

Guideline adherence to chemotherapy administration safety standards: a survey on nurses in a single institute

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Objective: Little is known about the guideline adherence of nurses to chemotherapy administration guidelines. We determined the guideline adherence of nurses to the Chemotherapy Administration Safety Standards and the relationship between demographic characteristics and guideline adherence.

Methods: Survey sheets containing two questions on demographic characteristics and 16 questions on the guideline adherence of nurses regarding chemotherapy administration were distributed to all in-patient departments in our hospital in which chemotherapy was performed. All clinical nurses in the department were recommended to respond.

Results: Of 202 nurses, 123 responses were collected (61% response rate). The guideline adherence rate was >70% for 15 of 16 questions, but 55% of respondents indicated that there was no competency monitoring for nurses. Nurses with >7 years of clinical nursing experience felt more competent in performing cardiopulmonary resuscitation (CPR) than nurses with <7 years of clinical nursing experience ($p=0.032$).

Conclusion: The guideline adherence rate of nurses with respect to chemotherapy administration was high, with the exception of the absence of a competency monitoring for nurses. A significant number of nurses with <7 years of clinical nursing experience felt incompetent in performing CPR.

Keywords: Nursing, Drug therapy, Safety, Guideline adherence

INTRODUCTION

Accurate administration of chemotherapy agents is essential for the treatment of patients with cancer, because inaccurate administration can threaten patient safety and result in suboptimal treatment. However, accurate administration of chemotherapy agents is a challenging issue because there is a rapid increase in the complexity in administration of chemotherapy agents [1]. To prevent chemotherapy errors,

many researchers have recommended the adoption of standardized guidelines for the administration of chemotherapy agents and adherence to these guidelines [2-4].

In 2009, the American Society of Clinical Oncology (ASCO) and the Oncology Nursing Society (ONS) announced the Chemotherapy Administration Safety Standards (CASS), which included 31 standards regarding the safe administration of chemotherapy agents [1]. Because nurses play a central role in the administration of chemotherapy, the CASS included a detailed description of standards of nursing practice in chemotherapy administration.

Little is known about guideline adherence of nurses to chemotherapy administration guidelines, such as CASS. By determining the guideline adherence of nurses who administer chemotherapy, we can improve the guideline

Received Nov. 12, 2010, Revised Dec. 19, 2010, Accepted Dec. 19, 2010

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adherence of nurses and potentially prevent chemotherapy errors. Therefore, we determined the guideline adherence of nurses to CASS and the association of demographic characteristics with guideline adherence.

MATERIALS AND METHODS

1. Survey development

A survey containing two questions on demographic characteristics of respondents and 16 questions on guideline adherence of nurses regarding chemotherapy administration was developed by two of the authors (KK, YK). Questions were designed to evaluate the guideline adherence of nurses relative to CASS. We selected components of CASS which pertained to nurses and formulated questions to evaluate the guideline adherence to selected components of CASS. In addition to selected questions based on CASS, one question regarding the identity of labels inside and outside of a shaded cover (question 5) was added to the survey. Respondents were asked to choose 'yes' or 'no' to each question. If a respondent considered both 'yes' and 'no' to be inappropriate for any given question, a separate space was provided for the respondent's opinion. The process examining the reliability and validity of the questionnaire in a separate population was not performed.

Survey sheets were printed and distributed to all in-patient departments in our hospital in which chemotherapy was performed, and all clinical nurses in the department (n=202) were asked to respond. The survey sheet contained no identification information about respondents and no incentive for survey completion was offered. We did not file for the approval of the Institutional Review Board because this study was a survey on nurses.

2. Analysis

For responses which were neither 'yes' nor 'no,' two of the authors (KK, YK) independently evaluated the responses of the respondents and classified the responses into 'yes,' 'no,' or 'no analysis.' The 'no analysis' category included no responses and responses which could not be classified into 'yes' or 'no.' When there was a discrepancy in the classification of responses by the two authors, classification discussion between the two authors ensued and consensus was achieved. When a response was classified as 'no analysis,' the response was excluded from the analysis.

Descriptive analysis was performed using SPSS ver. 13.0 (SPSS Inc., Chicago, IL, USA). The percentage of 'yes' responses to each question were calculated, and was the basis for

determining the guideline adherence rate. The association of demographic characteristics with guideline adherence to each question was evaluated using the chi-square test or Fisher's exact test with a statistical significance of 0.05.

RESULTS

1. Demographic characteristics

Of 202 nurses surveyed, 123 responses were collected (61% response rate). The characteristics of respondents are summarized in Table 1. Nearly 80% of the respondents had >3 years of clinical nursing experience in nursing, and greater than one-half of respondents indicated that 10% to 40% of their patients were chemotherapy patients.

