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Effectiveness of an educational program on nurses' knowledge regarding management of extravasation vesicant intravenous chemotherapy at oncology centers in Baghdad city

فاعلية البرنامج التعليمي في معارف الممرضين حول علاج التسريب الوريدي الكيمياوي الناضح للأدوية المنفطة في مراكز الاورام في مدينة بغداد

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المستخلص

الهدف: تحديد فاعلية البرنامج التعليمي في معارف الممرضين المتعلقة بعلاج التسريب الوريدي الناضح للادوية الكيمياوية المنفطة
المنهجية: دراسة شبة تجريبية لمجموعة واحدة (اختبار قبلي، واختبار بعدي اول، وبعدي ثاني) اجريت في المركز الوطني لعلاج الامراض السرطانية ومستشفى الامل الوطني لعلاج الاورام لغرض تحديد فاعلية البرنامج التعليمي في معارف الممرضين المتعلق بعلاج التسريب الوريدي الناضح للأدوية الكيمياوية المنفطة، للفترة من كانون الاول ٢٠١٨ إلى ٧ شباط ٢٠١٩، تم بناء البرنامج التعليمي واداة الدراسة من قبل الباحث لاغراض الدراسة تتكون من ٢٧ فقرة . تم اختيار عينة غير احتمالية عشوائية هادفة متكونة من (٤٠) ممرض يعملون في مراكز بغداد لأمراض السرطانية وتم اجراء اختبار قبل تطبيق البرنامج التعليمي واختبارين بعد تطبق البرنامج التعليمي المتكون من ثلاث محاضرات، وقد تم استخدام البرنامج الاحصائي للعلوم الاجتماعية الاصدار ٢٣ لتحليل البيانات وتم استخدام التحليل الوصفي (النسب المئوية، التكرارات والوسط الحسابي) و التحليل الاستدلالي (تحليل التباين الاحادي ، اختبار Tللعينة المرتبطة، واختبار مربع كأي).
النتائج: تشير نتائج الدراسة للاختبار القبلي إلى ضعف في معلومات الممرضين حول اجمالي المعلومات المتعلقة بمعالجة التسريب الناضح للادوية الكيمياوية المنفطة بينما يوجد تحسن في معارف الممرضين بعد تطبيق البرنامج وايضا تشير النتائج الى ثبات المعلومات بعد اجراء الاختبار البعدي الثاني حيث توجد فروق ذات دلالة إحصائية بين (الاختبار القبلي والاختبار البعدي الاول والثاني) في مجموعة الدراسة وايضا لاتوجد فروق ذات دلالة احصائية بين معارف الممرضين والمتغيرات الديموغرافية (الجنس المستوى التعليمي وسنوات الخدمة) بينما توجد فروق ذات دلالة احصائية في معارف الممرضين حول الادوية الكيمياوية المنفطة والمشاركة في الدورات التعليمية عند مستوى معنوية اقل من ٠,٠٥ لصالح الممرضين المشاركين في الدورات التعليمية.
التوصيات: اوصى الباحث بدورات تدريبية متخصصة للممرضين مع اجراء الامتحان للحصول على الفائدة وللتأثير على معارف الممرضين العاملين في ردهات الأورام، ويجب أن يكون الممرضين العاملين في ردهات الأورامقد اجتازوا دورات متخصصة عن الادوية الكيمياوية قبل الانضمام الى جناح الأورام.وتعميم برنامج موحد للخطوات الصحيحة لمعالجة التسريب الوريدي الناضح للادوية الكيمياوية المنفطة.
الكلمات المفتاحية : ادوية كيمياوية منفطة ، العلاج، التسريب ناضح

Abstract

Objectives: to determine the effectiveness of an Education Program on Nurses' Knowledge regarding management of extravasation vesicant intravenous chemotherapy
Methodology: quiz-experimental study (single-group pretest-posttest1 and posttest2) was directed in Amal oncology center and national oncology center in Baghdad city from 13th, December 2018 to the 7 of February 2019. The program and tool have been created by the researcher for the purpose of the study. A non- probability purposive sample of (40) nurses who employed in Baghdad oncology centers. Validity and reliability of the instrument were determined through a pilot study. Data were analyzed through the use of Statistical Package for Social Sciences (SPSS) version. Descriptive and inferential statistical measures were employed.
Results: The study results of pre-test for the participants of nurses revealed poor knowledge regarding overall management extravasation. While the results of post- 1 test exposed that the improved knowledge and stability by post 2 test indicated the positive effect of the education program about management extravasation.
.**Recommendations:** The researcher recommends a vital need of generalization of all the centers and hospitals that are given chemotherapy for educational and awareness program about management extravasation for nursing staff Regardless of gender and age difference.
Keywords: vesicant chemotherapy, management, extravasations

