Effectiveness of an Educational Program on Nurses' Knowledge Concerning Side Effect of Radiotherapy at Al-Amal National Hospital for Cancer Management in Baghdad City

اثر فاعلية البرنامج التثقيفي على معارف الممرضين ازاء التأثيرات الجانبية للعلاج الاشعاعي في مستشفى الأمل الوطني لعلاج السرطان

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الخلاصة
الهدف: تهدف الدراسة الحالية الى تقويم فعالية البرنامج التثقيفى على معارف الممرضين ازاءالتاثيرات الجانبية للعلاج الاشعاعى .
المنهجية :أجريت الدراسة الشبه تجريبية في مستشفى الامل الوطنى لعلاج السرطان للفترة من الرابع من تشرين الثاني 2013الى29من اب 2014- وتم بناء البرنامج والأداة من قبل الباحث لغرض تحقيق اهداف الدراسة، تم اختيارعينة غرضية تكونت من(60) ممرض وممرضة وقسمت العينة إلى مجموعتى، مجموعة الدارسة المنفذ عليها البرنامج التعليمي وتكونت من (30) ممرض وممرضة والمجموعة الضابطة تكونت من (30) ممرض وممرضة،ولقياس تأثيرالبرنامج التعليمي على معارف الممرضات والممرضين، استعمل الباحث استبانة احتوت فقرات تتعلق بالتأثيرات الجانبيه للعلاج الاشعاعي والمتضمنة (30) فقرة، وتم تحديد ثبات الاستبانة من خلال الاختبار القبلي والبعدي وحددت مصداقية الاداة من خلال عرضها على مجموعة من الخبراء ،وتم استخدام الإحصاء الوصفي (التكرارات والنسب المئوية ،الوزن المرجح والوسط الحسابي والانحراف المعياري) والإحصاءالاستدلالي (اختبارفيشرواختبارمربع كاي، واختبار التائى وذلك لإيجاد الاختلافات بين المجموعة الدارسة والمجموعة الضابطة .
النتائج : اشارت نتائج الدراسة بوجود فروقات ذات دلالة معنوية عالية بين مجموعتي الدارسة والضابطة وكذلك بين الاختبارالقبلي والبعدي للبرنامج حول معارف الممرضين المتعلقة بالتاثيرات الجانبية لعلاج مرضى السرطان بالاشعاع.
الاستنتاج :استنتجت الدراسة بوجود تأثير ايجابي للبرنامج التثقيفي المنفذ على معارف الممرضات والممرضين .
التوصيات :إجراء دراسات مكثفة لتوفير الخدمات التمريضيه لمرضى السرطان تحت العلاج الإشعاعي وبرنامج تعليمي للممارسات التمريضية تجاه الآثارالجانبية للعلاج بالاشعاع .

ABSTRACT
Objectives: The main aim of the study is to evaluate the effectiveness of an educational program on nurses' knowledge concerning side effect of radiotherapy
Methodology: Quiz experimental study was carried out at Al Amal National Hospital for Cancer Management from 4th, November 2013 to 29th August, 2014. The program and instruments were constructed by the researcher for the purpose of the study. Purposive random sample comprised of (60) nurses was divided into two groups, study group consisted of (30) nurses exposed to the nursing educational program and control group consisted of (30) nurses were not exposed to the program. The measurement of effectiveness of nursing educational program through the nurse s' knowledge questionnaire includes (30) items concerning side effect of radiotherapy. Reliability of instrument was determined and the instrument validity was determined through a panel of experts. The analysis of the data was used descriptive statistics (frequencies, percentages, the arithmetic mean and standard deviations relative sufficiently،) and statistical inferential (T Test, Fisher Test, Chi Square) In order to find the differences between the experimental group and the control group.
Results: The study findings indicated that, there were highly significant differences between study and control groups and also between pre and posttests in case group in overall main domains related to nurse s' knowledge concerning side effect of radiotherapy of cancer patients treatment.
Conclusion: The study concluded that the effectiveness of educational program regarding nurse s' knowledge concerning side effect of radiotherapy is a positive.
Recommendation: Intensive studies to provide nursing intervention for cancer patients under radiotherapy and an education program should be conducted of nurse's practice toward side effect of radiotherapy.
Key words: nursing; education; program; knowledge; side effect of radiotherapy, cancer patients

