

Safe Handling Knowledge and Practices of Chemotherapy among Oncology Nurses in Erbil City

معلومات وممارسات حول التداول الآمن لاستخدام العلاج الكيماوي للمرضى العاملين في
الوحدات السرطانية في مدينة اربيل

Dler Hamad Esmail, B.Sc., M.Sc. Adult Nursing - Adult Nursing department, College of Nursing/Hawler Medical University/ Erbil- Iraq.

Chnar Salahddin Qadir, B.Sc., M.Sc. Adult Nursing- Adult Nursing department, College of Nursing/Hawler Medical University/ Erbil- Iraq.

Ezzadin Kamal Mahmood, B.Sc., M.Sc. Adult Nursing- Adult Nursing department, College of Nursing/ Hawler Medical University/ Erbil- Iraq.

Goran Abubker Osman, B.Sc., M.Sc. Adult Nursing- Adult Nursing department, College of Nursing/Hawler Medical University/ Erbil- Iraq.

Yousif Baker Omar, B.Sc., M.Sc. Adult Nursing- Adult Nursing department, College of Nursing/Hawler Medical University/ Erbil- Iraq.

E- mail: dler.hamad@yahoo.com

الخلاصة:

خلفية البحث: ان هنالك انتشار واسع للعلاج الكيماوي للمصابين بالإمراض السرطانية وهذا ما تسبب بزيادة المخاطر الصحية للمرضى العاملين في مجال تداول العلاج بهذه الأدوية لذلك يجب عليهم معرفة كيف وقاية أنفسهم من تأثيرات هذه الأدوية.
الهدف: ان الهدف من هذه الدراسة هو لتقييم معلومات وممارسات المرضى العاملين في الوحدات السرطانية حول كيفية التداول الآمن لاستخدام العلاج الكيماوي.

المنهجية: أجريت دراسة مقطعية واشترك بها 27 ممرض من العاملين في وحدات العلاج الكيماوي في مدينة اربيل وقد جمعت المعلومات عن طريق المحاورة ولفترة 20 دقيقة مع كل ممرض وشمل الاستبيان معلومات حول المعلومات الديموغرافية حول المرضى ومعلوماتهم وممارستهم حول كيفية التداول الآمن مع العلاج الكيماوي والمعوقات حول حاجات الحماية الشخصية. تم تحليل البيانات باستعمال الإحصاء الوصفي والاستنتاجي.

النتائج: كان معدل متوسط المعلومات والممارسات حول سلامة التداول للأدوية الكيماوية 15.59 و 1.96 و 8.74 + 1.78 وبشكل متعاقب وكان اكثر من ثلثي المرضى لا يعرفون بان العلاج الكيماوي يدخل الجسم عن طريق الغذاء الملوث و اما بالنسبة لممارستهم فكان اكثر من ثلاثة ارباعهم لا يغيرون الملابس الواقية بعد اعطاء الادوية الكيماوية وظهرت نتائج الدراسة بان هنالك علاقة سلبية بين المعلومات والممارسات وبمستوى 0.469 ودرجة حرية 0.014 وكذلك اظهرت النتائج علاقة سلبية بين الممارسات والمعوقات .

الاستنتاج: اغلب المشتركين في الدراسة كانت لديهم معلومات معتدلة في المعرفة والممارسة بالتداول مع العلاج الكيماوي.
التوصيات: اوصت الدراسة بضرورة اجراء تعاقبات العلاج الكيماوي للمرضى العاملين في وحدات الامراض السرطانية .
الكلمات الرئيسية: التداول الآمن، العلاج الكيماوي، مدينة اربيل.

Abstract

Background: Widespread use of chemotherapy in the treatment of cancer has lead to higher health hazards among nurses who handle and administer such drugs, so they should know how to protect themselves from effects of chemotherapy. Objective of study was to assess knowledge and practices of nurses for safe handling chemotherapy in Erbil City.