Introduction

The previous fifty years since the beginning of general, chemotherapy as a therapy for the management of equally hard and hematological malignant cells, there has been a persistent steady increase in its use[(1)]

Chemotherapy is a common name, anti-cancer, antineoplastic, or cytotoxic drugs are generally administered intravenously the function of cytotoxic medications in the treatment of malignancy is well traditional and increasing day by day Greater than 1,000,000 cytotoxic intravenous infusions are given on a daily basis global. In addition to their therapeutic effects on the malignant cells, cytotoxic agents have the ability to cause damage to healthful cells**.** [(2)(3) (4) (5)]

Cytotoxic intravenous treatment is linked to various problems, including infiltration and extravasation. These complications follow when the chemotherapy solution escapes into the surrounding tissues of the blood vessel. Extravasation, is defined as unintentional administration of intravenous vesicant solution chemotherapy into the surrounding tissues rather than into the vascular route [(1,6)]

Extravasation, the inadvertent administration of intravenous vesicant solution (chemotherapy) into the surrounding tissues rather than into the vascular pathway as intended, that actually leading to tissue necrosis, infection, loss of function, and delay in administering further chemotherapy on the other hand whereas leakage of a nonvesicant solution is called infiltration. These injuries can assist substantially to patient morbidity, and expense of therapy [(1,6,7)]

Vesicant chemotherapy agents can be divided into two categories: DNA binding and DNA non-binding. The DNA-binding agents such as anthracylines group are responsible for immediate tissue damage and, by remaining in the tissues, create a more prolonged course with a progressive tissue injury and necrosis.[(8)(9)(10)]

Non-DNA binding vesicants cause immediate tissue damage, but because they do not bind to DNA, these drugs are metabolized in the tissue and are more easily neutralized than DNA-binding agents and less effect on the cells. [(10)] This type of extravasation doesn't impair or destroy the tissue as well as injury usually stays localized, is slightly to moderately painful, and recovers over time. [(11,10,12)]

The incidence of chemotherapy extravasations among adults as published in the literature varies widely, ranging from (6 to 22%) however the general lack of

reporting and absence of centralized registry of chemotherapy extravasation events. [11,13]

There are currently five documented management strategies that can be used following cytotoxic drug extravasation, dependant on the category of the cytotoxic drug, volume and site of extravasation, local expertise and historical practice within institutions. [1,8]

These are the conservative strategy of 'watch and wait', surgical intervention, the topical application of ice or heat, the use of various antidotes, or saline washout technique [14,8,15] In light of the current strategies to the optimum management strategy for cytotoxic anthracycline drug extravasation, that there is a lack of published data to support the use of the saline washout technique [1,16].

The European oncology nursing society (EONS) originated a plan to develop a guideline throughout Europe to assist and promote the nurses' knowledge of evidence-based how managed the cytotoxic extravasations. [7,18].

Oncology Nurses had a vital role in avoiding extravasations vesicant chemotherapy [8]. Nurses who administer vesicant chemotherapy agents need to be aware of the most recent evidence and guideline by an up-to-date, evidence based strategy of treatment, in additional documenting extravasation and patient instruction. [14].

There is a rare number of studies conducted in relation to management extravasations it often detected by nurses, there must be aware with the symptoms, risk factor, prevention steps, and management of extravasation. Nurses with low knowledge are waiting for a physician's instructions that causes wasting of valuable time [19]

Methodology

A quiz-experimental design (signal group) was conducted in two oncology centers at national oncology center and Al-Amal National Hospital for the treatment of tumors from 13th of December 2018 to 7 of February 2019. The study was conducted at Al-Amal National Hospital for tumor treatment and National Center for Cancer Disease in Baghdad. A non-probability sample consist of (40) nurses selected randomly from both hospitals.

A constructional questionnaire was conducted by the researchers based on review of literatures and relevant references to evaluate nurses' knowledge which consist of two parts. .**Part one:** This part consists of (5) items regarding nurses' demographic data, including: (gender, age, level of

education, Number of years work in oncology words and participated in a training course). **Part two:** Knowledge test it consists of (27) items multiple choice questions which divided three domains, which as: First domain**:** Nurse's Knowledge regarding general information of extravasation which consists of (10) items, second domain**:** Nurse's Knowledge Concerning of vesicant Chemotherapy drugs which consists of (5) items and the third domain**:** Nurse's Knowledge about management extravasation vesicant intravenous Chemotherapy, which consists of (12) items

The content validity of the educational program and the knowledge test is obtained from a panel of (21) experts from different scientific branches having at least 5 years' experience in their field of work. The reliability of the research instrument (questioners) had been evaluated through the test and re test to determine questionable reliability the results were (0.851) with significant at (.002) level. A statistical program such as SPSS (Statistical Package for Social Science) version 23 was used to analyze the data through descriptive data analysis that included frequencies, percentages, and arithmetic mean as well as inferential analysis, one way (ANOVA), paired t-test and Chi-Square test.

