

Performance of Clinical Nurse Educators in Teaching Pharmacology and Medication Management: Nursing Students' Perceptions

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Abstract

Background: Pharmacological knowledge and medication management skills of student nurses greatly depend on the clinical nurse educators' performance in this critical issue. However, the Iranian nurse educators' performance in teaching pharmacology and medication management are not adequately studied.

Objectives: The current study aimed to investigate the nursing students' perceptions on the status of clinical pharmaceutical and medication management education.

Materials and Methods: A cross-sectional study was conducted on all 152 nursing students registered in the seventh and eighth semesters at the Qom and Naragh branches of Islamic Azad University, and Kashan University of Medical Sciences in 2013-2014 academic year. The students' perceptions on the performance of clinical nurse educators in teaching pharmacology and medication management were assessed using a researcher made questionnaire. The questionnaire consisted of 31 items regarding clinical educators' performance in teaching pharmacology and medication management and two questions about students' satisfaction with their level of knowledge and skills in pharmacology and medication management. Descriptive statistics was employed and analysis of variance was performed to compare the mean of scores of teaching pharmacology and medication management in the three universities.

Results: Among a total of 152 subjects, 82.9% were female and their mean age was 22.57 ± 1.55 years. According to the students, instructors had the weakest performance in the three items of teaching pharmacology and medication management based on the students' learning needs, teaching medication management through a patient-centered method and teaching pharmacology and medication management based on the course plan. The students' satisfaction regarding their own knowledge and skill of pharmacology and medication management was at medium level.

Conclusions: Nursing students gave a relatively low score in several aspects of their instructors' performance regarding teaching pharmacology and medication management. It seems that many clinical nurse educators in the studied settings were incompetent especially in teaching pharmacology and medication management, while these are critical areas and need special attention.

Keywords: Pharmacology, Medication Therapy Management, Teaching, Nursing Students

1. Background

Nurses are among multidisciplinary team members who play a significant role in health care and are involved in pharmacological management of the patients' conditions. They should have enough knowledge and skills regarding pharmacological and medication management, in order to establish a safe and high quality care (1).

Nursing education in Iran is a four year graduate model. In the first three years, students are taught in the nursing schools and also pass some clinical apprenticeship courses in hospitals under direct supervision of clinical instructors. Due to the load of teaching duties of educators, a large part of clinical courses are supervised by trainers or mentors other than those who taught students in nursing schools. The fourth year of nursing education is held in the form of internship in which nursing

students take direct role in implementing the patients caring plans with little or no supervision by an instructor or a mentor.

It is the nurses' and nursing students' responsibility to evaluate every patient before prescribing medications, administer the medication safely, monitor the patients for side effects, decide if a dose reduction is required for a patient (i. e, with renal failure) and to evaluate the efficiency of the prescribed medication. It is also essential to explain to the patients about their medicines and help the physician and pharmacist solve potential problems (2).

In a study in the United Kingdom approximately 25% of the nurses reported that the time spent on teaching medication management skills is inadequate. They believed that more time should be spent on this crucial area (3).

Some of the studies also reported that nursing students were not effectively prepared in the area of pharmacological and medication management (1, 4, 5) and emphasized that the current nursing curricula do not provide the students with sufficient opportunities to promote their performance in medication management. Consequently, many medication-related errors are made by nursing students (6-8) and nurses (9). A number of studies reported that nursing students have problems in calculation of medication dosage (10), frequently encounter uncertainty in the process of medication management (11), experience difficulties in application of safe injecting methods (12) and in understanding and demonstrating pharmacological concepts in clinical practice (13).

Reviewing medication management education systems, some of the studies addressed the reasons behind nursing students' medication errors and gaps in pharmacology (6-8, 14, 15). Several studies on factors affecting students' learning of pharmaceutical care, reported that clinical instructors' professional competence is the most determining factor in this area (5, 16, 17). It is reported that many nursing instructors are inexperienced and not competent in clinical training and clinical supervision (18).

Some of the studies investigated the nursing educators' challenges regarding clinical education and reported that despite their crucial role in preparing nursing students, they receive little support in developing their teaching skills, do not have opportunities for formal education and professional development related to their role (19, 20), and have no formal authority in clinical settings (21).