Methodology: A cross sectional study design was undertaken on 27 nurses in oncology units in Erbil City in 2015, to collect the data, patients who met the inclusion criteria were selected and questionnaires were filled through interviewing in 20 minutes. The questionnaire including demographic information and safe handling chemotherapy knowledge and practices and barriers of personal protective equipment. data were analysis by descriptive and inferential statistics

Results: The total mean score of knowledge and practices of safe handling chemotherapy was 15.59±1.96, 8.74±1.78 respectively and more than two to third of nurses had no knowledge that chemotherapy enter the body through contaminated foods, about practices more than three quarter no change of personnel protective barriers after contact with chemotherapy . Result of this study showed that was significant negative association between knowledge and practices ($r=-0.469$, $p=0.014$). Moreover, It is showed that significant negative association between practices and barriers ($r = 0.475$; $P = 0.012$).

Conclusion: Most of the study sample had fair knowledge and practices of safe handling chemotherapy.

Recommendation: Chemotherapy Safety protocol should be instituted for all oncology nurses who are working in oncology unit.

Keywords: Safe handling chemotherapy, Nurse, Erbil City

INTRODUCTION

Chemotherapy drugs include a wide range of chemical compounds because of their ability to kill tumor cell by interfering with cell division, they are extensively used to treat cancer. More than 11 million cancer cases diagnosed each year worldwide and expected to rise to 16 million by the year 2020, the rising patient's number leads to an increase in the use of chemotherapy drugs and more possibility of exposure of the health-care workers to these drugs and the number of staff potentially exposed to hazardous effect of the chemotherapy drug was more than 5.5 million ⁽¹⁾. The Oncology

Nursing Society recommends that in order to provide quality care and maintain safety standards, nurses must be competent in oncology nursing practices and have an awareness of risks amid their workplace. A major facet of this competency is that nurses must be remaining educated and regularly engage in standard practical safety guideline ⁽²⁾. Nurses may perceive they are immune to the risks of chemotherapy exposure, as existing research concludes that poor compliance may be associated with a knowledge deficit and perceptions of a low probability of immediate injury ⁽³⁾.

Knowledge is critical to safe nursing practices in all settings, but it is especially significant when a knowledge deficit of the nurse practices threatens personal safety or the safety of the patient. Past research suggests that chemotherapy may have unintentionally compromised the oncology work setting for more than thirty years ⁽⁴⁾. An extensive review of comprehensive standards associated with hazardous drug administration and the use of personal protective equipment (PPE) may be necessary to determine if policies and regulations need to be updated to correspond with current evidence ⁽⁵⁾. Results of this study provided information to facilitate the collaborative development of an educational plan for hospital to improve strategies and address deficits. In other words, once the study identified the presence and degree of knowledge practice's deficit to provide recommendations for a targeted intervention leading to a safer work environment in the future for patients and nurses. The objective of this study was to assess knowledge and practices of nurses for safe handling chemotherapy in Erbil City.

METHODOLOGY

A cross sectional study design was used to assess knowledge and practices of safe handling chemotherapy in Erbil City, in order to obtain the accurate data and representative sample, a non-probability (purposive) sample was used to select among 27 nurses in Rizgary Teaching Hospital and Nanakaly Hospital from 28 June 2015 to 2 October 2015 according to the following criteria, patients who agreed to participate the study and worked in oncology units. Data were collected through the use of questionnaire; which was developed by the researchers.

The questionnaire consist of two part: first part compose of demographic data of the nurses such as age, gender, professional qualification, total years of experience and training course and the second part consist of safe handling chemotherapy about knowledge 12 items and practices 7 items and also 10 items for the barriers of personal protective equipment for using chemotherapy drug and each part were rated two point scales (no 1 score and yes 2 score). Lower score would reflect poor knowledge and practices to safe handling chemotherapy. Data analysis was performed using SPSS 19 version information was summarized using frequency tables and cross tabulation. bivariate correlation (Pearson correlation) analysis was done to find out relationship between knowledge, practices and barriers of safe handling chemotherapy. P-value of equal or less than 0.05 was considered a statistically significant.

