The Effect of Health Educational Intervention Program About Drug Administration and Utilization on Nurse's Knowledge at Suez Canal University Hospitals at Ismailia City

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Abstract:

Background: A drug is a chemical substance intended for use in diagnosis, treatment, cure, mitigation, or prevention of a disease. Medication administration requires specialized knowledge, judgment based on the principles of pharmacology. **The aim** of the study to assess the effect of health educational intervention program about drug administration and utilization on nurse's knowledge. **Research design**: A quasi experimental design was used. **Sample:** A purposive sample composed of 154 nurses responsible for drug administration at different hospital departments. **Setting**: suez Canal university hospitals at Ismailia city. **Tools**: used were an interview questionnaire composed of personal data and their knowledge about drug administration and utilization. **Results** of the current study revealed that the majority of studied sample were female and had diploma degree their mean age were 24.25 ± 3.7 years and their years of experience ranged from 1.20 years, the majority had inadequate knowledge about drug administration and utilization and most of them improved post intervention. **Conclusion**: the health education program improves nurse's knowledge "about, drug administration and utilization provide at all hospitals departments with necessary education media about drug administration. **The study recommended** that health education program about drug administration and utilization should be implemented for all nurses worked in different hospital departments.

Keywords: Drug administration, Utilization, Health education.

Introduction:

Alterations in health related to acute or chronic conditions lead client to seek of their symptoms through various treatment options. One modality frequently used to help alleviate symptoms and restore health is a medication regime. Medication are substances used by the client's them to help them in treatment some complain or discomfort, also drug is considered the main way help in relief, or cure. Also drug is considered the main way help in this medication were described by physician according to patient condition relief, or cure of the cause of the client's health alterations also.[1]

This medication gives to patient according to specific. A drug is a chemical substance intended for use in the diagnosis, treatment, cure mitigation, or prevention of a disease. When a drug is given to a client, there is an intended specific assumption mad by nurses before administration. This assumption is implied the medication gives to patient according to specific standards that are set to ensure drug uniformity in strength, purity, efficacy, safety, and bioavailability. [2,3]

Drug utilization is the making, distribution, prescription use of drugs in a society, with special emphasis on

the medical, social and economic consequences.[4]

Medication administration requires specialized knowledge based on the principles of pharmacology. The nursing process is used to direct nursing decision relative to safe drug administration and to ensure compliance with standards of practice. [5,6]

The description of medication requires the implementation of safety guidelines, following the five rights of given medication of given medication are administered in accordance with set procedure based on the prescribed rout. Procedures and guidelines for medication administration by the following routes: oral, including sublingual, buccal, parentral, topical application and inhalation.[7]

All health care institutions are required to meet minimum standards set by federal, state, and local agencies. In addition to these standards, most institutions have established specific policies that regulate administration of medication within the institution. [8]

Nurses play an essential role in the administration, education and evaluation of the effectiveness of prescribed medication. The nurse's role changes with the setting of client, for example of the home care and community setting, clients take their own medication as prescribed by the practitioner and nurse instrument patient about methods of given medication give all information related to it ouch as the most common side effect. Nurses are responsible for teaching clients how to take their medication safely when they are discharged. [9]

Medication management requires the collaborative efforts of many health care providers. Once prescribed, pharmacists are licensed to prepare and dispense medications. Dietitians are often identifying possible food and drug interactions.[7]

Significance of the study:

Nurses play important role in client safety especially in the area of medication administration. The safe administration of medication is an important topic for current nursing researchers. To safely administer medication to clients, nurses need to know how to calculate medication doses accurately. They also need to understand the different roles that members of the health care team plays in the prescribing and administering of medication. Nursing process provided the frame work for nurses to organize their thoughts and is the foundation for medication administration.

Aim of the study:
The aim of the study was to assess the effect of health educational program on nurse's knowledge about drug administration and utilization through:
1. Assess nurse's knowledge about drug administration and utilization.
2. Develop and evaluate the effect of health educational program on nurse's knowledge about drug administration.

Hypothesis:

Nurse's knowledge will be increased post health educational program about drug administration and utilization.

Subjects and Methods:

Research design:

A Quasi- experimental design was used in conducting the study.

