ASPI | Afarand Scholarly Publishing Institute; Turkey
ISSN: 2345-2897; Health Education and Health Promotion. 2023;11(3):435-440. 10.58209/hehp.11.3.435

Effectiveness of an Instructional Program on Nurses' Practices Toward Blood Transfusion Procedure

ARTICLE INFO

Article Type
Original Research

Authors
Fadhil E.H. [1]* *MSc*
Bakey S.J. [2] *PhD*

How to cite this article
Fadhil EH, Bakey SJ. Effectiveness of an Instructional Program on Nurses' Practices Toward Blood Transfusion Procedure. Health Education and Health Promotion. 2023;11(3):435-440.

[1] Ministry of Health, Babylon Health Directorate, Baghdad, Iraq
[2] Adult Health Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq

Correspondence
Address: Ministry of Health, Babylon Health Directorate, Baghdad, Iraq. Postal Code: 51015
Phone: +964 781 062 6779
Fax: +964 781 062 6779
etherhaider50@gmail.com

Article History
Received: June 1, 2023
Accepted: July 3, 2023
ePublished: August 5, 2023

ABSTRACT

Aims Blood transfusion is considered one of the most efficacious medical interventions for saving lives. This study aimed to evaluate the effect of an instructional program on nurses' practices toward blood transfusion procedures.

Materials & Methods A quasi-experimental randomized was conducted from May 30, 2022, to October 13, 2023, in nurses working in two leading teaching hospitals (Imam Al-Sadiq and Al-Hilla) in Babylon governorate. the questionnaire that was based on previous research, modified by adding or removing some paragraphs, was used by the researcher to evaluate the level of practice possessed by nurses. The final draft of the tool is composed of two parts; nurses' socio-demographic data and nurses' practice about blood transfusion. The practice checklist of respondents to each question was scored from 1 to 3.

Findings The practice of the intervention group (1.83±0.17) was significantly higher than the control group (1.40±0.15) in the post-tests (t=25.05; df=49; p<0.001). There were no significant relationships between nurses' practices and age, educational level, working ward, gender, nursing experience, and recent working ward experience in the intervention group.

Conclusion The planned counseling program on nurses' practices toward blood transfusion is effective and changes the level of practice of nurses.

Keywords Instructional Program; Nurses Practices; Blood Transfusion Procedure

CITATION LINKS

[1] Knowledge and awareness of nursing students on ... [2] Knowledge of blood transfusion in medical ... [3] Impact of COVID-19 and lockdown regarding ... [4] Blood transfusion knowledge among nurses in Malaysia: A university ... [5] Incidence of blood transfusion reactions in Eritrea: A retrospective ... [6] Correlation between nursing practices regarding blood transfusion and its adverse ... [7] Impact of Years' Experience upon nurses' knowledge and practice concerning ... [8] Evaluation nurses' practices during intravenous canulation for children ... [9] Hemodialysis nurses' practices toward hand hygiene performance at Baghdad ... [10] Evaluation of nurses" practices toward the using of personal protective equipment's ... [11] Effectiveness of an educational program on nurses' knowledge and practices ... [12] Assessment of nurses' knowledge concerning prevention of central venous catheter ... [13] Evaluation of nurses' practices throughout hemodialysis treatment for ... [14] IDetermining factors that affect the compliance of Iraqi nurses with hand hygiene performance at a large ... [15] Assessment of nurses knowledge toward infection control measures ... [16] Assessment the nurses knowledge towards blood transfusion procedure ... [17] The study of nurses knowledge and performance quality of Qazvin ... [18] Transfusion practice and knowledge ... [19] Safe blood transfusion practices among ... [20] Factors associated with knowledge of the nursing staff at ... [21] Effect of training program on nurses' competent practices ... [22] Knowledge on safe blood transfusion practice ... [23] Nurses' performance regarding caring of ... [24] Assessing knowledge of nurses on blood ... [25] Nurses' knowledge assessment regarding blood ... [26] Knowledge of nurses regarding blood transfusion ... [27] TCcs project: Improving penetration of health ... [28] Effectiveness of health educational program on nurses' practices ... [29] Knowledge of blood transfusion among nurses at hospital ... [30] Inducing the health promotion model ... [31] Effectiveness of continuing nursing education program ... [32] Effectiveness of an educational program on ... [33] The impact of an educational program on blood ... [34] Assessment of safety nursing practices provided ... [35] Effectiveness of structured educational ... [36] Evaluation of nurses' practices toward ...