RESULTS:

Table 1. Characteristics data of oncology nurses

Demographic Data (n=27)		No	%
Clinical setting	Nankaly	16	59.26
	Rizgary	11	40.74
Age	20-28	6	22.22
	29-37	10	37.04
	38-46	11	40.74
Gender	Male	14	51.85
	Female	13	48.15
Total years of experience	≤1 Year	15	55.56
	>1 Year	12	44.44
Professional qualification	Diploma	19	70.37
	Bachelors	3	11.11
	Other	5	18.52
Training programmed for chemotherapy	Yes	5	18.52
	No	22	81.48

Table 1 shows the distribution of the sample according to demographic data. Concerning to the working area more than half of total (59.26%) was in the Nanakally Hospital and (40.74%) was in Rizgary Teaching Hospital. The age of the nurses ranged from 20-46 yearsold, the highest percentage (40.74%) of total sample was within age group (38-46) and lowest percentage (22.22) was within age group (20-28). Moreover, male and female were nearly equal percentages (51.85 and48.15) respectively. Furthermore, more than half percentage (55.56%) of nurses duration of experience less than one years while (44.44%) of them duration of experience more than one years. Regarding the professional qualification, the highest percentage (70.37%) of the study samplehad diploma and lowest percentage (11.11%) hadbachelor’squalification. In relation, to the program training for chemotherapy, the highest proportion of nurses (81.43%) was no training course and (18.52%) of nurses have training course.

Table 2. Knowledge of nurse of safe handling chemotherapy

Items	No		Yes	
	No.	%	No.	%
1-Chemotherapy can enter the body through breathing.	24	88.90	3	11.10
2. Chemotherapy can enter the body through ingesting.	17	63	10	37
3.Chemotherapy can’t enter the body through contact with contaminated surfaces.	8	29.60	19	70.40
4. Chemotherapy can enter the body through contact with spills.	16	59.30	11	40.70
5. Chemotherapy gas and vapor in air can enter the body through skin and mucous membranes.	20	74.10	7	25.90
6. Oral forms of chemotherapy do not have the potential to be absorbed.	23	85.20	4	14.80
7. Chemotherapy in liquid form can be absorbed through the skin.	20	74.10	7	25.90
8. A surgical mask provides protection from chemotherapy aerosols.	12	44.40	15	55.60
9. All types of gloves provide the same level of protection.	16	59.30	11	40.70
10. Chemotherapy can more easily enter the body through damaged skin.	24	88.88	3	11.12

1. Alcohol hand sanitizer is as effective as soap and water in removing chemotherapy residue.	22	81.50	5	18.50
2. Chemotherapy can enter the body through contaminated foods.	25	92.60	2	7.40

Table 2. Concerning the knowledge of nurse of safe handling chemotherapy, more than three quarter of nurses don't know that chemotherapy can enter the body through breathing. While, less than three quarter of nurses correctly responded to chemotherapy can't enter the body through contact with contaminated surfaces. Also, the highest percentage (92.6 %) of nurses was correctly respond to chemotherapy can enter the body through contaminated foods. While, more than half of nurses know a surgical mask provides protection from chemotherapy aerosols.

Items	No		Yes	
	No.	%	No.	%
1. No eating, drinking, smoking or doing make up at areas of drug administration	17	62.96	10	37.34
2. Wearing personnel protective barriers	23	85.20	4	14.80
3. Immediate change of contaminated personnel protective barriers after contact with chemotherapy	24	88.90	3	11.10
4. Dispose patients' excreta correctly	22	81.48	5	18.52
5. Washing hands thoroughly after any contact with chemotherapy	16	59.30	11	40.70
6. Washing skin and eye immediately after chemotherapy	19	70.40	8	29.60
7. Splashes and cleaning solid surfaces correctly	20	74.10	7	25.90

Table 3. Practices of nurse of safe handling chemotherapy

Table 3. Regarding, the practices of nurse of safe handling chemotherapy, the highest percentage(40.7%, 37.34) of nurses were washing hands thoroughly after any contact with chemotherapy and no eating, drinking, smoking or doing make up at areas of drug administration respectively. While, concerning not safe handling practices 88%, 85% of nurses were not immediate change of any contaminated personnel protective barriers after contact with chemotherapy and wearing personnel protective barriers consequently.