Ethical Considerations

The Institutional Review Board (IRB) at the University of Baghdad, College of Nursing approved the study to be conducted. The study protocol meets both the global & the Committee on Publication Ethics(COPE) standards of respecting humans subjects' rights

Results:

Table (1): Distribution Demographic Data of Nurses Participants

Variables	Categories	F	%
Age	20-29	21	52.5
	30-39	12	30.0
	40-49	6	15.0
	50 and over	1	2.5
Gender	Male	21	52.5
	Female	19	47.5
Level of Education	Secondary nursing school	11	27.5
	Nursing institute	21	52.5
	Nursing college	8	20.0
Years of experience in oncology unit	< 1 year	22	55.0
	1-3 years	8	20.0
	4-9 years	4	10.0
	≥ 10 years	6	15.0
Training courses	No	31	77.5
	Yes	9	22.5

Table (4.1) The highest percent (52.5%) of the oncology nurses were male, while (47.5%) were female, (52.5%) of oncology nurses at age group (20-29 years) and only (17.5.0%) at age group (over 40 years), regarding education level the highest percent (52.5%) of the total sample was nursing institute, while (20.0%) of the total sample were nursing college. Concerning years of experience in oncology center, the highest percent (55.0 %) of oncology nurses was less than year and only (10.0%) of sample were (less than 5 years). Regarding chemotherapy training courses of these nurses, It Is observed that the most oncology nurses (77.5%) without training.

Table(2): Distribution of Effectiveness of the Instructional Program on the Nurses overall knowledge of Extravasation at pre, post-test 1and post - test 2

Period of test	Nurses knowledge of intravenous extravasation chemotherapy				
	Mean	S.D	test between pre and post-test 1	test between pre and posttest 2	test between post 1 and post-test 2
Pre-test	10.70	3.03	t /11.260	t /27.733	t/ 2.925
Post-test 1	23.20	2.56	p. =.000 /HS	p. =.000 /HS	p. = .006 /HS
$ Post-test 2	24.28	1.72			

ignificant level at p value ≤0.05 no= number, SD=standard deviation, p=probability= paired t-test

This table shows that there is high significant association between nurse's knowledge (pre and post - test 1) (p value ≤ 0.05, which reflects that the nurse's knowledge of overall extravasation affected by nursing education program

Table (3) Distribution and association of nurses knowledge main axis and their training courses in the field of chemotherapy in study group (n = 40)

General information Extravasation		Pre			Post1			Post2		
		H	M	L	H	M	L	H	M	L
Training courses in the field of chemotherapy	No	7	15	9	30	1	0	30	1	0
	Yes	2	5	2	9	0	0	9	0	0
	total	9	20	11	39	1	0	39	1	0
	Test value	χ^2 0.190 p=0.910 NS			χ^2 0.298 p=0.585 NS			χ^2 0.298 p=0.585 NS		
Vesicant Chemotherapy		**Pre**			**Post1**			**Post2**		
		H	M	L	H	M	L	H	M	L
Training courses in the field of chemotherapy	No	0	7	24	24	7	0	24	7	0
	Yes	0	6	3	7	2	0	8	1	0
	total	0	13	27	31	9	0	32	8	0
	Test value	χ^2 6.180 **p=0.01 HS**			χ^2 0.001 p=0.982 NS			χ^2 0.573 p=0.449 NS		
Management Extravasation		**Pre**			**Post1**			**Post2**		
		H	M	L	H	M	L	H	M	L
Training courses in the field of chemotherapy	No	1	16	14	27	4	0	30	1	0
	Yes	0	4	5	8	1	0	9	0	0
	total	1	20	19	35	5	0	39	1	0
	Test value	χ^2 0.521 p=0.771 NS			χ^2 0.020 p=0.886 NS			χ^2 0.298 p=0.585 NS		

(**) HS: Highly Sig. at P<0.01 NS: Non Sig. at P>0.05; Testing based chi-square test (χ2) (. Assessments Intervals Scales of general information extravasation: (L) Low (0.00 – 3.33)]; [M: Moderate (3.34 –6.66)]; [H: High (6.67 – 10)]. Assessments Intervals Scales of vesicant chemotherapy: (L) Low (0.00 – 1.66)]; [M: Moderate (1.67 –3.33)]; [H: High (3.34 – 5)]. Assessments Intervals Scales of vesicant chemotherapy: (L) Low (0.00 – 4)]; [M:Moderate(4.1–8)];[H:High(8.1–12)].

