

The Effect of Health Educational Intervention Program about Drug Administration and Utilization on Nurses Practice in Suez Canal University Hospitals at Ismailia City

Hanaa Kassem Farg⁽¹⁾, Salwa Abbas Ali Hassan,⁽²⁾ Hassan Ahmed El Shahally⁽³⁾ & Wafaa Abd El Azeem El Hossiny⁽⁴⁾

⁽¹⁾ Assistant lecturer of community health Nursing- Faculty of nursing- Suez canal university, ⁽²⁾ professor of community health nursing- Faculty of nursing- Zagazig University, ⁽³⁾ Professor of physical Medicine and Rheumatology & Rehabilitation -Faculty of medicine- Suez canal university, ⁽⁴⁾ Lecturer of nursing administration- Faculty of nursing- Suez canal university

Abstract:

Background: The administration of medication is often a chief responsibility of the nurse. The practice of administering medication involves providing the patient with a substance prescribed and intended for the diagnosis, treatment, or prevention of a medical illness or condition. **The aim** of the study was to assess the effect of health education intervention program about drug administration and utilization on nurses' practice. **Research design:** A Quasi- experimental design was used. **Sample:** A purposive sample composed of 154 nurses responsible for drug administration at different hospitals departments. Setting: suez Canal university hospitals at Ismailia city. **Tools:** an interview questionnaire composed of five parts, and observational check list were used. **Results:** of the current study revealed that the majority of the studied nurses had in adequate practice regarding drug administration. **Conclusion:** the health education and training program improve nurses practice regarding drug administration provides nurses with necessary education and training media about drug administration, and implement practice session for all nurses. **Recommendations:** Routine reporting about the incidence of medication errors. Booster refresher in-service training course are needed to compensate for attrition of knowledge and skills gained. Longer follow-up studied are proposed to assess the impact of implementation of health education program about medication on the incidence of medication errors and patient safety

Keywords: Drug administration, Drug utilization, Health education.

Introduction:

The administration of medication is often a chief responsibility of the nurse. The practice of administering medication involves providing the patient with a substance prescribed and intended for the diagnosis, treatment, or prevention of a medical illness or condition.⁽¹⁾

Preparation for medication administration begins with the order for medication, in most circumstances written by the physician. A record of orders for medication and other treatment is kept in the medical chart. All orders should contain the patient's name, the data and time when the order

is written, and the signature of the ordering clinician. Care givers administering medication are responsible for checking that these components are present and clear.⁽²⁾

On the same way ,the name of the medication is accompanied by the dosage, or how much of the drug should be given, the route of administration, or how the medication should be given, and frequency, or how often the drug is to be given.⁽³⁾

The most common routes of administration are the oral route, swallowing of medication. Patient may also receive medication by the buckle

route. Medication can also be instilled via the mucous membranes rectal or vaginal medication are most often given suppository form and must be introduced gently to avoid tearing or bleeding of tissue.⁽¹⁾

Nasal medications are often instilled via spray or drops and often involve closing one nostril and asking the patient to inhale gently. Inhalation medications are inhaled via the respiratory tract. Topical medications are applied to the surface of the skin.⁽¹⁾

Significance of the study:

Nurses play an 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 play in the prescribing and administering of medication. Nursing process provided the framework for nurses to organize their thoughts and is the foundation for medication administration.⁽⁴⁾

Aim of the study:

The aim of the study was to assess the effect of health education intervention program about drug administration and utilization through:

1. Assess nurse's practice about drug administration.
2. Develop and evaluate the effect of health education and training program for drug administration & utilization.

Hypothesis:

Health education and training program can improve nurses' practice regarding drug administration and utilization at Suez Canal university hospitals at Ismailia city.

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 who are responsible for drug administration to assess their practice regarding drug administration and utilization, 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:

(1) **An interview questionnaire:** Entails data about nurses' practice regarding different routes of drug administration.