Copyright© 2023, the Authors | Publishing Rights, ASPI. This open-access article is published under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License which permits Share (copy and redistribute the material in any medium or format) and Adapt (remix, transform, and build upon the material) under the Attribution-NonCommercial terms.

Introduction

Blood transfusion is considered one of the most efficacious medical interventions for saving lives. However, it is not without its potential complications, which can result in adverse outcomes, including mortality. Blood transfusion is a crucial component of healthcare facilities, and nurses play a pivotal role in ensuring this procedure's safe and effective administration [1].

As per the American Medical Association's report in 2012, blood transfusion ranked as the fifth most frequently administered medical intervention globally. Unfortunately, the associated hazards and complications have increased [2]. Blood transfusion is indicated in cases of clinically significant bleeding, hemolysis that occurs during extracorporeal membrane oxygenation (ECMO) and renal replacement therapy (RRT), inflammatory anemia, and blood spoliation for routine biology [3]. Blood transfusions are a frequently performed medical intervention in hospitals with significant risks. Therefore, it is imperative that all nurses involved are knowledgeable about the potential complications associated with blood transfusions [4]. The majority of the reported blood transfusion reactions were acute in nature and primarily consisted of immunogenic febrile non-hemolytic transfusion reactions (37.8%), allergic reactions (29.7%), anaphylaxis (10.8%), and hemolytic transfusion reactions not related to ABO antibodies (8.1%). Only one reaction did not fall into these categories. The study revealed that the non-immunogenic responses were primarily characterized by hypotension (5.4%), followed by transfusion-associated circulatory overload (2.7%) and respiratory distress (2.7%) [5]. As per the findings of the Serious Hazards of Transfusion program, a majority of approximately 62.6% of the reported adverse reactions were attributed to unsafe practices by individual staff members [6]. The proficiency and implementation of precautionary measures and infection prevention strategies by nurses are fundamental in reducing the incidence of hospital-acquired infections in relation to blood transfusion [7-12].

Health workers in some occupational settings are more exposed to these pathogens. The primary role of personal protective equipment is to protect staff and reduce opportunities for the transmission of microorganisms in hospitals [10]. Personal protective equipment (PPE) components include gloves, gowns, bonnets, shoe covers, face shields, CPR masks, goggles, and surgical masks. How many components are used and how the components are used is often determined by regulations or the infection control protocol of the facility in question [13]. Nurses' knowledge and practices about precautions and infection prevention strategies are the cornerstones to minimizing the burden of hospital-acquired infections [14, 15]. In their study of transfusion errors published between 1989 and 1996, Wilkinson and Wilkinson observed that errors in blood transfusions were frequently attributed to nursing incompetence [16].

The occurrence of human errors during blood transfusion can be attributed to various factors, such as inadequate control or insufficient verification of patient identity before injection, incomplete patient profile records, errors in labeling units of blood or blood request forms, and inadequate attention to proper care during the transfusion process, as per the statement. The prevalence of blood transfusion and its critical role in patient survival underscore the need for nurses to possess a comprehensive understanding of and proficient skills in blood transfusion. The efficacy of this procedure is intricately linked to the knowledge and performance of nurses, with respect to the aforementioned items and the overarching objective of healthcare provider entities, such as the attainment of public health access [17]. The significance of evaluating the proficiency of healthcare practitioners involved in transfusion procedures has been highlighted, owing to the prevalence of multiple transfusion-related incidents in hospital settings. Ensuring patient safety during the blood transfusion process necessitates the nursing team and other relevant personnel to maintain up-to-date knowledge. This underscores the importance of continuous education and training for team members involved in blood transfusion [18].

The significance of nurses in effectively managing transfusion reactions cannot be overstated, owing to two primary factors: Firstly, nursing-related responsibilities are predominant throughout the transfusion process, and secondly, nurses represent the final stage in the transfusion process chain. It is imperative that nurses possess adequate knowledge and competencies pertaining to the transfusion of blood and blood products [19]. The nursing profession plays a crucial role in upholding transfusion safety, as the nursing team bears the responsibility of possessing practices regarding the indications for transfusions, verifying data to prevent errors, providing guidance to patients on blood transfusions, identifying and responding to transfusion reactions, and documenting the procedure [20].