Most of the studies in the area of nursing students' pharmacological management investigated their knowledge and skills (2, 3, 11), the problems they experienced in their work (16), the type of medication errors they made (8), their confidence in medication calculations (10), or their perceptions on effective medication administration education and pharmacological education needs (22, 23). In two studies from Iran, Ghamari Zare et al. studied the nursing students' perspectives on factors affecting learning of pharmaceutical care in clinical settings (5) and their medication management skills (11). However, few studies are available on the status of clinical pharmaceutical care education. These studies are also conducted overseas and no studies on nursing students' views in this regard are available from Iran.

2. Objectives

The current study aimed to investigate the nursing students' perceptions on the status of clinical pharmaceutical and medication care education during internship program.

3. Materials and Methods

This cross-sectional study was conducted in two semesters in the 2013 - 2014 academic year at the Qom and Naragh branches of Islamic Azad University, and Kashan

University of Medical Sciences. The study population comprised senior nursing students and sampling included all nursing students who were in their fourth year of studying in nursing in these semesters (i.e., from October 2013 to late June 2014).

All of the students (those who were visitors at the institutions) were included in the population participating in the study ($n = 152$) and completed the questionnaire. Out of the 152 respondents, a total of 44, 29 and 79 were the students registered at the Qom and Naragh branches of Islamic Azad University, and Kashan University of Medical Sciences, respectively.

A three-part, researcher made instrument was used to collect the data. The first section included three questions about students' gender, age and affiliation. The second section including 31 items associated with clinical educators' performance in teaching the process of pharmacological management. The students were asked to evaluate their educators' performance during four years at university using the percentage they enhanced the students' knowledge and skills in pharmacology and medication management. The range of responses included less than 50% (= 1); 50% to 75% (= 2); and 75% to 100% (= 3). Questions were not divided into themes or groups. They were prepared through literature review and in accordance with the principles of teaching and skills of medicine preparation and administration activities, clinical skill of administering an injection and post medication care (24). Finally, there were two questions about students' satisfaction with their level of knowledge and skills in pharmacology and medication management. They were: "Currently, how much are you satisfied with your own pharmaceutical care skills?" and "Currently, how much are you satisfied with your own pharmacology knowledge?" The answers were very low (= 1), low (= 2), moderate (= 3), high (= 4) and very high (= 5). The instrument was distributed among the students in their breaks during the internship period.

The questionnaire was reviewed by a number of nursing faculty members at the school of medical sciences of Islamic Azad University, Qom branch, and Kashan University of Medical Sciences and they confirmed its content validity after some modifications based on their comments. The reliability of the questionnaire was assessed through internal consistency method (25) after administration among ten senior students in Islamic Azad University (Qom branch); and the Cronbach's alpha was 0.87.

The respondents were invited to complete the questionnaires in a quiet and private environment and the researcher or a research assistant collected the questionnaires after the completion which took about 15 minutes.

3.1. Ethical Considerations

The study was approved by institutional review board and the research ethics committee of Islamic Azad University, Qom branch. Afterwards all nursing students in the seventh and eighth semesters of nursing bachelor

program at the Qom and Naragh branches of Islamic Azad University, and Kashan University of Medical Sciences were invited to participate in the study. All of the respondents voluntarily signed the written consent form attached to the questionnaire. The students were assured that all the information would remain confidential and the questionnaires were anonymous. The researcher explained to the participants about their rights of voluntary participation.

3.2. Data Analysis

Data analysis was performed using the SPSS Version 13. Descriptive statistics (frequency, rate of frequency, mean, and standard deviation (SD) were used in this study. The

maximum and minimum of the total average were also calculated for each item. ANOVA was performed to compare the mean of pharmaceutical care education scores in the three universities.

4. Results

The study was conducted on 152 nursing students among whom 82.9% were female and their mean age was 22.57 ± 1.55 years, ranging from 21 to 29 years. The mean and standard deviation of 10 weakest items on clinical educators' performance in teaching pharmacological management in the three universities are presented in Table 1. The item "teaching pharmacological management based on students' learning needs" earned the lowest rank.