INTRODUCTION :

Cancer is a cause death, which can invade adjoining parts of the body and spread to other organs. This process is referred to as metastasis. Metastases are the major cause of death from cancer, leading it to of death worldwide, accounting for 8.2 million deaths in 2012[(1)].

Approximately half of all cancer patients worldwide are treated with radiation therapy alone or in combination with chemotherapy or surgery. Radiation therapy approaches employ ionizing radiation delivered either externally by linear accelerators or X-rays and γ-rays or internally with the use of radioisotopes to destroy cancer cells. Radiation therapy is, in general, localized, noninvasive and does not produce systemic toxicity after treatment in comparison with chemotherapy[(2)]

Radiotherapy is known as the use of x-rays and similar rays with high-energy to treat disease, where cancer cells in the treated area will be destroyed by radiation as well the healthy cells[(3)].

In general, radiotherapy for cancer has side effects, which are anorexia, mucositis, xerostomia, alopecia, skin reaction nausea and vomiting, esophagitis and dysphagia, diarrhea, cystitis, and bone marrow depression. Added to that, Fatigue is a common symptom in cancer patients that receive active treatment, limited number of reviews evaluating interventions refer to Fatigue during active treatment. Besides that, they are limited to the patients with advanced cancer or to the patients during radiotherapy. In addition, there is no systematic review to date on psychosocial interventions for fatigue during cancer treatment[(4)]

Patients being treated with radiation there must be a nursing care that aimed at problems related with the disease and its implications on the way the individual operates, and also it should be aimed at controlling, minimizing, and preventing the effects resulted from using radiotherapy. Furthermore, the nurse should be aware of the biological implications of radiation and the way these may compromise the normal daily activities of patient, in order to be able to give the effective care, and incorporate information and counseling [(5)]

Generally, nursing roles practices are improved, and had been performed in oncology nursing for many years. For instance, nurse practitioners could perform consults (physicals and history). Where, this consultation commonly executed by advanced nurse practitioners in collaboration with physician, manage symptoms associated with treatment during the activation of therapy, evaluate treatment responses, and estimate for the late effects associated with treatment or cancer recurrences in the follow-up processes. Meanwhile, the advanced nurse practitioners could work with the radiation oncologists in collaboration way in order to provide high quality care for patients[(2,6)]

OBJECTIVES OF THE STUDY:

1- To evaluate an educational program on nurses' knowledge concerning side effect of radiation therapy.
2- To find out relationship between nurses' knowledge with some variables (gender and educational level)

METHODOLOGY

Design of the study: A quasi experimental study.
Sample of the study: Purposive sampling was selected by randomized system which consists of 60 nurse was divided into two groups, study group consisted of (30) nurses exposed to the nursing educational program and control group consisted of (30) nurses were not exposed to the program.

Setting of the study: AL- Amal National Hospital for Management Cancer, collected from4th, November 2013 to 29th August, 2014.
Instruments: The questionnaire was constructed for the purpose of the study.
The Instruments consisted two parts:

Part I: Demographic Date Sheet:
This part concerned with personal information include, the nurses (gender, age, marital status, educational level, years of employment, years of experience in radiotherapy unit and number of training sessions).