Nurses are directly involved in treating patients undergoing blood transfusions; the transfusion process comprises five interconnected phases: blood grouping and cross-matching, patient preparation before blood bag collection, blood pack collection, pre-transfusion initiation of nursing responsibilities, and post-transfusion nursing care. Four phases are pertinent to customary nursing practice. The proficient handling and proper supervision of blood and blood product transfusions predominantly rely on nurses' expertise and competencies [19].

It is imperative that nurses possess a comprehensive understanding of both the theoretical and practical

aspects of their profession. A substantial amount of novel information will be necessary to provide a satisfactory standard of care for patients. The provision of nursing care has a significant influence on the health outcomes of patients. Enhancements in nurses' performance can potentially enhance patient safety [21]. Consequently, an imperative requirement exists for implementing a hospital-based training program to equip nurses with the necessary skills and knowledge to mitigate the risks associated with blood transfusions. This program should encompass comprehensive training on contemporary safety protocols, nursing interventions, and decision-making strategies while keeping abreast of recent advancements and technical innovations in transfusion medicine management and planning. This study aimed to evaluate the effect of an instructional program on nurses' practices toward blood transfusion procedures.

Materials and Methods

The quasi-experimental design technique was carried out in Al-Hilla City both teaching hospitals (Imam Al-Sadiq and Al-Hilla) from September 4, 2022, to May 30, 2023. The study samples were 100 nurses in the mentioned hospitals selected using a randomized sampling approach and were divided randomly into two control and intervention groups.

A two-part questionnaire was used for data gathering; nurses' socio-demographic data (age, gender, educational level, working place, number of years worked in nursing, and number of years worked in that location) and nurse's practice about blood transfusion consists of 20 questions regarding the roles that nurses are expected to play throughout the blood transfusion process. The time required for the practice checklist of each nurse took about 10-15 minutes. The respondent's previous experience in answering each question was assessed. As for the application portion, a three out of three score is given if three legitimate observations are used. If two out of three views are right, a score of two out of three is given. The validity of the tool was identified through the consultation of ten experts. The reliability was

After obtaining the needed permissions and registering the ethical code, the researchers attended the hospitals and conducted sampling. The samples' demographic data were recorded, and the questionnaire was filled in the pre-test by both groups. The educational program was performed on the intervention group. Three nurses were excluded from the intervention group due to not attending the educational sessions effectively. The educational program had 14 sections (the importance of blood transfusion, blood components, the therapeutic functions of blood, reasons for blood transfusion, the patient and the blood transfusion, time of blood transfusion, patient safety, management of blood components, documenting the necessary information about giving blood, harmful effects of blood transfusion, blood transfusion errors, storage and delivery of the blood unit, blood transfusion complications, managing the blood transfusion process) that was performed in four 90-minute sessions. After completing the educational session, all participants filled out the questionnaire of information about blood transfusion again. Five nurses in the control group did not participate in the post-test and were excluded.

The statistical analysis was done in SPSS 23 using the covariance, Fisher's exact, and independent T-tests. The significance level was considered 0.05.

Findings

The nursing experience mean was 3.6 years in the intervention and 4.0 years in the control group ($p<0.05$). The experience in the recent working ward mean was 1.8 years in the intervention and 2.1 years in the control group ($p<0.05$; Table 1).

Table 1. The distribution of the intervention and control groups' samples according to the demographical data

Parameters	Intervention		Control	
	No.	%	No.	%
Age group (years)				
18-27	25	50	26	52
28-37	20	40	18	36
38-47	5	10	5	10
48 and more	0	0	1	2
Gender				
Male	8	16	16	32
Female	42	84	34	68
Educational level				
Preparatory	9	18	14	28
Diploma	21	42	15	30
Bachelor	20	40	21	42
Working ward				
Medical	3	6	9	18
Surgical	13	26	0	0
Maternity	8	16	4	8
CCU	2	4	11	22
RCU	2	4	6	12
Neurologic	2	4	0	0
Blood disease	0	0	12	24
Orthopedic	4	8	0	0
Isolation	1	2	1	2
Psychiatric	0	0	1	2
Burn	3	6	0	0
HDU	11	22	1	2
Special department	1	2	1	2
Operation room	0	0	3	6
Diet	0	0	1	2

The practice of the intervention group (1.83±0.17) was significantly higher than the control group (1.40±0.15) in the post-tests ($t=25.05$; $df=49$; $p<0.001$).