Table 1. The Scores of Ten Weakest Items on Clinical Educators' Performance in the Three Universities^a

Rank	Item	Universities			Overall Score	P Value
		Islamic Azad University, Qom Branch	Kashan University of Medical Sciences	Islamic Azad University, Naragh Branch		
1	Teaching pharmacology and medication management based on students' learning needs	1.15 ± 0.42	1.82 ± 0.71	1.55 ± 0.63	1.57 ± 0.68	0.001
2	Teaching pharmacology and medications management through a patient-centered approach rather than a disease-centered method (e.g., explaining why drugs are prescribed by physicians for patients in accordance with their needs)	1.18 ± 0.44	1.77 ± 0.65	1.68 ± 0.6	1.58 ± 0.64	0.001
3	Teaching pharmacology and medication management based on the course plan (i.e., introducing specialized drugs in general clinical courses, introducing classification of anti-tumor drugs at the first clinical apprenticeship)	1.20 ± 0.46	1.74 ± 0.66	1.86 ± 0.63	1.61 ± 0.66	0.001
4	Teaching medication management and recording it based on the nursing process	1.38 ± 0.57	1.81 ± 0.6	1.68 ± 0.66	1.66 ± 0.62	0.001
5	Clearly outlining students' responsibilities in medication management and pharmacological care	1.47 ± 0.54	1.74 ± 0.66	1.72 ± 0.64	1.66 ± 0.64	0.064
6	Introducing objectives, assessment criteria, and practices related to students' pharmaceutical care at the beginning of clinical courses	1.59 ± 0.65	1.67 ± 0.72	1.75 ± 0.68	1.66 ± 0.69	0.604
7	Giving constructive feedback and advises about their own medication errors, technical errors, or inaccurate medication recordings	1.27 ± 0.49	1.92 ± 0.67	1.72 ± 0.52	1.69 ± 0.66	0.001
8	Providing students with opportunities to make a decision rather than providing immediate advice	1.54 ± 0.69	1.78 ± 0.69	1.68 ± 0.66	1.69 ± 0.72	0.218
9	Introducing good and sufficient resources for better learning of pharmacological care	1.65 ± 0.68	1.69 ± 0.66	1.82 ± 0.6	1.71 ± 0.65	0.545
10	Avoiding frequent and direct supervision of experienced students' medication management practices	1.54 ± 0.69	1.79 ± 0.72	1.72 ± 0.64	1.71 ± 0.7	0.164

^aAll data are presented as mean ± SD.

According to the majority of students, 75%-100% of educators are always or often eager to promote students' knowledge and medication management skills. The students indicated that they were taught the skills related to medication management (i. e., hand washing, cleaning the tray before putting the drug, wearing gloves before injections, etc.) and safety practices related to medication management (i. e., asking patients' names, avoiding re-using needles, informing patients about medication side-effects and management of saline solution, etc.).

Students' responses to two of the questions related to their level of satisfaction with the knowledge of pharmacology and skills of medication management produced the mean and standard deviation of 2.56 ± 1.03 and 2.87 ± 0.91 , respectively. These values are close to medium satisfaction.

5. Discussion

The current study aimed to assess the status of clinical pharmaceutical and medication care education from the nursing students' perspective. Authors did not focus on specific educators; but focused on the performance of all clinical nurse educators regarding pharmacology and medication management education. The results indicated a poor quality of education in several aspects of pharmacology and medication management education. Due to the crucial importance of pharmacology and medication management in nursing and in patients' health and safety, the findings signified the urgent need to take measures to overcome the problems and reduce the potential risks.

According to the students, instructors had the weakest performance in the three items of "teaching pharmacology and medication management based on students' learning needs", "teaching medication management through a patient-centered method" and "teaching pharmacology and medication management based on the course plan". Teaching pharmacological management in clinical setting is a very important activity which not only needs paying attention to the patients' health and safety needs but also to the students' learning needs. A clinical educator who teaches clinical pharmacology and medication management should be proficient in pharmacology and diagnosing and prioritizing both the patients and the students' needs. The current study findings showed that clinical instructors were weak in clinical education and had weak knowledge on pharmacology and medication management. It also seems that clinical educators have no specific course plans or specific objectives especially in the field of pharmacology and medication management. This made them present some general and occasionally unrelated materials in inappropriate occasions. For instance they might present some materials about classification of anti-tumor drugs at the first clinical apprenticeship. Previous studies in Iran have also shown that the majority of nurse

