3) partition:

Part 1:Self-administered questionnaire sheet related to demographic characteristics of the nurses. This part is concerned with the collection of basic socio-demographic data obtained from the nurse's by the interview questionnaire sheet that involved (age, gender, marital status, level of qualification, years of experience in nursing, years of experience in the intensive care unit or surgical wards, training courses regarding wound assessment and training courses regarding wounds care management).

Part II: Self-Administered Questionnaire Sheet Related to Nurses' Knowledge Regarding Assessment and Care Management for wounds.

The questionnaire constructed to assess nurses" knowledge regarding assessment and care management for wounds. It comprises (50) multiple-choice and close-ended questions that include (3) parts:

1. **First part:** Nurses" knowledge regarding the general concepts of wound assessment. This part has consisted of (10) multiple choice questions.
2. **Second part:** nurses` knowledge regarding wound care management this part consists of three domains involves:

❖ **First domain:** Nurses" knowledge relative to select the appropriate type of dressing during the care of wounds. This domain has consisted of (10) multiple- choice questions.

❖ **Second domain:** Nurses" knowledge related to preparing for the dressing procedure. This domain has consisted of (5) close-ended questions.

❖ **Third domain:** Nurses" knowledge during wounds care management (dressing). This domain has consisted of (15) multiple choice questions.

3. **Third part:** Nurses" knowledge relative to sterile technique and prevention of wound infection.This part has consisted of (10) multiple- choice questions.

Part III: Observational checklist about nurses' practices regarding assessment and care management for wounds.

The observational checklist consisted of (51) responses distributed into three parts that include:

1. First part: Nurse's practices regarding patient identification and equipment preparation. This part was consisted of (3) items.

2. Second part: Nurse's practices regarding assessment and care management for wounds. This part consisted of the four domains:

❖ **First domain**: Nurse's practices regarding wound assessment and care management, this domain consisted of (11) items.

❖ **Second domain:** Nurse's practices regarding wounds care management. This domain consisted of (20) items.

❖ **Third domain:** Pressure ulcer assessment, the researcher structured all items regarding pressure ulcer assessment based on the Pressure Ulcer Scale for Healing (PUSH Tool), this domain composed of (7) items.

❖ **Fourth domain:** Pressure ulcer care management, this domain composed of (5) items.

3. Third part: Nurse's practices regarding instruct patients with wounds (patient instruction), this part consisted of (5) items.

Reliability of the Knowledge and practice Items: The reliability of the questionnaire is determined through the use of test and re-test approach, The results of the reliability revealed that the Pearson correlation coefficient is (r= 0.884), whereas the reliability of the observational checklist through determine a consistent grade between the researcher (intra examiner) and expert (inter examiner) based on the Pearson correlation coefficient value is 0.78 this result shows that there is an acceptable level reliability value for all included items in the checklist.

Statistical Methods: Data have been analyzed through the use of Statistical Package for Social Science (SPSS version 21 application).

III. RESULT:

Table (1) Distribution of the participants (Case and Control) according to Demographic Characteristics.

Demographic Characteristics	Subgroups	Case group: No.= 30		Control group: No.= 30		C.S. and P. Value
		f.	%	*f.*	%	
	20 - 25 Years	9	30	9	30	$\chi 2$

Age Groups	26 - 30 Years	10	33.3	9	30	0.427 N.S
	31 - 35 Years	7	23.3	8	26.6	
	36 – 40 Years	2	6.7	2	6.7	
	41 – 45 Years	2	6.7	2	6.7	
	Total	30	100	30	100	
Gender	Male	15	50	14	46.7	FPT 0.358 N.S
	Female	15	50	16	53.3	
	Total	30	100	30	100	
Marital Status	Married	17	56.7	15	50	$\chi 2$ 0.385 N.S
	Single	12	40	13	43.3	
	Divorce	1	3.3	2	6.7	
	Total	30	100	30	100	
Educational Level	Preparatory Nursing School	12	40	11	36.7	$\chi 2$ 0.168 N.S
	Nursing Institute	9	30	9	30	
	Nursing Collage & Higher	9	30	10	33.3	
	Total	30	100	30	100	

f.: Frequency, No.: Number, %: Percentage, &: and, +: plus, $\chi 2$ = Chi-Square test, FPT= Fisher Exact Probability Test, C.S. = Comparison Significant, N.S = Non-Significant at P >0.05.