Setting:

The study was conducted at Suez Canal university hospitals at Ismailia city.

Sample size:

A purposive sample composed of 154 nurses to assess their knowledge and having the following inclusion criteria:

- Gender: both male and female.
- Responsible for drug administration.
- Their experience not less than one year.
- Accept to participate in the study.

Tools of data collection:

An interview questionnaire: composed of five parts:

- **The first part:** Entails data about general characteristics of the study nurses such as (age, education level, gender, experience, qualification and training).
- **The second part:** Entailed knowledge related to nurse's knowledge about drug administration such as, definition, types, methods of administration, factors affecting drug administration, safety measures, drug effectiveness factors, absorption, drug errors, toxicity, and interaction.
- **The third part:** composed of questions related to nurse's medication errors and how to prevent its occurrence.
- **The forth part:** concerning nurse's knowledge about role of patient, physician, pharmacist and nurse in drug administration.
- **The last part:** deal with the nurse's knowledge about drug utilization.

Field work:

The study started at February 2011 and ended at September 2011 (lasts about 6 months)

Health education intervention:

The intervention was developed through four phases as the following:

- **Assessment phase:**
  Pre-test to specify the nurse's knowledge "problems", determine the baseline of knowledge, and build up a health education intervention program.
- **Planning phase:**
  After determining objectives of the program, the content was selected after careful study of drug administration and utilization. The subject materials were organized according to priority of the need.

- **Implementation phase:**
  A health education intervention about drug administration and utilization has implemented for nurses who working in different hospitals departments and responsible for drug administration.
  The educational program was offered to the study group, the program duration was six months, they were divided into groups, and each group ranged 3-8 nurses according to their presence in the department. The program was divided into 6 sessions; each session took 30- 45 minutes and was applied twice per week.
- **Evaluation phase:**
  It done after six months after implementation of program used the pre-test tool to assess their knowledge post-program implementation.

Content validity of tools:

Test the content validity was done by group of experts in the field of community health nurses, medical surgical, pediatric and pharmacist. All recommended modifications were performed.

Pilot study:

A pilot study was carried on 10% nurses who responsible for drug administration and attended to Suez Canal university hospitals at Ismailia city, and those were included in the study subject sample. The sample was used to test applicability and clarity of the tool of data collection, and estimating the time needed for assessment, and intervention accordantly certain necessary modification was done.

Administrative and ethical considerations:

Permission to conduct the study was obtained by submission of an official letter issued from the Dean of the Faculty of nursing at Suez Canal University to the Hospital's administrator at Ismailia city.

The agreement for participation of the subjects was taken orally after the aim of the study explained to them, they were given an opportunity to refuse to participated, and also they were assured that the information would be confidential and used for the research purpose only.

Statistical design:

Data entry and statistical analysis were done using SPSS 14.0 statistical software package. The collected data were coded and entered in a data base file using the fox pro for windows program. After complete entry, data were transferred to the SPSS version 19. Program by the analysis was conducted applying frequency tables and cross tabulation. Proper statistical tests were used to find out the impact of program on nurse's knowledge, chi-squared (X^2) or fisher exact and Mc Neman 15, chi-squared were used when appropriate. Statistical significance was considered at P- value < 0.001.

Results:

Table (1): illustrates the demographic characteristics of the studied sample. According to the table, the mean age of the nurses was 24.25 ± 3.7 years. 96.8% of them were females and only 3.2% were male. The mean years of experience was 6.5 ± 3.6 years. Majority of nurses had diploma degree in nursing (93.5%), only 0.7 % graduated from Faculty of Nursing.

Figure (1): The figure clarifies that 59.1% of the studied nurses not attended any training courses about medication "drug administration".

Figure (2): It reveals that the majority of the studied nurses worked in medical department 71.84%, while the lowest number of nurses worked in ICU department.

Table (3): Shows low percentage of nurses' correct knowledge about drug storage and administration pre-program on according to the place of work. A significant improvement in nurses' correct knowledge for all items post intervention (P = 0.001) especially for drug storage (nearly all nurses (99.4%)), mentioned the correct knowledge about methods of drug storage.

