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A study to assess the occurrences of medication error in tertiary care in Rural area, Haryana

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Abstract
Medication errors can lead to adverse outcomes such as increased mortality, increased duration of hospitalization, and increased medical expenses. Error is a measure of the estimated difference between the observed or calculated value of a quantity and its true value. Errors are an integral part of human life. Many errors originate from the natural process of cognitive and behavioural adaptations which develop the correct behavioural skills, and cognitive skills are essential to administer the medication for safety of the patient.
Material and Methods: The quantitative research approach with exploratory survey research design was conducted during one month of December to January 2016.A total 496 events of medication administration via oral, intramuscular, intravenous, and subcutaneous route, from 39 staff nurses were observed through observational checklist in medical, surgical, obstetrical and gynaecological wards, during morning, evening, night shift and events were selected by event sampling technique.
Result: Majority of staff nurses were professionally qualified up to diploma. Maximum 42.7% medication error in obstetrical and gynaecological ward, followed by 38.8% errors were found in subcutaneous route of surgical ward, 35.1% and 34.2% error were found in intramuscular route of obstetrical and gynaecological ward. In transcribing error, 72.8% of medication errors were observed in oral route in evening shift of surgical ward, in monitoring error, 48.1% of medication errors were observed in intramuscular route in morning shift of obstetrical ward. There was no association observed in selected wards with selected variables. The findings shows medication errors were independent of personal and situational variables.

Keywords: medication error, occurrences, tertiary care

Introduction
Administration of medication is the most important nursing responsibility. Medication error is one of the factors causing death and harm to patients and it is a slight mistake in amount of preparing or administering the drug, In 2010, in England such studies indicate that although nurses prevent 48% of medication errors resulted from wrong prescription, whereas errors occurred at the time of giving medications, which consist 28% of the total errors, are usually made by nurses. Error is a measure of the estimated difference between the observed or calculated value of a quantity and its true value. Errors are an integral part of human life. Many errors originate from the natural process of cognitive and behavioural adaptations which develop the correct behavioural skills, and cognitive skills are essential to administer the medication for safety of the patient. Executions of medication orders are an important part of healing process and patient care. It is also the main component of nursing performance and has playing a prominent role in patient safety. Medication errors can significantly affect patient safety, treatment costs and result in hazards for patients or their families. Giving medicine to the patient is probably one of the most critical duties of nurses since the some errors may have unintended, serious consequences for the patient. Medication errors can lead to adverse outcomes such as increased mortality, increased duration of hospitalization, and increased medical expenses. It is reported by leaser *et.al*, it was reported that medication error occur 50 % for hospital patient. The most common factor which contributes to administration error are failure to check the patient identification prior to administration. In this pilot study, the quantative research approach with exploratory survey research design we analyzed the medication error and their potential outcomes in the selected wards with administering, monitoring, dispensing, and transmitting error, which was the primary objective. To assess the occurrence of medication error and find out the error with selected variables.

Material and Method
A quantitative research approach with exploratory survey research design in selected wards of MMIMSR Hospital and it has a 996 bedded multispecialty hospital situated in the campus of Maharishi Markandeshwar University, Mullana, Ambala. This hospital is also providing preventive, primitive and rehabilitative health services to the people residing in and around Ambala district. On an average, 300 - 350 patients are admitted as in patient under various wards to treatment for their minor ailments and major surgical procedure. A total 496 events including medication administration via oral, intramuscular, intravenous, and subcutaneous route, from 39 staff nurses were observed through observational checklist in medical, surgical, obstetrical and gynaecological wards, during morning, evening, night shift and events were selected by event sampling technique. data were collected in month of December 2015 to January 2016.
The data obtained in the study was analysed by using both descriptive and inferential statistics.

Result
Majority 75% of staff nurses were professionally qualified up to diploma. Table 1. Medication error occurrences were 33.2% indicating 9.57 errors per events out of total events

observed. Table:2. Maximum 42.7% medication errors were observed in oral route in medical, surgical, obstetrical and gynaecological ward, followed by 38.8% errors were found in subcutaneous route of surgical ward, 35.1% and 34.2% error were found in intramuscular route of obstetrical and gynaecological ward. Table: 3. there was no association observed in selected wards with selected variables.

Table 1: Frequency and percentage distribution of staff nurses according to selected Variables N =39

Sr. No.	Selected Variables	f	%
1.	Personal variable Professional Qualification		
	1.1 GNM	29	75.0%
	1.2 Basic Nursing	1	2.0%
	1.3 Post Basic Nursing	9	23.0%
2.	Duration of work experience		
	2.1 less than 2 years	28	71.7%
	2.2 3-6 years	11	28.3%
3.	Have you ever committed any medication error.		
	3.1 Yes	4	10.3%
	3.2 No	35	89.7%
4.	Have you attend any workshop on medication error.		
	4.1 Yes	0	0
	4.2 No	39	100%
	Situational variables Shift		
5.	5.1 Morning	14	35.8%
	5.2 Evening	13	33.5%
	5.3 night	12	30.7%
6.	Staff patient ratio in ward.		
	6.1 1:2	0	0
	6.2 1:10	37	94.8%
	6.3 1:5	2	5.2%
7.	Faced any interference while doing medication administration.		
	7.1 Yes	23	59.0%
	7.1.1 Phone Call	10	25.6%
	7.1.2 Patient Calling	9	23.0%
	7.1.3 Staff Interference	4	10.2%
	7.2 No	16	41.0%

Data presented in table 1 shows that total staff nurses were 39, Maximum of (75.0%) staff nurses were professionally qualified up to diploma. Maximum of staff nurses (71.7%) had experience less than 2 years. All the nurses (100%) had never attended any workshop related to medication error. As per shift practices of one third (35.8%) of staff nurses were observed in morning shift. Majority (94.8%) of staff nurse patient ratio were i.e. 1:10, more than half (59.0%) staff nurses had face Interference during the time of medication administration.