2. Guideline adherence

For most questions, the respondents reported that they adhered to guidelines very well. Specifically, for 13 of 16 questions, the guideline adherence rate was ≥85%. Only 3 questions (questions 6, 8, and 11) had guideline adherence rates <85%. Of the respondents, 29% indicated that they did not conduct routine bedside double-checking of the route and sequence of chemotherapeutic agent administration (question 6). Twenty-three percent of the respondents reported that they did not feel competent in performing CPR (question 8). Only 45% of the respondents reported the presence of a standard competency monitoring in the hospital or their departments (question 11).

Many responses to questions about intrathecal chemotherapy (questions 7 and 14) were classified a 'no analysis,' because many respondents had no experience with intrathecal chemotherapy (Table 2).

Table 1. Demographic characteristics of respondents (n=123)

Characteristics	No. (%)
Length of work experience as a clinical nurse (yr)	
<3	23 (19)
≥3 and <7	43 (35)
≥7 and <15	51 (41)
≥15	6 (5)
Percentage of chemotherapy patients in your practice	
<10	12 (10)
≥10 and <40	66 (54)
≥40 and <70	34 (27)
≥70	11 (9)

Table 2. Responses to select questions

Questions		Yes	No	No analysis
1	Check the height and weight of the patients at every cycle	120 (98)	3 (2)	0
2	For orders that vary from standard regimens, I request confirmation of the order by physicians	123 (100)	0 (0)	0
3	I do not take verbal orders, except to hold or stop the administration of chemotherapy	109 (89)	14 (11)	0
4	Before the administration of chemotherapy, two nurses verify the patient's name and medical record number, and drug name, dose, route of administration, volume, expiration dates/times, and appearance and physical integrity, and sign to indicate the verification was done	104 (85)	19 (15)	0
5	For a medication packed in a shaded cover, I confirm the identity of the labels inside and outside of the shaded cover	118 (96)	5 (4)	0
6	Before administration of chemotherapy at the bedside, two nurses verify the route and sequence of administration of chemotherapy	86 (71)	35 (29)	2
7	I bring the intrathecal and non-intrathecal medications to patients separately.	98 (96)	4 (4)	21
8	If necessary, I can perform cardiopulmonary resuscitation	92 (77)	27 (23)	4
9	There is a program in our hospital or department for continuing education regarding chemotherapy administration	113 (93)	8 (7)	2
10	There is a comprehensive educational program for new nurses administering chemotherapy in our hospital or department	103 (85)	18 (15)	2
11	There is a standard mechanism for monitoring the competent administration of chemotherapy in our hospital or department at specified intervals	54 (45)	67 (55)	2
12	Chemotherapy orders are always written and signed by residents, fellows, attending physicians, or qualified professional nurses	119 (98)	2 (2)	2
13	The chemotherapy medication label includes the patient's name and medical record number, and drug name, route of administration, dose, volume, date of administration, and date and time of preparation and expiration	121 (100)	0 (0)	2
14	Intrathecal medication is labeled with a uniquely identifiable label	81 (85)	14 (15)	28
15	Extravasation management procedures are defined	111 (92)	10 (8)	2
16	There is a process for reporting errors or near-errors with respect to the administration of chemotherapy	108 (90)	12 (10)	3

Values are presented as number (%).

Table 3. Association of the length of clinical work experience with perceived competency to perform cardiopulmonary resuscitation (CPR)

		Competency to perform CPR		Total
		Yes	No	
Clinical work experience (yr)	<7	44	19	63
	≥7	48	8	56
Total		92	27	119

p=0.039 by chi-square test.

3. Association of demographic characteristics with guideline adherence

The extent of experience as a clinical nurse was associated with the perceived competency in performing CPR. Nurses with ≥7 years of clinical nursing experience in nursing felt more competent in performing CPR than nurses with <7 years of clinical nursing experience (Table 3).

DISCUSSION

This study showed that the nurses in our institute generally adhered to CASS. The guideline adherence rate was >70% for 15 of 16 questions; however, greater than one-half of respondents indicated that there was no mechanism for monitoring the competency of chemotherapy administration. Adoption of a competency monitoring is a generally accepted method to improve the performance of health professionals in complex areas, such as advanced life support [5]. Therefore, to improve nursing performance, the development of a competency monitoring for health professionals involving in the administration of chemotherapy is needed.

Nurses with <7 years of clinical nursing experience felt that they were not competent to perform CPR. In fact, 19 of 63 nurses (30%) with <7 years of clinical nursing experience responded that they could not perform CPR. This finding suggested that education on CPR should be intensified for

nurses with a short career span.

Because this was a single institute study, the results are difficult to extrapolate to situations which exists at other institutes. We hope that this study will inspire a larger-scale, multi-institute study on guideline adherence to chemotherapy administration.

In summary, the guideline adherence rate of nurses with respect to chemotherapy administration was high; however, the mechanism for monitoring the competency of nurses is needed. A significant number of nurses with <7 years of clinical nursing experience did not feel that they could properly perform CPR.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ACKNOWLEDGEMENTS

We thank the nursing department staff of our institute for

distributing and collecting survey sheets and are appreciative of the nurses for their responses.

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