Part II: Nurses knowledge:
The measurement of effectiveness of nursing educational program through the nurse s' knowledge questionnaire includes (30) items concerning side effect of radiotherapy. This part was consisted of eight Main Domains:-

1- general of nurses 'Knowledge concerning to radiation therapy(10items)
2- Side effects on the nervous system(3items)
3- Side effects on the respiratory system (2items)
4- Side effects on the lymphatic system and Cardiovascular(4items)
5- side effects on the digestive system (4items)
6- side effects on the skeletal systems(2items)
7- side effects on the dermatology system (3items)
8- side effects on the urinary system(2items)

Multiple choices where each question includes different options Questions have been formed to take the list is based on the System of right and wrong those answers were converted statistically to take Code (1) for the correct answer and code (0) for the wrong answer
The control group were given pre & posttest of nurses' knowledge at the same time that be given to the study group.
Validity of the instrument: Constant validity determined for questionnaire through the use of (14) panel experts who are faculty members from college of nursing and doctor oncologist. The experts were asked to review the questionnaire for content with clarity. Such changes were employed according to their suggestions and valuable comments.
Reliability of the instrument: Pilot study was carried out14th, November 2013 to 1st, December 2013. Ten nurses selected from Al-Amal Hospital National for Management of Cancer by inter examiners and intra examiner revealed that the reliability coefficients were (0.923) and(0.930) respectively of the knowledge test**.**
Statistical methods: The analysis of the data was used descriptive statistics (frequencies, percentages, Relative Sufficiency and the arithmetic mean and standard deviation) and statistical inferential (t test, Fisher test, chi square) In order to find the differences between the experimental group and the control group.

RESULTS :

Table 1. Distribution of Nurses by their Socio-Demographic

Variables	Case Group		Control Group		C.S. P_{-value}
	Freq.	%	Freq.	%	
Age(years)					t-test
20 – 24	1	3.3	1	3.3	p =
25 – 29	8	26.7	7	23.3	0.745
30 – 34	6	20.0	8	26.7	NS
35 – 39	6	20.0	7	23.3	
40 - 44	4	13.3	2	6.7	
45≥	5	16.7	5	16.7	
Total	30	100		100	
$\bar{x} \mp S.D.$	273	34.9∓1.	35.7∓1.406		
Gender					FEPT
Male	19	63.3	7	56.7	P =
Female	11	36.7	13	43.3	0.931
Total	30	100.0	30	100.0	NS
Educational level					t-test
Nursing school	7	23.3	4	13.3	P =
secondary Nursing School	5	16.7	5	16.7	0.708
Nursing Institute	12	40.0	18	60.0	NS
college of Nursing	6	20.0	3	10.0	
Total	30	100.0	30	100.0	
Marital status					t-test
Single	7	23.3	8	26.7	P =
Divorcee	3	10.0	3	10.0	0.775
Separated	2	6.7	2	6.7	NS
Married	18	60.0	17	56.7	
Total	30	100.0	30	100.0	
Years of Employment					t-test
1-5	15	50.0	10	33.3	P =
6 – 10	4	13.3	9	30.0	0.761
11 – 15	3	10.0	4	13.3	NS
16 – 20	4	13.3	3	10.0	
≤ 21	4	13.3	4	13.3	
Total	30	100.0	30	100.0	
Years of Experience at Oncology Units					t-test
1 – 5	19	63.3	14	46.7	P =
6 – 10	8	26.7	11	36.7	0.269
≤ 11	3	10.0	5	16.7	NS
Total	30	100.0	30	100.0	
Training Courses					t-test
None	11	36.7	12	40.0	P =

1 – 3	**9**	**30.0**	**14**	**46.7**	**0.096 NS**
4 – 6	**6**	**20.0**	**3**	**10.0**	
7- 9	**4**	**13.3**	**1**	**3.3**	
Total	**30**	**100.0**	**30**	**100.0**	

Table 1 revealed that the majority (26.7%) of nurses in the study group are within the age group (25 - 29) Years (Mean 34.9∓1.273) while (26.7%) of nurses in the control group are within the age group (30 - 34)(Mean35.7∓1.406) and (63.3%) of nurses in the study group were male and (56.7%) of nurses in the control group were male also.