There were no significant relationships between nurses' practices and age ($F=0.25$; $df=47$; $p=0.77$), educational level ($F=0.405$; $df=47$; $p=0.66$), working ward ($F=1.13$; $df=39$; $p=0.36$), gender ($t=0.118$; $df=48$; $p=0.99$), nursing experience ($F=1.25$; $df=41$; $p=0.29$), and recent working ward experience ($F=0.52$; $df=44$; $p=0.75$) in the intervention group.

Discussion

This study aimed to evaluate the effect of an instructional program on nurses' practices toward blood transfusion procedures. Around 50% of the intervention and control group samples were young nurses aged 18 to 27. In addition, more than half of the people in the control group and the majority in the research group were female. In addition, the findings showed that one-third of the people in the research group had a nursing diploma or certificate. In contrast, the same proportion of the control group has a bachelor's degree in nursing as the experimental group. The average number of years of experience in nursing for those in the study group was 3.6, whereas those in the control group had four years of experience. In recent years, young women have tended to enroll in institutes with a two-year study period to obtain a nursing diploma. This is due to the speed at which recruitment occurs in healthcare institutions. As a result, rather than completing all four years of a bachelor's degree program, they opt for the shorter two-year program, and as a result, the number of nurses has increased more than the number of males in the workforce. Concerning the age range, several studies concluded that most nurses were between 20 and 30, making up anything from one-third to more than two-thirds of the sample analyzed [22, 23].

Other study results disagree with the findings, which noted that more than half of the studied nurses are above 30 years old [24]. For gender, studies observed that almost all respondents were female and married [25, 19]. In several research, the participants were required to have a minimum qualification of a diploma in nursing or midwifery. This was determined based on the participant's degree of schooling and experiences. One survey reported that more than two-thirds of the nurses had a nursing diploma that required three years of study and between six and ten years of work experience, while another study found that more than a third of the nurses only had high school training in nursing. In contrast, about half of the people who responded to the survey had work experience ranging from 11 to 15 years. Only ten percent of those who responded to the survey had work experience ranging from six to ten years [23, 26]. Otherwise, studies found that more than half had a bachelor's degree in nursing [23].

The findings of this research mirrored those found by Hijji *et al.* [27], who found that just one-third of participants reported feeling the need for further training in blood administration. This might be because in-service refresher training courses are inadequate or because hospitals do not have a clear and up-to-date guideline procedure that nurses can access and adhere to while on the job [25, 28].

No significant relationship between demographic characteristics and nurses' practices was seen. It is agreed with the study conducted in teaching hospitals affiliated with Golestan University of Medical Sciences. Those findings indicated that the association between nurses' performance score and sex, age, working experience, and department of occupation was insignificant before and after the intervention. This finding was true both before and after the intervention [29-32]. A study was conducted at the Damanhour National Medical Institute, linked with the General Organization for Teaching Hospitals and Institutes, and at the Damanhour Oncology Center, affiliated with the Ministry of Health in Egypt. Both of these institutions are located in Damanhour. Ninety registered nurses came forward. The research shows that there is a correlation that is statistically significant between the practice levels of nurses and the socio-demographic features of those nurses. More specifically, the data suggest a discernible gap in the levels of practice that nurses have attained depending on the amount of education they have attained and whether or not they have participated in patient safety-related educational courses or training programs in the past. In the same way, there was not a statistically significant difference between the practice levels of nurses and their demographic features, including gender, age, and length of time working in the present ward [33-36].

Nursing education programs across all colleges are recommended to include a curriculum that provides training on blood transfusion procedures, similar to the program offered to the study group in this research study. It is recommended that hospitals offer comprehensive and ongoing practical training to their nursing staff concerning blood transfusion procedures. Additionally, any impediments that may hinder the professional development of nurses should be eliminated.

Conclusion

The planned counseling program on nurses' practices toward blood transfusion is effective and changes the level of practices of nurses.

Acknowledgments: The authors thank the Nurses participating in the study and the College of Nursing staff.

Ethical Permissions: This study was approved by the Council of the College of Adult Nursing of the University of Baghdad and the Research Ethics Committee.