Table (1) reveals the frequency count for selected demographic characteristics of two groups (case versus control) were equal in number, less than thirty years old was accounted for (n=19; 66.3% and n=18; 60%) respectively. According to gender the two groups (control versus case) were equal in number, that accounted (n=15; 50%) for the case group and (n=16; 53.3%) for the control group. Regarding to the marital status (n=17; 56.7%) of the nurses in the case group were married and the (n=15; 50%), in the control group was married also. A high percentage of the ICU and surgical ward nurses (n=12; 40%) in the case group and (n=11; 36.7%) in the control group are graduating from preparatory nursing school, followed by nursing institute and nursing collage. There are no statistical significant differences were observed with regard to age group,gender, marital status, and level of education between tow groups at (p>0.05) when analyzed by chi-square test fisher exact probability test.

Table (2): Distribution of the Study and the Control group, according to General in Nursing Experience and ICU Experience Years, and training scession of the study and the control groups.

Demographic Characteristics	Subgroups	Case group: No.= 30		Control group: No.= 30		C.S. and P. Value
		f.	%	*f.*	%	
General year of Experience in nursing	Less than 5 Years	14	46.7	13	43.3	$\chi 2$ 0.380 N.S
	6-10 Years	12	40	12	40	
	11-15 Years	2	6.7	2	6.7	
	16-20 Years	1	3.3	2	6.7	
	21-25 Years	1	3.3	1	3.3	
	Total	30	100	30	100	
Years of Experience In ICU or Surgical Wards	≤ 5 Years	28	93.4	27	90	$\chi 2$ 0.795 N.S
	6-10 Years	1	3.3	2	6.7	
	11 - 15	1	3.3	1	3.3	
	Total	30	100	30	100	
Participating in Wound Assessment Training	Participated	1	3.3	1	3.3	FPT 0.063 N.S
	Not Participated	29	96.7	29	96.7	
	Total	30	100	30	100	
Participating in Wound are Management Training	Participated	19	63.4	20	66.7	FPT 0.071
	Not Participated	11	36.6	10	33.3	

	Total	**30**	**100**	**30**	**100**	**N.S**

f.: Frequency, ICU: Intensive Care Unit, no.: Number, %: Percentage, +: plus, ≤: Less than an equal.χ2 = Chi-Square test, FPT= Fisher Exact Probability Test, C.S. = Comparison Significant, N.S = Non Significant at P >0.05.

Table (2) shows that a high percentage of ICU and surgical nurses (n=14; 46.7%) in the case group and (n=13; 43.3%) in the control group, the general year of experience in nursing were ≤ 5 years, The similar percentage (40%) of nurses in the case and the control group was (6-10) years of experience in general nursing. The majority of the sample (n=28; 93.4%) in the case group and (n=27; 90%) of the control group were work their experience in Intensive care unit (ICU) and surgical ward were ≤ 5 years. Concerning the nurses who participating in wound assessment training sessions, a majority (n=29; 96.7%) of the case group and the control group are not participating. A high percentage of the nurses in the study group (n=19; 63.4%) and the control group (n=20; 66.7%) were participating in wound care management training sessions. There are no statistical significant differences founded between the (case and control) related all variables

Table (3) Comparison between Nurses Knowledge in the study and control group for Pre and Posttest

nowledge parts	Nurses Knowledge domains	roups	Pre n=30		Post n=30		t- test	P.value	Sig.
			Mean	S.D	Mean	S.D			
First art	General Concepts of Wounds Assessment	St	12.00	1.25	18.90	1.02	29.164	000	H.S
		Co	11.93	1.33	11.60	1.10	3.340	002	S
Second part	Selection of Appropriate Type of Dressing	St	12.37	99	18.53	90	22.707	000	H.S
		Co	12.87	1.65	12.67	1.47	1.989	056	N.S
	Preparing for the Dressing Procedure	St	6.87	86	9.50	63	14.432	000	H.S
		Co	7.57	85	7.70	83	2.112	043	N.S
	During and Post Wound Care (Dressing)	St	18.87	1.69	27.37	1.40	21.699	000	H.S
		Co	19.13	2.11	19.33	1.84	1.533	136	N.S
Third part	Sterile Technique and Prevention of Wound Infection	St	12.87	86	18.00	1.08	24.736	000	H.S
		Co	12.70	1.17	12.87	1.22	1.000	326	N.S