Concerning to the educational level, most of nurses (40%) in the study group and (60%) in the control group were nursing Institute. Marital status of nurses (60%) in the study group and (56.7%) of nurses in the control group were married. In relation to the years of the employment in nursing most of nurses (50%) in the study group and (33.3%) in the control group were within the group (1-5). Concerning to the years of experience in oncology unit (63.3%) of nurses in the study (46.7%) of nurses in the control groups had expert (1-5) years at oncology units. Concerning training courses, (36.7%) of nurses in the study group hadn't training courses in radiation therapy and (46.7%) of nurses in the control groups had training courses in radiation therapy are within the (1-3) session.

Statistically, there is no significant difference between study and control groups related to age group, gender, educational level, marital status, years of employment, years of experience in the radiation therapy unit, and training courses.

Table (2): Comparison Significant Between the Case and Control Groups Regarding to Nurses' Knowledge at a Post Test

Overall Main Domains	Main Domains of Knowledge	No.	Post – Case			Ass.	Post – Control			Ass.	P-value	C.S.
			M.S.	S.D.	R.S.%		M.S.	S.D.	R.S.%			
Nurses' Knowledge concerning to radiation therapy	General of nurses' Knowledge concerning to radiation therapy	30	0.80	0.401	80	S	0.50	0.501	50	S	0.000	HS
	Side effects on the nervous system	30	0.84	0.364	84	S	0.53	0.502	53	S	0.000	HS
	Side effects on the respiratory system	30	0.81	0.393	81	S	0.43	0.500	43	F	0.000	HS
	Side effects on the lymphatic system and Cardiovascular	30	0.80	0.402	80	S	0.50	0.502	50	S	0.000	HS
	Side effects on the digestive system	30	0.74	0.440	74	S	0.48	0.502	48	F	0.000	HS
	Side effects on the skeletal systems	30	0.73	0.446	73	S	0.45	0.502	45	F	0.001	HS
	Side effects on the dermatology system	30	0.87	0.342	87	S	0.55	0.500	55	S	0.000	HS
	Side effects on the urinary system	30	0.68	0.469	68	S	0.45	0.502	45	S	0.009	HS
Overall Domains		30	0.79	0.406	79	S	0.49	0.500	49	S	0.000	HS

M.S. =Mean of score, SD = Standard Deviation ,R.S%=Relative Sufficiency , Ass.= assessment. ,C.S. : Comparison Significant , No.= Number of Sample , S : Significant at P <0.05 , HS : Highly Significant at P< 0.01, F : Failure ; S : Success.

Table 2 shows that there are highly significant differences between case and control group at post-test in overall main domains related to nurse's knowledge.

Table (3): Nurse's Knowledge Score between The Case and Control Groups at Pre-Post Program

Period	Knowledge score	Case		Control	
		Frequency	Percent	Frequency	Percent
Pre	poor	24	80.0	23	76.7
	fair	6	20.0	7	23.3
	good	0	0	0	0
$\bar{x} \mp S.D.$		55 ∓ 0.407		55.8 ∓ 0.430	
post	poor	0	0	14	46.7
	fair	10	33.3	16	53.3
	good	20	66.7	0	0
$\bar{x} \mp S.D$		91.8 ∓ 0.479		63.3 ∓ 0.507	

Freq.=Frequencies, %=Percentages,$\bar{x} \mp S.D.$=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.) .
Knowledge score: (less than50): poor ;(50 – 74): fair; and (75 – 100): good.

Table 3 shows high percent (80.0%) were poor level score for pre-test of study group with mean score and standard division (55 ∓ 0.407) , while (76.7%) were poor level for pre-test of control group with mean score and standard division(55.8 ∓ 0.430). This table Also, shows high percentile (66.7%) were good level score for post –test of study group, with mean score and standard division (91.8 ∓ 0.479), while (53.3%) for post –test of control group were fair level score, with mean score and standard division (63.3 ∓ 0.507).