Table (4): presents nurses' knowledge about patient's, physician, and pharmacist roles in drug administration. The results revealed a significant improvement in nurses' knowledge about their role about the role of other health team, in addition to patient's role in drug administration post program implementation (P < 0.001).

Table (5): Describes the nurse's correct knowledge about drug utilization in the hospital pre- post program, the results indicated that there was a significant improvement in nurse's knowledge post implementation of health education program about most common drugs, review history of pt medication, and complication of drugs. (P < 0.001) on the other side there was in significant improvement post program regarding other items of drug utilization.

Discussion:

Regarding to age of the current study revealed that the mean age of the studied nurses was 24.25 ± 37 years. And nearly all of them were female and had diploma degree and their years of experience were ranged from 1-20 year. The current study findings nearly in agree with several study findings [10-14]

The study findings revealed that the nearly two thirds of the studied nurses not attended training course regarding drug administration, lack of in service education program in hospitals might lead to occur of medication errors. This findings was in agree with Hebash and Joanna Briggs institute [11,15] who recommended that by educating and training of nurses could improve nurse's competence to prevent errors beyond the skills they had already accrued.

Concerning the place of most medications errors occurs, the results of current study show the most medication errors occur in surgical and medical departments. This may be because the majority of nurses worked in this departments, not attended any training in services education or training about medication.

This results goes in the same line with Hebash and Kapborg and Svensson [11,16] who recommended that medication errors associated with lack of appropriate policies, procedures, and protocols and lack of training and in service education program about how to prevent the occurrence of medication errors in addition to educated them about the purpose and right way of given medication.

Concerning to distribution of the studied nurses by their general characteristics and place of their work at hospital, the results revealed that the majority of nurses in different units their aged above twenty five years, had diploma degree and had no training course except in I.C.U department nearly three quarters had training course.

As regards to the nurse's correct answers about medication pre-post program, the present study showed that the majority of the studied nurses had inadequate knowledge regarding medication before implementation of the program, also the present study revealed that there was significant improvement in the knowledge of the nurses after the program implementation compared to the deficit knowledge before the program.

This findings may be related to the nurses hadn't any concerns regarding the importance of knowledge about medication, and there is no any follow up from the head nurses and supervisors to detect any deficiency in knowledge regarding the basics nursing duties. This result was in accordance to Hebash [11] who found that the majority of nurses had satisfactory knowledge about medication, due to nurses still new graduated and have fresh information about medication administration.

On the other side the present study findings in agree with Kopp et al., [17] who found that the one of the common causes associated with medication administration errors was lack of knowledge.

Drugs should be stored safely and appropriately in a suitable container in a safe position and drugs requiring refrigeration should be stored in the body of the refrigerator not in the door. [18]

As regards the nurse's correct knowledge about storage of drugs, patient protection & administration pre-post program, the present study revealed that the majority of the studied nurses had deficient knowledge regarding previous items before implementation of the program, but it was improved after implementation.

The present study finding goes in line with the previous studies conducing in Alexandria main hospitals El Shat by pediatric university. hospital in 2009, in Assuit university hospital in 2002 and in king Faisal hospital in Saudi Arabia in 2006 where reported the storage errors were found in many departments. [19,20,12]

The current study revealed that the nurse's knowledge regarding drug storage were deficient in medical,

pediatric and surgical units. This result showed a significant improvement after the program implementation among nearby all the studied participants. This findings were supported by Hebash [11] who that the majority of nurses in medical and surgical departments were unware of safe drug storage.

The findings of the present study illustrated that the majority of the studied nurse's knowledge about the role of the health team responsible about drug administration in pre-intervention program were inadequate or incorrect and showed highly improvement in post health education program and the difference was statistically significant. Similarly in the study conducted by Hebash [11] who emphasized that the majority of nurses had in adequate knowledge regarding their work in medication. Physicians play vital roles as they are the first individuals who can take steps to prevent medication errors in the medication use process. On the same way, pharmacists are active members of the patient care team, who responsible for overseeing the optimal, safe and cost effective medication therapy management.[21]

Regarding knowledge of the studied nurses about role of the health team responsibility toward drug administration pre-post program, the study showed that their were a deficient knowledge among the study nurses pre-program specially about the pharmacist and nurse's responsibility in injection routs (I.V. IM, ID, SC, IV infusion) in all departments and there was a significance statistical relation between the studied nurse's knowledge pre and post program. The study findings may be due to the nurses not attended any training courses during their work.