educators mostly focus on issues such as dosage calculation and take the prescribed dose in specific times of a day (5, 26, 27), instead of how a nurse can decide a dose reduction required for a patient with renal failure for example. Such a condition also implies that educators have little knowledge of pharmacology. This is why nurses and nursing students need a high level of knowledge on pharmacology and medication management in order to care for their patients appropriately. Although not on nursing students' however, a study on nurses' information needs and information seeking behaviors, have reported that nurses require pharmacological information more often than other types of information. Therefore, they sought pharmacological information nine times a week while they sought epidemiological data only twice a week (28). A study in Iran showed that nursing students are often anxious about their capability to implement their knowledge and skills on physiology, anatomy and pharmacology. They mostly attributed this weakness to ineffective teaching (28).

The results of the present study implied that the students wished to receive constructive feedbacks about their medication management practices. However, the item "giving constructive feedback and advice about their own medication errors, technical errors, or inaccurate medication recordings" was among the ten weakest items. This finding not only shows the weak performance of clinical instructors in this regard, but also signifies the importance of timely and appropriate feedback on the students learning. Consistently, a qualitative study on student nurses' perceptions of effective medication administration education, has reported that nursing students wished not only to encounter frequent learning opportunities, but also to receive timely feedback on their performances in medication administration (22).

In the present study, the item "teaching pharmacology and medications management through a patient-centered approach" scored as the second weak item. This finding confirms that clinical instructors usually teach through a functional or work-based approach in their clinical educations. A previous study showed that nursing students prefer to learn pharmacology and pharmaceutical care through a patient-centered approach (5). Heshmati et al. investigated the nursing students perspective on effective clinical teaching and reported that nursing students believed that patient-centered approaches cause patients be considered as a whole, while work-based training cannot produce a meaningful learning (29).

The results of the two questions about students' level of satisfaction with their own knowledge of pharmacology and medication management skills indicated that they evaluated themselves as having a moderate level of knowledge and skills. In this regard, the results of previous studies highlighted that nursing students acquire insufficient level of pharmacological knowledge during nursing bachelor programs (13, 23, 30). The insufficient

pharmacological knowledge of nursing students predisposes them to medication errors (8, 31). For instance, the lack of pharmaceutical knowledge and medication management skills might lead the students to administer penicillin to the patients who are penicillin-allergic due to the lack of check (32).

The present study showed that although nursing schools of all the three universities were relatively similar in their educational performance in teaching pharmacology and medication management, however the scores of Kashan University of Medical Sciences were approximately higher in most instances. This finding shows the urgent need to pay special attention to the quality of education in all nursing schools and with special focus on the Islamic Azad University.

In conclusion, the study showed that nursing students give a relatively low score in several aspects of their instructors' performance regarding teaching pharmacology and medication management. It seems that many clinical nurse educators in the studied settings are incompetent especially in teaching pharmacology and medication management while this is a critical area and needs special attention. It is necessary to plan properly for each element of clinical education (objectives, content, educators, and evaluation) to achieve the goals of nursing education. According to the above-mentioned findings and nursing instructors' incompetency in some areas, it is necessary to enable nurse instructors in teaching principles and practices of pharmaceutical care and to revise nursing programs. Therefore, it is recommended that clinical nurse educators go through in-service courses to upgrade their competency not only in clinical teaching, but also in pharmacology and pharmacological management. The current study examined only the students' perspective; however, the instructors' perspective on the existing barriers to appropriate pharmacological and medication management education should also be assessed. In addition, more objective assessments on the students' knowledge and skills and the clinical educators' performance are recommended. The study also assessed the students' perspective of all educators and had no focus on the performance of individual instructors. Then, the retrospective nature of the assessment might induce some biases on the results. It is recommended that the students' perspective on the same issue be immediately assessed after each clinical rotation, not only the performance of all instructors, but also their specific strengths and weaknesses can be assessed. Then more appropriate in-service education programs might be designed to overcome the problems.

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Footnotes

Authors' Contribution: Zohre Ghamari Zare: study conception and design, preparing the first draft of manuscript and data collection from the Qom and Naragh branches of Islamic Azad University, and Kashan University of Medical Sciences and the data analysis. Mohsen Adib-Hajbaghery: design of questioner, made critical revisions to the paper, and preparing the final revision of the manuscript.

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