(2) **Observation checklist (pre and post- test) :** An observation checklist was constructed from the nursing review. The observation checklist was required to assess the nurses, skill related to methods of giving medication: oral medication, injections, ENT,et.)

Scoring system:

The scoring system for the observation checklist consisted of giving one for the step done correctly, while the step not done was scored zero. The total score was) 12 points oral 18 point for I. V, injection 20 point for I.V infusion, 18 for I.M, 12 for I.D, 12 for S.C., 15 for Ear, 13 for Nose , 14 for eye medication) was calculated for each nurse by adding the scores of all items of the observation checklist. The performance of nurses was considered adequate in the percent

score was 60% or more and inadequate in less than 60%.

Content Validity of the tool:

Test the content validity by groups of experts in the field of community health nursing, medical surgical, pediatric and pharmacist. All recommended modifications were performed and tools were tested through pilot study.

Field work:

The study started at February 2011 and ended at September 2011 (lasts about 6 months). A review of the past, current literature using the available local and international books, magazines and periodical to be acquainted with the research problem, to prepare the data collection tools and program contents.

The education intervention program was offered to the study group, the program duration was six months, they were divided into groups and each group consists of 15 nurses. The program was divided into 15 sessions; each session took 30- 45 minutes and was applied three per week.

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.

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. 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 practice, 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): Reveals that a significant improvement in nurses performance post intervention related to their role in different routes of given medication (P < 0.001) in medical department.

Table (2): Clarifies that there were significant improvement in nurses' performance post intervention related to their role in different routes of given medication (P < 0.001) in surgical department.

Table (3): Shows that a highly significant improvement in nurses' performance post intervention related to there role in different routes of given medication (P < 0.001) in pediatric department.

Table (4): illustrates that a significant improvement in nurses' performance post intervention related to their role in different routes of given medication especially I.V medication

route (82.3%) ($P < 0.001$) in ICU department.

Table (5): Clarifies that there is a significant statistically relation between pre and post program implementation nurses' practice and their age, and practice of performance in different routes of given medication ($P < 0.001$).

Table (6): Reveals that present of significant statistically relation between nurses' qualification and there adequate performance pre-post program related to correct practice in given medication ($P < 0.001$).

Table (7): showed a significant improvement among the studied nurses. Correct knowledge about the responsibility of health team regarding medication post-program in all different department team ($P < 0.001$)

Table (8): Showed that there was a significant improvement in nurses' knowledge post implementation of health education about medication, review history of pt. medication, and complication of medication ($P < 0.001$) on the other side there was insignificant improvement post program regarding other items of drug utilization.

Table (9): As illustrated in table 9 a significant improvement in nurses performance post intervention related to their role in different items of given medication ($P < 0.001$) in medical department.

Table (10): Clarified that there were significant improvement in nurses' performance post intervention related to their role in different items of given medication ($P < 0.001$) in surgical department.

Discussion:

As regards to correct nurses' practice regards drug administration in different hospital departments, the present study revealed that, there was highly significant improvement in the practice of nurses after the program

implementation compared to the deficit practice before the program. This finding is in agreement with Hebash⁽⁵⁾ Mohammed⁽⁶⁾ ISMP medication safety Alert⁽⁷⁾ Joanna Briggs Institute⁽⁸⁾, who found that the majority of nurses lacked the basic practice about drug administration. This might be related to the fact that nurses weren't provided with enough information, whether written or verbal about rules, policy and responsibility about medication, also, nurses weren't attending training programs about medication administration.

Furthermore, nurses weren't supplied with medication administration supplies (cups, pill crushing device, and medication history sheet). Finally, lack of supervision from head nurses during preparation and administration of medication.

In addition to the above, the present study revealed that the most common practices deficiency regarding drug administration routs were in oral and injection routes. This agree with Hebash⁽⁵⁾ and El-Maged⁽⁹⁾ who found that majority of nurses have errors in general surgery, general medicine, where they didn't give oral medication by themselves.

This may be due to nurses in this units had chronic or stable patients. It may also be due to that nurses in these units believe that, parenteral medication is more important than oral medication.