Concerning the knowledge of the studied nurses about drug utilization, the results of the current study showed that the majority of nurses had deficit knowledge about drug utilization, but their knowledge improved after implementation of the program.

This findings may be due to the nurses depend on physician written orders in patient's chart and her his job was to applied the physician order they hadn't the right for any comment on decision in this respect.

The present findings are congruent with other studies which their results reflects that the nurses don't understand the importance, actions and dangers of the medication they administer and the protocols can applied in medication safety.[11,13] Similar findings were also reported by several studies. [22- 27]

From USA and Japan reported that nurses had inadequate knowledge related to drug action, contraindication, interaction and administration and the poor knowledge of nurses was identified as a key factor in intravenous drug errors.

On the other side the study finding showed that all studied nursed had adequate knowledge about make sure that patient take medication. These finding agree with Bns [28] who reported that nurse's standards recommended that one nurse beings to prepare drugs for administration she should not leave patient until he/ she take medication.

Conclusion:
In light of the study findings, it is concluded that:
All studied nurses had low level of knowledge related to medication, uses, storage, responsibility of the health team as well as drug utilization. The implementation of health education program designed to respond to their

identified needs was successful in improving their knowledge after program. The results also revealed significant statistically relation between nurses' age, qualification and attended training course about medication and their knowledge related to medication uses, storage, responsibility of health team in drug administration and utilization post intervention.

Recommendations:

Based on the study findings the following recommendations are suggested:

1. Implementation of the developed health education program related to medication administration and utilization at all departments of Suez canal university hospitals.

2. Regular scheduled meeting time should be established with the quality assurance department to discuss and follow up the program objectives to be implemented as routine work for all hospital nursing staff.

3. Routine reporting about the incidence of medication errors.

4. Booster refresher in – service training course are needed to compensate for attention of knowledge gained.

5. Longer follow up studied are proposed to assess the impact of implementation of health education program about medication on the incidence of medication administration errors and patient's safety.

Table (1): Demographic characteristics of the studied sample (n = 154)

Characteristics of studied sample	Frequency (N = 154)	Percent %
Age :		
$\overline{X} \pm$ SD	24.25 $\pm$ 3.7	
Range	15 - 37	
Gender :		
Male	5	3.2
Female	149	96.8
Experience:		
$\overline{X} \pm$ SD	6.5 $\pm$ 3.6	
Range	1 -20	
Qualification:		
Diploma	144	93.5
High institute	9	5.8
University	1	0.7

Table (2): The nurses' correct answers about medication pre –post program (N=154)

Nurses' correct answers	Pre No	Pre %	Post No	Post %	P
▪ Definition of medication	68	44.2	154	100	< 0.001
▪ Classification	10	6.4	62	40.3	< 0.001
▪ Methods of given medication	5	3.2	146	44.8	< 0.001
▪ Factors affecting given medication	1	0.6	75	48.7	< 0.001
▪ Safe methods of medication administration	106	68.8	149	95.8	< 0.001
▪ Factor affecting drugs effectiveness	105	68.8	148	96.4	< 0.001
▪ Factor affecting absorption of medication	5	3.2	112	72.7	< 0.001
▪ Definition of analysis of medication	5	3.2	144	93.5	< 0.001
▪ Medication errors	63	40.4	149	96.8	< 0.001
▪ Drug toxicity	23	14.5	154	100	< 0.001
▪ Medication interaction	20	18.8	154	100	< 0.001

Table (3): The nurses' correct knowledge about storage of drugs, patient protection &administration pre-post program (N = 154)

The nurses' correct knowledge for right methods of	Pre No	Pre %	Post No	Post %	P
▪ Drug storage	29	18.8	153	99.4	<0.001
▪ Patient protection	43	10.0	154	27.9	<0.001
▪ Drug administration	49	10.0	154	31.8	<0.001

Table (4): The correct nurses' knowledge about the role of the health team responsible about medication in pre-post program