n: number, SD: standard deviation,st=study group, co=control group, t-test= Paired Samples t- test, d.f: degree of freedom=29, Sig.: Significance, N.S: Non-Significant at p>0.05, S: Significant at p<0.05, H.S: high Significant at p<0.001.

Table (3) shows that the higher statistically significant differences between pre and post-test of all knowledge domains for the study group, while shows that there are no statistically significant differences between pre and post-test of all knowledge domains except (General Concepts of Wounds Assessment) for the control group at P equal or less than 0.05 when analyzed by paired-sample t-test.

Table (4) Comparison between Nurses Practices in study and Control Group for the Pre and Posttest.

Practices parts	Nurses Practices domains	Groups	Pre n=30		Post n=30		t- test	P.value	Sig.
			M.S	S.D	Mean	S.D			
First part	Patient Identification and Equipment Preparation (General Nurses Peactices)	St	4.07	1.20	7.07	1.38	9.327	.000	H.S
		Co	4.43	1.30	4.40	1.22	.297	.769	N.S
econd part	Wounds Assessment	St	21.10	1.24	49.20	3.35	48.446	.000	H.S
		Co	20.80	1.29	21.10	1.62	1.469	.153	N.S
	Wounds Care Management	St	37.30	3.78	71.87	1.63	48.752	.000	H.S
		Co	36.87	3.88	36.67	3.32	711	.483	N.S
Third part	Patients Instruction	St	5.27	.450	13.17	1.23	33.390	.000	H.S
		Co	5.37	.490	5.37	.556	.000	1.000	N.S

n: number, M.S: Mean of score, SD: Standard deviation, t-test= Independent Samples Test, d.f: degree of freedom=29, Sig.: Significance, N.S: Nonsignificant at p>0.05, S: Significant at p<0.05, H.S: high Significant at p<0.001.

Table (4) shows that the higher statistically significant differences between pre and post-test of all practices domains for study group at P equal or less than 0.001, and also shows that there are no significant differences between pre and post-test of all practices domains in the control group at P equal or less than 0.05 when analyzed by paired-sample t-test.

Table (5) Association Between demographic charactristics with Nurses Knowledge and Practices for The Study Group at Post-Test

Socio-demographic variables	Knowledge level			Practice level		
	Statistical test	P value	Sig.*	Statistical test	P value	Sig.
Age groups	**F**=.074	.989	**N.S**	F=.661	.625	N.S
Gender	**t**= -.299	.767	**N.S**	t=-.062	.951	N.S
Marital status	**F**=1.446	.253	N.S	F=.186	.831	N.S
Educational level	**F**=4.503	.021	S	F=1.733	.196	N.S
General Years of Experience	**F**= 584	.737	**N.S**	**F**=.898	.480	N.S
Years of Experience in ICU or Surgical Wards	**F**=584	.565	**N.S**	**F**=.567	.574	N.S
Training session in Wound Assessment	**t**=-.433	.668	**N.S**	**t**=-.062	.951	N.S
Training Session in Wound Care Management	**t**=.285	.778	**N.S**	t=.407	.687	N.S

All variable statistic by ANOVA: analysis of variance except gender,training session in wound assessment and wound management by t-test= Independent sample test , No:number, SD: standard deviation, d.f = degree of Freedomfor F= 29 and t-test=28, Significant level at p-value ≤ 0.05, N.S: non-significant, S: significant.