Table (4): Association Between the Nurses' Knowledge and their Gender of the Case Group in Two Period(Pre and Post Program)

		Pre- Case					Post-Study				
Gender		Nurses' Knowledge		Total	Df	P. value	Nurses' Knowledge		Total	Df	P. value
		poor	Fair				Fair	Good			
Male	F	16	3	19	1	0.494 NS	6	13	19	1	0.789 NS
	%	53.3%	10%	63.3%			20%	43.3%	63.3%		
Female	F	8	3	11			4	7	11		
	%	26.7%	10%	36.7%			13.3%	23.3%	36.7%		
Total		24	6	30			10	20	30		
		80%	20%	100%			33.3%	66.7%	100%		

F= frequency, %= percentage, Df= degree of freedom, p = probability value, P>0.05=NS non significant

Table 4 shows that there was no significant relationship between nurse's knowledge concerning radiation therapy and their gender at both periods (pre and post tests)in Case group($p>0.05$). The majority of male nurses in pre study 53.3% had poor and post study43.3%of male had good level.

Table (5): Association between the nurses' knowledge and their educational level of the Case Group in Two Period(Pre and Post Tests)

Educational Level		Pre- Case Nurses' Knowledge		Total	Df	P. value	Post-Study Nurses' Knowledge		Total	Df	P. value
		poor	Fair				Fair	Good			
Nursing School	F	6	1	7	3	0.946 NS	2	5	7	3	0.197 NS
	%	20%	3.3%	23.3%			6.7%	16.7%	23.3 %		
Secondary Nursing School	F	4	1	5			2	3	5		
	%	13.3 %	3.3%	16.7%			6.7%	10%	16.7 %		
Institute of Nursing	F	9	3	12			2	10	12		
	%	30%	10%	40%			6.7%	33.3%	40%		
College of Nursing	F	5	1	6			4	2	6		
	%	16.7 %	3.3%	20%			13.3%	6.7%	20%		
Total		24	6	30			10	20	30		
		80%	20%	100%			33.3%	66.7%	100 %		

F= frequency, %= percentage, Df= degree of freedom, p = probability value, P< 0.05= NS non significant

Table 5 shows that there was no significant relationship between nurse's knowledge concerning radiation therapy and their education level at both periods (pre and post tests)in Case group(p>0.05). The data revealed that , those who graduate from nursing institutes of pre study 30% were poor and 33.3% in the same level of education of post study were good level.

DISCUSSION:

The sample consists of 60 nurses who were randomly selected to either a control group (n=30) or study group (n=30). The average age of the nurses was (Mean 34.9∓1.273) years in the study group and the average age of the nurses was(Mean35.7∓1.406) years in the control group ranged from 22 to more than 45 years .Most of the sample in both groups were males, married and graduated from nursing institute , (50%) of nurses in the study group with years of the employment in nursing and (33.3%) in the control group were within the group (1-5), (63.3%) and (46.7%) of nurses in the control groups had expert (1-5) years at oncology units .Concerning training courses in nursing, (36.7%) of nurses in the study group hadn't training courses and (46.7%) of nurses in the control groups had training courses as general in nursing are within the (1-3) session, there is no significant difference between study and control groups(table 1). Miaskowski et.al. (2004) mention that, sixty eight nurses that participated in the study, 57.4% were between the ages of(21 and 30) years, 58.8% were unmarried, and 55.9% had an associate degree[7].

Our study revealed that there was highly significant differences between study and control groups at post-test in overall main domains related to nurse's knowledge(table2).This results agree with the study by(Meurling et al.,2013)the perception of safety differed between professions before training. Nurses 'and physicians' mean self-efficacy scores improved, and nurse assistants' perceived quality of collaboration and communication with physician specialists improved after training. Nurse assistants' perception of the SAQ factors teamwork climate, safety climate and working conditions were more positive after the project

as well as nurses' perception of safety climate. The number of nurses quitting their job and nurse assistants' time on sick leave was reduced in comparison to the control ICU during the study period[8].