Table 4.
ofusing
protective

Items	No		Yes	
	No.	%	No.	%
1. I don't think PPE is necessary	15	55.60	12	44.40
2. I don't have the time to use PPE	9	33.30	18	66.70

Barrier
personal

equipment for safe handling chemotherapy

3. I was not trained to use PPE	14	51.90	13	48.10
4. PPE is uncomfortable to wear	9	33.30	18	66.70
5. PPE makes it harder to get the job done	9	33.30	18	66.70
6. PPE is not always available	6	22.23	21	77.77
7. Others around me don't use PPE	7	25.90	20	74.10
8 There is no policy requiring PPE	11	40.70	16	59.30
9. It is hard to get chemotherapy designated PPE	11	40.70	16	59.30
10. PPE is too expensive to use it all the time	12	44.40	15	55.60

Table 4 present the barriers of safe handling chemotherapy, nearly three quarter of nurses perceived main barrier of PPE is not always available and others around me don't use PPE. While, more than half of nurse not perceived barrier I don't think PPE is necessary and I was not trained to use PPE.

Table 5. Correlations between knowledge, practices and barriers

Items	1	2	3
1-Knowledge	-	-0.469 0.014	0.102 0.612
2-Practices		-	-0.475 0.012
3-Barriers			-

Table 5. Revealed that the relationship among knowledge, practices and barriers of safe handling chemotherapy showed that there was significant negative association between knowledge and practices ($r=-0.469$, $p=0.014$) and non significant positive association between knowledge and barriers ($r = 0.102$; $P = 0.612$). Moreover, It was showed that significant negative association between practices and barriers ($r = 0.475$; $P = 0.012$).

Table 6. Overall score of knowledge and practices of safe handling chemotherapy

Safe handling chemotherapy		No	%
Knowledge	Poor	0	0
	Fair	16	59.3
	Good	11	40.7
Practices	Poor	0	0
	Fair	17	63
	Good	10	37

Table 6 findings shows that overall scores of knowledge and practices of nurses of safe handling chemotherapy, the highest percentages (59.3%, 63%) of nurses had fair knowledge and practices consequently. While, lowest percentages (40.7%, 37 %) had good knowledge and practices respectively.

DISCUSSION

Today cancer patients are diagnosed earlier than the past and many receive multiple courses of chemotherapy treatment for a longer period of time⁽⁶⁾. The poor compliance of nurses with the safety measures of chemotherapy were consistently associated with several barriers including the incomplete facility, multitasking and work pressure, insufficient knowledge and techniques, lack of awareness and wrong beliefs as well as insufficient in-service training⁽⁷⁾.

In current study most of nurses don't know that chemotherapy can enter the body through contaminated foods and breathing. In the study which was done by Mason in the United Kingdom, significant concentrations of several drugs in both personal and area air samples were reported, drug particulates can become airborne after the drying of contaminated areas. Inadvertent ingestion may be an additional route of exposure. When food or beverages are prepared, stored, or consumed in work areas, they may easily become contaminated with airborne particles of antineoplastic drugs⁽⁸⁾.

In present study more than two to third of nurses were not immediate change of contaminated personnel protective barriers after contact with chemotherapy and wearing personnel protective barriers consequently this findings agree with this study showed that none of the nurses were using the protective equipment's necessary during the handling of chemotherapy. Nurses who had higher knowledge scores reported using at least one personal protective equipment significantly more frequently than the nurses who had lower knowledge scores⁽⁹⁾. Elshamy *et al*, (2010) showed that poor use of gloves, gowns and personal protective equipment by nurses when handling patient waste and when cleaning up spills which was supported the present study for handling chemotherapy, revealed that very small number of nurses used all of the recommended protective equipment⁽¹⁰⁾.

With regard, the barriers of safe handling chemotherapy about three quarter of nurses perceived main barrier of PPE is not always available and others around me don't use PPE, these findings are supported to those of a recent National Institute for Occupational Safety and Health (NIOSH) study where 80% of nurses reported they do not always use the recommended two pairs of gloves when handling chemotherapy⁽¹¹⁾.

The current result showed that overall scores of knowledge and practices of nurses for safe handling chemotherapy were fair while, nurses caring for patients receiving chemotherapy require specialized knowledge in order to ensure safety for both patients life and for their own safety of the jobs. Many nurses have been fired from their job due to medication errors⁽¹²⁾. In this respect, the results of the present study also, supported by the finding which was concluded that the total overall result of the study indicated that the participants have poor knowledge and skills, it is important for nursing care to cancer patients because if oncology nurses did not have advance knowledge and not competent in their skills will be considered as unsafe for providing chemotherapy administration to cancer patients and chances for medication errors can be high⁽¹³⁾. Nurses' knowledge about the handling of chemotherapy drugs remains a concern linked to improvement in safety standards and the higher the nurses' knowledge the more they use the safety measures in their practices⁽¹⁴⁾.