Table (5) shows that there is no significant association between nurses knowledge and their demographic characteristics (age, gender, marital status, general years of employment, years of employment in ICU or surgical wards, training session in wound assessment, and training session in wound care management) except (educational level) that shows there is statistical significant association with nurses knowledge for a case group, this table also shows shows that there is no significant association between nurses' practices and their demographic characteristics (age, gender, marital status, educational level, general years of employment, years of employment in ICU or surgical wards, training session in wound assessment, and training session in wound care management) at post-test when analyzed by the one way ANOVA and independent sample t-test.) for a case group at post-test when analyzed by one way ANOVA and independent sample t-test.

Discussion of Demographic Characteristics of Nurses in the Intensive Care Unit and Surgical Wards for study and control groups (Table 1; Table 2):

Through the data analysis distribution of demographic variables, the percentage distribution of participants with reference to age groups reveal that the majority (n=15; 50%); (n=16; 53.3%) for the study and control group respectively were female, also reveals the high percentage (n=19; 63.3%) of the nurses in the study group and (n=18; 60.0 %) in the control group are within the age group (26-30) years, These results are consistent with the study conducted in university hospital in the city of Vitória (ES), Brazil by (De faria et al., 2016) who reported the majority of participants were female, and the majority of them (participants) within the age group (26-30) years, for the study and the control group. Moreover, this finding was consistent with the study conducted in Iraq, Baghdad city to evaluate the nurses' practices toward postoperative wound dressing in surgical wards, the study reported that the majority (74.5%) of participants were male and the (40%) of the participants more than 50 years old. [14]

In terms of their marital status, the findings of the present study reveal more than half (n=17; 56.7%) of the study and half (n=15; 50%) of the control group were married. This result consistent with the study conducted at Al-Sadder Medical City in Al-Najaf Al-Ashraf, amid to determine effectiveness of educational programs on nurses' knowledge regarding pre and post-operative nursing management, which found a high percentage (n=13; 65 %) of the nurses in the study group and (n= 11; 55%) for the control group were married.[15]

This finding also is consistent with the outcomes from the study done in Jordan regarding Jordanian nurses' knowledge of preventing surgical site infections in acute care settings, which reported more than half of participants (n=108; 54%) were married. [16] While the result disagrees with the study performed in Pakistan to assess nurses' knowledge and practice regarding prevention of surgical site infection, a study reported more than half (n= 69; 52.7%) of nurses were single. [17]

Percentage distribution of samples with reference to the level of education reveals about (n=12; 40%); (n=11; 36 %) of the study and control groups, respectively, had up preparatory nursing graduate, this result is concordant with the study conducted , which reported most of the participants (52.7%) were secondary nursing school graduate. [14] Also, this study congruent with another study conducted at Mosul hospitals in Iraq, the findings of the study revealed that the majority of participants were preparatory nursing graduates.[18] While this result is inconsistent with a study performed in Erbil City

aimed to assess wound dressing practice among nurses, which revealed that the highest percentage (n=53; 82%) of participants (nurses) were having a diploma in nursing.[19]

Concerning the years of experience in nursing services, the result of the current study indicated that the high percentage (n=14; 46%); (n=13; 43.3%) of the study and control group respectively, had less than five years of experience in nursing. This result is concordant with the study conducted to determine the impact of health education program upon nurses' knowledge towards postoperative wounds care in Mosul teaching hospitals, that reported the highest percentage(40%); (36.7%) of the study and control groups respectively, had less than five years of experience in nursing.[13] While this result inconsistent with a study revealed that the highest percentage of participants (n=15; 27.3%) have more than 26 years of experience.[14]

Percentage distribution of samples with reference to years of experience in the Intensive care unit (ICU) and surgical wards reveals the majority (n=28; 93.4%); (n=27; 90%) of the study and control groups, respectively, have less than five years of experience, this result concordant with the study conducted in the surgical wards, and intensive care unit in the province of Kayseri in Turkey, which revealed that the highest percentage (n=147; 47.2%) of participants have less than five years of experience in surgical wards.[20] While this result inconsistent with study conducted in Baghdad a study was aimed to evaluate of nurses' practices toward postoperative wound dressing in surgical wards, which revealed that the the highest percentage (43.6%) of participants having (6-10) years of experience in surgical wards. [14]