Conflicts of Interests: The authors declared no conflicts of interest.

Authors' Contribution: Fadhil EH (First Author), Introduction Writer/Original Researcher/Discussion Writer (50%); Bakey SJ (Second Author), Introduction Writer/Methodologist/Assistant Researcher/Statistical Analyst (50%)

Funding/Support: This article results from the University of Baghdad/College of Nursing master's thesis in Adult Nursing entitled "Effectiveness of an Instructional Program on Nurses' Knowledge and Practices toward Blood Transfusion Procedure". The author(s) received no financial support for the research, authorship, and/or publication.

References

1- Shamshirian A, Alirahimi Z, Ghorbanpour A, Motamen S, Maadi N, Zamani P, et al. Knowledge and awareness of nursing students on blood transfusion. Int J Med Invest. 2017;6(4):129-34. [Persian]
2- Moschidou M, Tzanetakou IP, Lamnisos D, Kontekaki E, Fasoulakis Z, Kontomanolis EN, et al. Knowledge of blood transfusion in medical and biology students. Cureus. 2019;11(11):e6133.
3- Delabranche X, Kientz D, Tacquard C, Bertrand F, Roche AC, Tran Ba Loc P, et al. Impact of COVID-19 and lockdown regarding blood transfusion. Transfusion. 2021;61(8):2327-35.
4- Mohd Noor NH, Saad NH, Khan M, Hassan MN, Ramli M, Bahar R, et al. Blood transfusion knowledge among nurses in Malaysia: A university hospital experience. Int J Environ Res Public Health. 2021;18(21):11194.
5- Awolker S, Tekeste Y, Tesfamichael D, Nemariam S, Yacob N, Mehreteab Y, et al. Incidence of blood transfusion reactions in Eritrea: A retrospective cross-sectional study. GSC Biol Pharm Sci. 2020;12(2):206-11.
6- Abdelrazik E, Muhamed KA, Mohammed IR. Correlation between nursing practices regarding blood transfusion and its adverse reactions among patients at medical department. Minia Sci Nurs J. 2020;7(1):101-6.
7- Hattab WAA, Kadhim AJ, Abdulwahhab MM. Impact of Years' Experience upon nurses' knowledge and practice concerning infection control at critical care units in Baghdad city. Indian J Forensic Med Toxicol. 2021;15(1):2564-8.
8- Kadhum KJ, Bakey SJ. Evaluation nurses' practices during intravenous canulation for children in the emergency units. Mosul J Nurs. 2023;11(1):16-21.
9- Bakey SJ. Hemodialysis nurses' practices toward hand hygiene performance at Baghdad teaching hospitals. Indian J Public Health Res Dev. 2019;10(4).
10- Bakey S, Kadhum HY. Evaluation of nurses" practices toward the using of personal protective equipment's in haemodialysis unit at Baghdad teaching hospitals. 2012.
11- Mahmood WA, Khudur KM. Effectiveness of an educational program on nurses' knowledge and practices concerning nursing management of patients' with vascular access in dialysis centers at Baghdad teaching hospitals. Indian J Forensic Med Toxicol. 2020;14(3):2604-8.
12- Ahmed SA, Jasim AH, Katea MJ, Foaad AS, Hashim HA, Noori DA. Assessment of nurses' knowledge concerning prevention of central venous catheter infection in intensive care units at Baghdad teaching hospitals. Kufa J Nurs Sci. 2019;9(1):1-7.
13- Bakey S. Evaluation of nurses' practices throughout hemodialysis treatment for patients in hemodialysis unit at Baghdad teaching hospitals. Kufa J Nurs Sci. 2012;2(2):22-34.
14- Bakey SJ. Determining factors that affect the compliance of Iraqi nurses with hand hygiene performance at a large teaching hospital in central Iraq. Int J EnvironRes Public Health. 2016;17(20):11191.
15- Bakey SJ. Assessment of nurses knowledge toward infection control measures for hepatitis b virus in hemodialysis units in Iraq. Indian J Forensic Med Toxicol. 2088;16(1):2560-6
16- Osama Saleem A, Shatha Saadi M. Assessment the nurses knowledge towards blood transfusion procedure in Karbala city Hospital/Iraq. Ann Romanian Soc Cell Biol. 2020;25(6):10021-9.