Nurse's correct knowledge about responsibility of :	Pre 154 No	Pre 154 %	Post 154 No	Post 154 %	P
▪ Patient's	116	75.3	152	98.7	<0.001
▪ Physician's	101	65.6	154	100.0	<0.001
▪ Pharmacist's	43	27.9	154	100	<0.001
▪ Nurse's responsibility about oral route	48	31.2	154	98.7	< 0.001
▪ injection route	46	29.9	154	99.4	<0.001
▪ Local route	54	35.1	154	100.0	<0.001
▪ Eye, nose, throat route	55	35.7	154	100.0	<0.001

Table (5): The nurses correct knowledge about the drug utilization in the hospital pre-post program (N=154)

| Nurse's correct knowledge about drug utilization	Pre N=154		Post N= 154		Sign
	No.	%	No.	%	
▪ The most common drugs	63	40.9	87	56.5	< 0.05
▪ The most common dose	13	8.4	24	15.6	> 0.05 NS
▪ Indications	15	9.7	16	10.4	> 0.05 NS
▪ Contraindication	5	3.2	9	5.8	> 0.05 NS
▪ Nursing care for side effects	3	1.9	7	4.5	> 0.05 NS
▪ Implementation of Health education about medication	34	22.1	115	75.2	< 0.001
▪ Review History of pt medication	52	34.2	103	67.8	< 0.001
▪ Complication of medication	53	34.4	98	63.6	< 0.001
▪ Make sure pt. take medication	154	100.0	154	100.0	> 0.005 NS
▪ yes in intervention in medication plan	12	7.8	142	92.2	> 0.005 NS
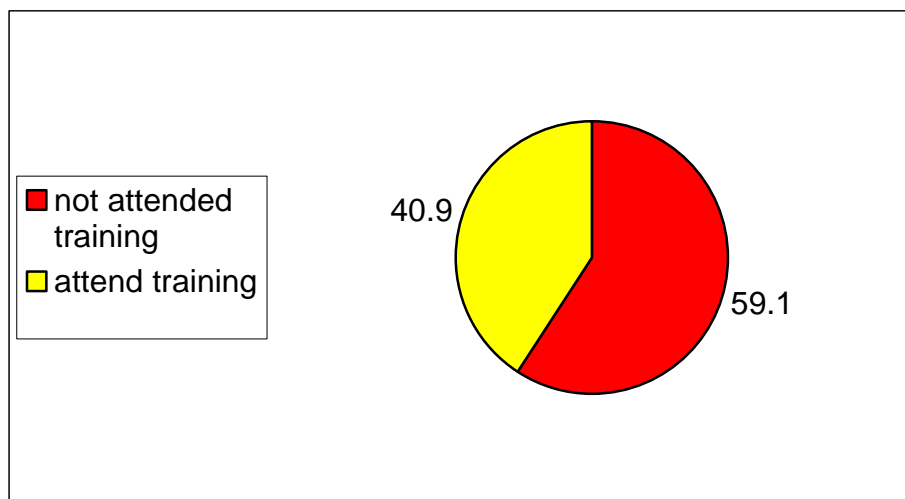
Figure (1): Percentage distributed of studied nurses by attendance of training course about medication
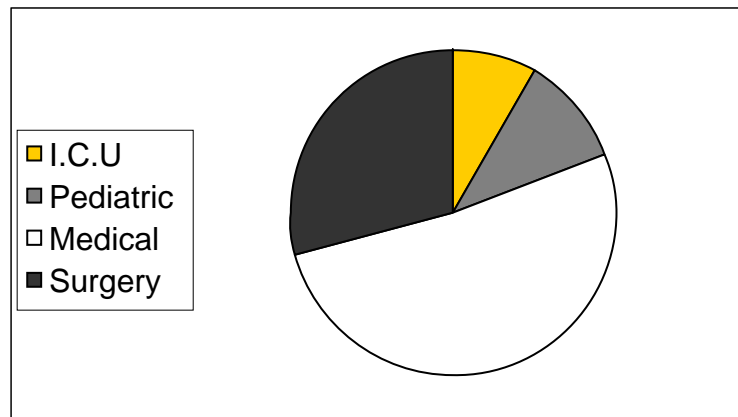
Figure (2): distributed of the studied nurses by their place work

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