In the term of participating in wounds assessment, training, the results of the current study reveal the majority (n=29; 96%) of participants for the study and control group had no training course regarding wound assessment, while according to receiving education regarding wound care, the findings of the present study reveals the high percentage (n=19; 63.4%) of participants in the study group and (n=20; 66.7%) in the control group were have participated in wound management training. This result is consistent with the study conducted in the surgical wards, and intensive care unit in Turkey, which reported the highest percentage (62%) of participants received education regarding wound healing.[20] Also, this study concordant with another study, regarding nurses` knowledge about the dressing process in surgical wards in Mosul hospitals, which reported the highest percentage (n=78; 55.7%) of participants enrollment in the training session.[18]

Discussion the Comparison of Nurses Knowledge Concerning Assessment and Care Management of Wounds for the Study and Control Groups in pre and post test

A highly statistically significant differences in the case group between the pre and post test at all knowledge domains at P equal or less than 0.001, while there are no statistical significant differences in the control group between the pre and post test of all knowledge domains except (general concepts of wound assessment) at P equal or less than 0.05 when analyzed by Paired Sample t-test.

This results consistent with the study conducted to determine the impact of health education program upon nurses' knowledge towards postoperative wounds care in Mosul teaching hospitals, who indicated that there was a high level of knowledge (high statistical significance) for nurses in case group after exposed to the educational program. [13]

Discussion the Comparison of the Case and Control Groups related Assessment and Care Management of Wounds of Nurses Practices in Pre and Post test

A highly statistically significant differences in the case group between the pre and post periods at all practice domains at P equal or less than 0.001, while there are no statistical significant differences between the pre and post test periods for the control group at P equal or less than 0.05, when analyzed by paired sample t-test.

This result supported by the study conducted in Egypt , the study reported Pretest and posttest was used to assess and evaluate nurses' practices pre and post implementation of wound infection control guidelines, and where data analyzed the result of the study revealed there was a highly statistically significant differences between pre and post operative practices in all practices score at p-value < .001 after implementation of wound infection control guidelines.[21]

Discussion Association Between demographic characteristics with Nurses Knowledge and practices for The Study Group at Post-Test

Recarding the association between nurses knowledge and their socio-demographic characteristic; the result of the present study indicates that there is no significant association between nurses knowledge and their demographic characteristics (age, gender, marital status, general years of employment, years of employment in ICU or surgical wards, training session in wound assessment, and training session in wound care management) except (educational level) that shows there is a statistical significant association with nurses knowledge for a case group at post-test when analyzed by one way ANOVA and independent sample t-test.

The result of current study consistent with the study conducted to assess nurses` knowledge about the dressing process in surgical wards in Mosul hospital , which reported there is a statistical significant association between level of education and nurses` knowledge regarding the dressing process when analyzed by ANOVA test.[18]

A quantitative and a retrospective study was conducted at gynecology and general surgical departments of Kanizsai Dorottya Hospital in Nagykanizsa regarding nurses' knowledge about surgical wound care and its complications and the

knowledge of wound dressings, the result of this quantitative and retrospective study is inconsistent with result of current study; which revealed there was no significant difference between the education of nurses and the knowledge about the wound dressings. [22]

Recarding the association between nurses practices and their socio-demographic characteristic. The result of the present study indicates that there is no significant association between nurses` practices and their demographic characteristics (age, gender, marital status, educational level, general years of employment, years of employment in ICU or surgical wards, training session in wound assessment, and training session in wound care management) for a case group at post-test when analyzed by one way ANOVA and independent sample t-test.

The result of the present study is consistent with the study conducted in the city of Erbil, Iraq; which revealed there was no significant association between the wound dressing practice and nurses' characteristic of age, gender, educational level, years of experience and training participation. [19]

Whereas, the findings of current study inconsistent with the study conducted to determine the training needs of nurses working in an educational hospital related to patient care, cardio-pulmonary resuscitation, fluid-electrolyte balance, safe drug administration and wound care at university hospital in Turkey, the study revealed there is no statistically significant difference with age, gender, and years of work experience; however, the study revealed there is a statistically significant difference regarding education level of nurses with practices.[23]

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