On the same way the present study results regarding injection errors agree with Hebash⁽⁵⁾ Buckley⁽¹⁰⁾ Wirtz⁽¹¹⁾, who found that the nurses use wrong technique in administering I.M. injection. This also agrees with Taxis⁽¹²⁾ who reported that more than one third of administering bolus dose too fast.

On the same line with the present study those found in the military

hospital in Cairo in 1988, in previous studies also in Alexandria main university hospital in 2002 & 2005 and in El Shat by pediatric university hospital in Alexandria, 2009.

These findings are similar to those found by many studies conducted in Egypt that can to the conclusion that nurses had low performance for assessment of patient's condition.⁽¹³⁾

Conclusion:

In light of the study findings, it is concluded that all studied nurses had low level and inadequate practice related to drug administration.

The implementation of health education program designed to respond to their identified needs was successful in improving their practice after program.

The results also revealed significant statistically relation between nurses' age, qualification and attended training course about medication administration and practice.

Recommendation:

Based on the study findings the following recommendations are suggested:

1. Implementation of the developed health training program related to medication administration and utilization at all departments of Suez Canal hospitals with training of the patient health care personnel on their applicator.
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 skills gained.
5. Longer follow up studied are proposed to assess the impact of implementation of health education program about medication administration on the incidence of medication administration errors and patient's safety.

Table (1): Correct nurses' practice regarding drug administration in medical department

Medical department Correct nurses practice	Pre (N= 49)		Post (N= 49)		P- value
	No.	%	No.	%	
▪ Oral medication	13	25.5	39	79.6	<0.001
▪ Intra venous	11	22.4	39	79.6	<0.001
▪ Intra muscular	9	18.4	36	73.5	<0.001
▪ Intra dermal	16	32.7	40	81.6	<0.001
▪ Sub cutaneous medication	6	12.2	38	77.6	<0.001

Table (2): Correct nurses' practice regarding drug administration in Surgery department pre-post program

Surgical department Correct nurses practice	Pre (N= 63)		Post (N= 63)		P- value
	No.	%	No.	%	
▪ Oral medication	11	17.5	44	96.8	<0.001
▪ Intra venous	13	20.6	48	76.2	<0.001
▪ Intra muscular	14	22.2	52	82.5	<0.001
▪ Intra dermal	13	20.8	49	77.8	<0.001
▪ Subcutaneous	15	23.8	45	71.4	<0.001
▪ Eye, nose and throat medication	12	19.4	53	84.1	<0.001

Table (3): Correct nurses' performance regarding drug administration in Pediatric department pre-post program

Pediatric department Correct nurses performance	Pre (N= 24)		Post (N= 24)		P- value
	No.	%	No.	%	
▪ Intra venous medication & Intra venous infusion	6	25.0	14	58.3	<0.001
▪ Intra muscular	5	20.8	18	72.0	<0.001
▪ Oral	4	16.7	16	66.7	<0.001

Table (4): Correct nurses' practice regarding drug administration in ICU department

ICU department	Pre (N= 18)		Post (N= 18)		P- value
	No.	%	No.	%	
▪ I.V medication	6	33.3	15	83.3	<0.001
▪ I.M. medication	4	2.2	13	72.2	<0.001
▪ I.D. medication	4	22.2	12	66.7	<0.001
▪ S.C. medication	3	16.7	14	77.8	<0.001

Table (5): The relation between nurses' age and their adequate practice in different routes of given medication pre-post program.