CONCLUSION

In general, the findings of the study shows that majority of nurses were fair knowledge and practices of safe handling chemotherapy.

RECOMMENDATION:

Chemotherapy safety protocol should be instituted for all oncology nurses who are working in oncology unit.

REFERENCE:

1. Conner T. and Diarmid M. Preventing occupational exposures toantineoplastic drugs in health care settings. *Cancer J Clin* 2006; 56 (I): 354–65.
2. Crannell, C. Chemotherapy Administration: Using simulation case-based scenarios to assess chemotherapy competency. *Oncology Nursing Forum*, 2012;39, 19-22.
3. Connor, T.H., DeBord, G., Pretty, J.R., Oliver, M.S., Roth, T.S., *etal.* Evaluation of antineoplastic drug exposure of health care workers at threeuniversity-based U.S. cancer centers. *Int J Occup Environ Med.*,2010; 52, 1019-1027. doi: 10.1097/JOM.0b013e3181f72b63
4. Hazen, S., Smith-Idell, C. &Howlett, K. Putting safe handling of hazardous drugs intopractice. In B. Faiman& T. Dolan (Eds.), *Spotlight on Symposia from ONS 35th AnnualCongress* 2010;(21-22). San Diego, CA: Oncology Nursing Society.
5. Walton, A.L., Mason, S., Busshart, M., Spruill, A.D., Cheek, S., *et al.*Safe handling: Implementing hazardous drug precautions. *Clin J OncolNurs*, 2012; 16(3), 251-254. doi:10.1188/12CJON.251-254
6. NIOSH Medical Surveillance forHealth Care Workers Exposed toHazardous Drugs Publication No. 2007-117.
7. Papa, D., Kampitsi, A., Katsaragakis, S., Leventelis, C., Papageorgiou, D. and Papadouri, A. Assessing Hellenic oncology nurses’ knowledge and practice about chemotherapy handling and administration.*Eur J OncolNurs*, 2010; 14, 278-282. doi:10.1016/S1462-3889(10)70116-2
8. Mason HJ, Blair S, Sams C et al. Exposure to antineoplastic drugs in two UK hospital pharmacy units.*AnnOccupHyg* 2005;49:603–610.
9. Kyprianou M, Kapsou M, Raftopoulos V, et al Knowledge, attitudes and beliefs of Cypriot nurses on the handling of antineoplastic agents. *Eur J OncolNur*, 2010 ;14, 278-82.
10. Elshamy K., El-Hadidi M., El-Roby M., and Fouda M., health hazards among oncology nurses exposed to chemotherapy drugs *Afr J HaematolOncol*2010;1(3):70-78.
11. Marcus, M.B.. NIOSH study documents: Safety guidelines still often not being followedby many nurses who handle hazardous chemotherapy. *Oncology Times*, 2014; 36(23), 12-13, doi: 10.1097/01.COT.0000459130.22023.82.
12. Khan, N., Zulfiqar, K., Khowaja, A., and Ali, T. Assessment of knowledge, skill and attitude of oncology nurses in chemotherapy administration in tertiary hospital Pakistan *Open Journal of Nursing*, 2012; 2, 97-103 OJNdoi:10.4236/ojn2012.22015 Published Online June 2012 (<http://www.SciRP.org/journal/ojn/>).
13. Rinke, M.L., Shore, A.D., Morlock, L., Hicks, R.W. and Miller, M.R. Characteristics of pediatric chemo- therapy medication errors in a national error reporting database. *Cancer*,2007; **110**, 186-195. doi:10.1002/cncr.22742.
14. Mohans, S., Wilkes, L.M., Ogunsiji, O. and Walkera, A. Caring for patients with cancer in non-specialist wards: The nurse experience. *Eur J OncolNur*2005; 1, 256-263. doi:10.1111/j.1365-2354.2005.00566.x .