17- Nemati Faed F, Maali A, Ahmadi MH, Poorkarim H, Rahmani H, Tabatabaei ZS, et al. The study of nurses knowledge and performance quality of Qazvin hospitals about the process of blood transfusion. Adv Nurs Midw. 2019;28(2):14-8. [Persian]
18- Hartford E, Muanantatha O, Valigy VI, Salimo S, Ziman A, DeUgarte DA. Transfusion practice and knowledge in Mozambique. Transfusion. 2015;55(7):1607-12.
19- Bediako AA, Ofosu-Poku R, Druye AA. Safe blood transfusion practices among nurses in a major referral center in Ghana. Adv Hematol. 2021;2021:6739329.
20- Tavares JL, Barichello E, Mattia ALD, Barbosa MH. Factors associated with knowledge of the nursing staff at a teaching hospital on blood transfusion. Revista Lat Am Enfermagem. 2015;23:595-602.
21- Khalaf S, Rabie Abed El Sadik B, Bayoumi M. Effect of training program on nurses' competent practices towards children receiving blood transfusion. IOSR J Nurs Health Sci. 2017;6(2):54-66.
22- Nessa S, Faruquee M, Yasmin N, Ahmed M. Knowledge on safe blood transfusion practice of senior staff nurses working in tertiary hospital. Asian J Med Biol Res. 2020;6(3):587-93.
23- Saied M, Razik BGA, Mohamed MF, Almezaien MM. Nurses' performance regarding caring of patients undergoing blood transfusion. Port Said Sci J Nurs.2016;3(2).
24- Yesilbalkan O, Akyol A, Ozel F, Kankaya H, Doğru B, Argon G. Assessing knowledge of nurses on blood transfusion in Turkey. Int J Caring Sci. 2019;12(1);521-8.
25- Abd Elhy A, Kasemy Z. Nurses' knowledge assessment regarding blood transfusion to ensure patient safety. IOSR J Nurs Health Sci. 2017;6(2);104-11.
26- Haza'a A, Odhah M, Al-Jaradi A. Knowledge of nurses regarding blood transfusion at public hospitals in Sana'a City-Yemen. Assiut Scientific Nurs J. 2021;9(26):1–10.
27- Hijji B, Parahoo K, Hussein MH, Barr O. (2013). Knowledge of blood transfusion among nurses. J Clin Nurs. 2013;22(17–18):2536-50.
28- Abdel Nasser J, Hassoun S. Effectiveness of health educational program on nurses' practices toward chemotherapy-induced peripheral neuropathy for children at hematology center in baghdad city. Iraqi National J Nurs Specialties. 2021;33(2):1-12.
29- Azdiana TDS, Arzuar ARN, Lee L. Knowledge of blood transfusion among nurses at hospital pulau pinang: Nursing responsibilities and patient management related to transfusion reactions. Educa Med J. 2016;8(7):47-56.
30- Khalifa MF. Inducing the health promotion model for nursing practice: Qualitative study. Iraqi National J Nurs Specialties. 2006;19(2).
31- Mohammed WK, Abas AH. Effectiveness of continuing nursing education program on nursing staffs, knowledge at kidney transplantation units in baghdad teaching hospitals. Iraqi National J Nurs Specialties. 2013;26(1).
32- Hasan RT, Rabea MA, Hussein E. Effectiveness of an educational program on nurses-midwives' knowledge about pain management during labor in Baghdad maternity hospitals. Iraqi National J Nurs Specialties. 2020;33(1):21-32.
33- Vaghar MI. The impact of an educational program on blood and blood products transfusion on nurses' level of knowledge and performance. J Med Life. 2018;11(3):238-42.
34- Ali SA, Hadad SE, Ahmed D. (2022). Assessment of

safety nursing practices provided to patients undergoing blood transfusion procedure. Alexandria Sci Nur J. 2022;24(1):89-99.
35- Dawood HA, Hassan H. Effectiveness of structured educational program on nurses' practices concerning therapeutic communication at cardiac care units in holy Karbala governorate hospitals. Iraqi National J Nurs Specialties. 2019;31(2):1-12.
36- Fadhil I, Hassan H. Evaluation of nurses' practices toward safe intravenous chemotherapy infusion in Baghdad city hospitals. Iraqi National J Nurs Specialties. 2019;31(2):43-56.