The researcher confirmed that the high percentile (80.0%) were poor level score for pre-test of study group with mean score and standard division (55∓ 0.407) , while (76.7%) were poor level for pre-test of control group with mean score and standard division(55.8∓0.430). While (66.7%) in the study group of post test were good, with mean score and standard division (91.8 ∓ 0.479), while (53.3%) for post –test of control group were fair level score, with mean score and standard division (63.3 ∓ 0.507)(table 3). The Results of a study were show that, the mean post test score was 21.78 ± 3.46 which showed an increased to the mean of pretest scores was 12.71 ± 3.13,when comparing the knowledge scores, the post test knowledge scores were significantly higher than the pretest score.[9]

The findings of our study, show that there were no significant relationship between nurse's knowledge concerning radiation therapy and their gender at both periods(pre and post tests) in study group The majority of male nurses in pre study 53.3%) had poor and post - study(43.3%)of male had good level.(table4)This results agree with the study by (Mohammadi et al,2009) the evaluating the knowledge of intensive care unit nursing staff showed there wasn't significant difference between the sexes of research units with the knowledge level about the nursing cares for patients at intensive unit [10].

The results in (table-5) revealed that there is not significant association between the level of education and the nurses 'knowledge in the study group to the all main domain (level of Knowledge) in pre-post test in radiation therapy unit($p>0.05$) The data revealed that , those who graduate from nursing institutes of pre study 30% were poor and 33.3% in the same level of education of post study were good level. The researcher confirmed that the findings provide an evidence that the advanced knowledge nurses and expert staff nurses are in a position to improve the way patients' side effects radiation therapy.

CONCLUSION

The study concluded that the effectiveness of educational program regarding nurses' Knowledge concerning side effect of radiotherapy is a positive and clear.

RECOMMENDATIONS :

1- An intensive studies to provide nursing intervention for cancer patients under radiotherapy and an education program should be conducted of nurse's practice toward side effect of radiotherapy.

2- Nurses must continually educate themselves to keep up to date on arising situations in health care. Nurses must be prepared to implement changes in patient care as soon as changes become necessary.

3- Provide book let was enhancing the nurse's knowledge about side effect of radiotherapy.

REFERENCES:

1. ***World Health Organization***(WHO) :cancer Fact sheet2014 .available on*http://www.who.int/mediacentre/factsheets/fs297/en/*
2. Carper E, and Haas M,: ***Advanced practice nursing in radiation oncology***. In Seminars in Oncology Nursing, (2006). 22(4), pp. :203-211.

3. Ruppert R,: Radiation ***therapy 101- What you need to know to help cancer patients understand their treatment and cope with side effects***. American Nurse Today, (2011), 6(1), pp.:24-29.
4. Frick E., Tyroller M., & Panzer M,: Anxiety, depression and quality of life of cancer patients undergoing radiation therapy: a cross-sectional study in a community hospital outpatient centre. ***European journal of cancer care***, (2007).vol *16*(2), pp:.130-136
5. Willard C, & LukerK,: Working with the team: ***strategies employed by hospital cancer nurse specialists to implement their role***. Journal of clinical nursing, (2007) 16(4),pp.:716-724.
6. Miaskowski C, Dodd M, West C, et al. Randomized clinical trial of the effectiveness of a self-care intervention to improve cancer pain management**.** ***J Clin Oncol***.(2004);22(9):1713–1720
7. Meurling L., Hedman L., Sandahl C., Felländer-Tsai, L., & Wallin C.-J.. :Systematic simulation-based team training in a Swedish intensive care unit: ***a diverse response among critical care professions. BMJ Quality & Safety***,(2013),VOL.*22*,PP:485–94.
8. Burns, N., & Grove, S.: The practice of nursing research: Conduct, Critique, & Utilization, (5th ed.). Amazon.com, Inc. or its affiliates:(2005):P.P.497-510.
9. Mohammadi Gh. R., Ebrahimian A. A., Mahmoudi H.: Evaluating the knowledge of intensive care unit nursing staff**.** ***Iranian Journal of Critical Care Nursing Spring*** (2009), Vol 2,(1); 41-46.