Nurses' Adequate Correct practice	Age	Pre (N =63)				Post (N= 63)				P- value
		> 25 N= 54		< 25 N=100		> 25 N= 54		< 25 N=100		
		No.	%	No.	%	No.	%	No.	%	
▪ Oral		5	9.26	6	6	20	37.03	24	24	<0.001
▪ Intra venous		9	16.67	4	4	20	37.03	28	28	<0.001
▪ Intra muscular		9	16.67	5	5	20	37.03	32	32	<0.001
▪ Intra dermal		6	11.11	7	7	19	35.18	30	30	<0.001
▪ Subcutaneous		7	12.96	8	8	18	33.33	27	27	<0.001
▪ Eye		4	7.40	8	8	21	38.89	32	32	<0.001
▪ Nose		4	7.40	7	7	18	33.33	27	27	<0.001
▪ Throat		7	12.46	7	7	21	38.89	28	28	<0.001

Table (6): The relation between nurses' qualification and their adequate practice in given medication pre-post program

Nurses' Qualification Correct practice	Pre N= 63				Post N= 63				P- value
	Diploma N=144		Other N= 10		Diploma N= 144		Other N= 10		
	No.	%	No.	%	No.	%	No.	%	
▪ Oral	11	7.64	0	0	41	28.47	3	30	<0.001
▪ Intra venous	12	8.33	1	10	45	31.25	3	30	<0.001
▪ Intra muscular	13	9.02	1	10	50	34.7	2	20	<0.001
▪ Intra dermal	12	8.33	3	30	46	31.9	3	30	<0.001
▪ Subcutaneous	15	10.41	3	30	43	29.86	2	20	<0.001
▪ Eye medication	12	8.33	1	10	50	34.72	3	30	<0.001
▪ Nose	10	6.94	1	10	43	29.86	2	20	<0.001
▪ throat	14	9.72	0	0	46	31.9	3	30	<0.001

Table (7): The relation between nurses' training and their adequate practice in different routes of given medication pre-post program

Nurses' Training adequate Correct practice	Pre N= 154				Post N= 154				P- value
	Yes 63		No 91		Yes 63		No 91		
	No	%	No	%	No	%	No	%	
▪ Oral	5	7.93	6	6.59	18	28.57	26	28.57	<0.001
▪ Intra venous	9	17.28	4	4.39	19	30.15	29	31.86	<0.001
▪ Intra muscular	10	15.87	4	4.39	20	31.75	32	35.16	<0.001
▪ Intra dermal	8	12.69	5	5.49	20	31.75	29	31.86	<0.001
▪ Subcutaneous	10	15.87	5	5.49	19	30.15	26	28.57	<0.001
▪ Eye medication	7	11.11	5	5.49	55	89.30	31	34.06	<0.001
▪ Nose	8	12.64	3	3.29	17	26.98	28	30.76	<0.001
▪ throat	9	14.28	5	5.49	18	28.57	31	34.06	<0.001

Table (8): The relation between nurses' age and their adequate practice in different routes of given medication pre-post program

Nurses' Adequate Correct practice	Age	Pre N=63				Post N= 63				P- value
		> 25 N= 54		< 25 N=100		> 25 N= 54		< 25 N=100		
		No.	%	No.	%	No.	%	No.	%	
▪ Oral	5	9.26	6	6	20	37.03	24	24	<0.001	
▪ Intra venous	9	16.67	4	4	20	37.03	28	28	<0.001	
▪ Intra muscular	9	16.67	5	5	20	37.03	32	32	<0.001	
▪ Intra dermal	6	11.11	7	7	19	35.18	30	30	<0.001	
▪ Subcutaneous	7	12.96	8	8	18	33.33	27	27	<0.001	
▪ Eye	4	7.40	8	8	21	38.89	32	32	<0.001	
▪ Nose	4	7.40	7	7	18	33.33	27	27	<0.001	
▪ Throat	7	12.46	7	7	21	38.89	28	28	<0.001	

Table (9): The relation between nurses' qualification and their adequate practice in given medication pre-post program

Nurses' Correct practice	Qualification	Pre N= 63				Post N= 63				P- value
		Diploma N=144		Other N= 10		Diploma N= 144		Other N= 10		
		No.	%	No.	%	No.	%	No.	%	
▪ Oral	11	7.64	0	0	41	28.47	3	30	<0.001	
▪ Intra venous	12	8.33	1	10	45	31.25	3	30	<0.001	
▪ Intra muscular	13	9.02	1	10	50	34.7	2	20	<0.001	
▪ Intra dermal	12	8.33	3	30	46	31.9	3	30	<0.001	
▪ Subcutaneous	15	10.41	3	30	43	29.86	2	20	<0.001	
▪ Eye medication	12	8.33	1	10	50	34.72	3	30	<0.001	
▪ Nose	10	6.94	1	10	43	29.86	2	20	<0.001	
▪ Throat	14	9.72	0	0	46	31.9	3	30	<0.001	

Table (10): The relation between nurses' training and their adequate practice in different routes of given medication pre-post program.