Results of chi-square test from table (4.13) show that there is no statistically significant association between participants of pre ,post 1and post 2 knowledge of general information and management extravasation with their demographic variable (Training courses in the field of chemotherapy) since Chi-square had p – value respectively greater than 0.05 .on other hand in the semi table refer to high statistically significant association between participants of pretest knowledge of vesicant chemotherapy and their training courses variable at P-value (0.01) greater than (0.05). Nurses share with training courses in field chemotherapy have a high score level knowledge of at axis vesicant chemotherapy than those no training.

Discussion

Throughout results of table (1) and outcomes of the present study, a distribution of the observed frequencies and percentages of nurses' socio-demographic characteristics variables. The data indicate that (52.5%) of oncology nurses belongs to (20-29) years of age group, and (52.5%) were male and the remaining were females. the results of this study indicate that the most of nursing staff in oncology centers are new employers

In a study conducted In India to assess to assess the existing knowledge and practice of (60) staff nurses on prevention and management of extravasation among infant receiving I.V. therapy, who showed in their study that all nurses who work with infant were female and at age group (20-25) years [20]

Regarding the educational levels status, highest percentage (52.5%) of the sample was nursing institute graduate. (55.0%) of oncology nurses, have less than one years of working in oncology wards, this may interpreted that most of the oncology nursing staff are a lack of experience and practice,. These results are inconsistent with the study who described that the majority (62.7%) of sample were general nursing and midwifery[20] also inconsistent with study that carried out in Pakistan by[4] they measure the levels of nurse's. The knowledge, skill and attitude after the conduct of education session regarding chemotherapy administration and management of 35 oncology nurses, their results showed (80%) were undergraduates, and (20%) had graduated in nursing education from the army nursing schools, and showed that the (43%) of the sample of nursing staff had (5 – 9) years of experience Caring Cancer Patients.

Concerning participation in training courses in the field of chemotherapy treatment, (77.5%) of the oncology nurses had no participation in training courses. The findings of the present study supportive evidence is available in the study that showed 78% of nurses has participation in training[1].

The result in present study may be indicated lacking of the role of continuing education units in centers of oncology at Baghdad city under the study, by the other hand attending continuous nursing education courses and training programs have the benefits for nurses to update and refining their knowledge in oncology wards.

A highly significant differences were observed between the scores of the knowledge test from pre to post1 and post 2 knowledge test related domains (P<0.01). Table(2) showed results in reference to testing significant studied of main domains as well as an overall knowledge concerning effectiveness of applying education program were reported most highly significant differences at P<0.01, which assigned clearly effectiveness of the education program were observed through increasing the level of knowledge participate nurse's. This is evidence of acceptance of the research hypothesis that emphasizes the effectiveness of the educational program also Stability of the effectiveness of the program and can be adopted and scattered on the centers administer chemotherapy drugs to benefit from program.

Outcome explanations that the effectiveness of education program related to that several factors may account for the apparent effectiveness of the of education program. These factors included teaching was done in several teaching method such as power point, posters; encouraging the nurses for discussion teaching and carried out through three sessions and providing written information (booklet) to them. This study is the first one to evaluate the levels of knowledge about management vesicant cytotoxic medications extravasation among nurses as education program. For this reason, the researcher recommends for further study based on this topics.

The data of table (3) pre and post education program (post 1 and post2) showed no statistical significant differences have been found between oncology nurses knowledge in three domains and their(age, gender, educational level, number of years working in oncology wards and training courses**)** at (P<0.05) related chemotherapy treatment domain. While a high statistically significant differences have just been found between participants of pretest knowledge of vesicant chemotherapy domain and their training courses at (P<0.05). Nurses who share in training courses about field of chemotherapy have a high score level knowledge of at domain vesicant chemotherapy than those who had no training.

However. the researcher thinks that the powerful role of continuing education in units centers of oncology, contribute to the actions in the face of certain events are standardized, showing itself as a managerial tool of great impact and maintenance of quality of nursing care in the sector of chemotherapy.

The current study was the first of its kind in Iraq in which effectiveness of educational program regarding management extravasation vesicant chemotherapy and, the researcher did not find research similar as program to support study

Recommendations

1. A vital need to standardize the educational program on the management of the extravasation
2. Equipping the extravasation kit in the oncology centers or at minimum their materials, such as dry, cold or hot compresses and antidotes.
3. Establishment of specialized units to treat, follow up and document all of cases extravasation.

4. Employ nurses who have more experience to working in outpatient chemotherapy and engage them in courses about the chemical drugs and management extravasation.
5. Establish a specialization of oncology nursing in order to prepare nursing staff with a scientific knowledge ability to provide the best health care for patients with cancer and improve the quality of their lives.

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