Nurses' adequate Correct practice	Training	Pre N= 154				Post N= 154				P- value
		Yes 63		No 91		Yes 63		No 91		
		No.	%	No.	%	No.	%	No.	%	
▪ Oral	5	7.93	6	6.59	18	28.57	26	28.57	<0.001	
▪ Intra venous	9	17.28	4	4.39	19	30.15	29	31.86	<0.001	
▪ Intra muscular	10	15.87	4	4.39	20	31.75	32	35.16	<0.001	
▪ Intra dermal	8	12.69	5	5.49	20	31.75	29	31.86	<0.001	
▪ Subcutaneous	10	15.87	5	5.49	19	30.15	26	28.57	<0.001	
▪ Eye medication	7	11.11	5	5.49	55	89.30	31	34.06	<0.001	
▪ Nose	8	12.64	3	3.29	17	26.98	28	30.76	<0.001	
▪ Throat	9	14.28	5	5.49	18	28.57	31	34.06	<0.001	

References:

1. Aaos A Salmon, M. & pomerant, D.: *Paramedic: calculations for medication administration*. 4th ed. United states of America: Jones and Bateltt co, 2009; pp. 55-56
2. Ndosi M. & Newell R.: Nurses' knowledge of pharmacology behind drug they commonly administer. *Journal of clinical nursing*. 2008;18(4): 570-80
3. Berntsen, K.: Valuable lessons in patient safety: reporting near misses in health care. *Journal of Nursing care Quality*. 2004; 19 (3): 177-179
4. Curren, A. & Munday, L: *Dimensional analysis for meds* .2nd ed. Clifton park: Delmar learning. 2004; P: 239
5. Hebash ME: Evaluation of medication administration errors by nurses in Suez Canal University, Master thesis. Faculty of nursing, Suez Canal University; 2010
6. Mohammed N. & Gaber H: Quality improvement techniques to control medication errors in surgical intensive care units at emergency hospital. *Journal of medicine and biomedical science*, May, 2010. Issue 2, p24-35. 12p. 3 Charts, 5 Graphs.
7. ISMP medication safety Alert: Unit dose it's the gold standard for a reason. *Nurse advices ERR*. March's 2010; (3): 1-3.
8. Joanna Briggs Institue: Strategies to reduce medication errors with reference to older adults. *Nursing standard*; 2006, 20 (41): 53 – 57.
9. El-Maged N., El – Shamay A., Gaber E. & El Maghraby M.: Relation between work setting and the occurrence of medication errors among nurses of Assuit university hospital. *Assuit Med. J*; 2002; 26 (3): P 55 – 66.
10. Buckley MS. Erstad Bl., Kopp BJ, et al.,: Direct observation approach for detecting medication errors and adverse drug events in a pediatric intensive care unit. *Pediatric critical care med*; 2007; 8 (2): 145 – 52
11. Wirtz V., Taxis K. & Barber ND.: An observational study of intravenous medication errors in the united kingdom and in Germany; *Pharm World Sci*, 2003; 25 (3): 104 – 11
12. Taxis K & Barber N: Ethnographic study of incidence and severity of intravenous drug errors. *BMJ*; 2003; 326 (7391): 684 – 7
13. Ally N.: drug administration errors and their determinant in intensive care units of El – Shat by pediatric university hospital in Alexandria. Doctor at thesis of faculty of nursing university of Alexandria; 2009