Table 2: Route wise frequency and percentage distribution of medication errors selected ward N=496

Routes	Items in observational checklist	n=124	Total Numbers of Step	Total Number of Correct Practices	Total Number of Incorrect Practices	
					f	%
Oral	21	124	2604	1490	1114	42.7
Intramuscular	33	124	4092	2711	1381	33.7
Intravenous	31	124	3844	2533	1311	34.1
Subcutaneous	30	124	3720	2778	942	25.3

Data presented in table2 shows that total 496 events were observed out of that 42.7% of medication errors were observed in oral route, followed by 34.1% and 33.7%of error were observed in intravenous and intramuscular route and minimum 25.3% of medication errors were observed in subcutaneous route

Table 3: Route wise and shift wise frequency and percentage distribution of medication errors N=496

Routes	Shifts	Items in observational checklist	Events observed n =124	Total Numbers of Step	Total Number of correct Practices	Total Number of Incorrect Practices	
						f	%
Oral		21					
	Morning		47	987	583	404	40.9
	Evening		38	798	422	376	47.1
	Night		39	819	485	334	40.7
Intramuscular		33					
	Morning		45	1485	964	52	35.0
	Evening		40	1320	889	431	32.6

	Night		39	1287	858	429	33.3
Intravenous		31					
	Morning		50	1550	1067	483	31.1
	Evening		41	1271	850	421	33.1
	Night		33	1023	616	407	39.7
Subcutaneous		30					
	Morning		48	1440	1083	357	24.7
	Evening		44	1320	1009	311	23.5
	Night		3	960	686	274	28.5

Data presented in table 4.3 depicts most of error 47.1% occurred in administration of oral route in evening shift, as followed by 40.9% and 40.7% error occurred in morning and night shift.

Table 4: Chi square value showing shift wise association between selected wards with selected variables. N=39

Selected Variables	Medical			Surgical			Obstetrical			Gynecology		
	df	x^2	P value	df	x^2	P value	df	x^2	P value	df	x^2	pvalue
Morning												
Professional Qualification 1.1 GNM 1.2 Basic Nursing 1.3 Post Basic Nursing	2	1.10	0.77^{NS}	3	1.40	0.97^{NS}	3	1.11	0.92^{NS}	4	2.29	.678^{NS}
Duration of work experience 2.1 less than 2 years 2.2 3-6 years 2.3 7-10years 2.4 >10 years	4	2	0.73^{NS}	1	0.43	0.63^{NS}	2	1.53	0.83^{NS}	4	2	0.93^{NS}
Staff patient ratio in your ward. 3.1 1:2 3.2 1:10 3.3 1:5 Evening	5	1:2	0.87^{NS}	5	4:43	6.63^{NS}	9	5	1.73^{NS}	2	1:4	0.77^{NS}
Professional Qualification 4.1GNM 4.2Basic Nursing 4.3 Post Basic Nursing	6	8.56	0.84^{NS}	12	12.5	0.28^{NS}	1	.32	0.57^{NS}	7	.73	0.74^{NS}
Duration of work experience 5.1 less than 2 years 5.2 3-6 years 5.3 7-10years 5.4 >10 years	2	1.23	0.26^{NS}	3	3.6	0.26^{NS}	4	2.23	.874^{NS}	2	2.43	.860^{NS}
Staff patient ratio in your ward. 6.1 1:2 6.2 1:10 6.3 1:5	4	3:1	0.63^{NS}	5	4;43	0.83^{NS}	2	4;53	1.87^{NS}	3	2:45	089^{NS}
Professional Qualification 7.1 GNM 7.2Basic Nursing 7.3 Post Basic Nursing	1	1.56	0.24^{NS}	2	2.5	0.28^{NS}	1	.42	0.51^{NS}	7	2.73	0.776^{NS}
Duration of work experience 8.1 less than 2 years 8.2 3-6 years 8.3 7-10years 8.4 >10 years	4	1.46	0.44^{NS}	1	1.3	0.48^{NS}	3	.22	0.31^{NS}	8	1.03	0.79^{NS}
Staff patient ratio in your ward. 9.1 1:2 9.2 1:10 9.3 1:5	8	3:1	0.71^{NS}	6	4:43	0.83^{NS}	3	4.53	1.87^{NS}	1	3:45	099^{NS}

Data presented in table 4.3 revealed that computed chi-square value showing that there was no association observed in selected wards with selected variables i.e. (professional qualification, duration of work experience, staff patient ratio). The findings shows medication errors were independent of personal and situational variables.

Discussion

The findings of the present study shows that, staff nurses had poor practices regarding administering of oral route in medical, surgical, obstetrical and gynaecological ward. These findings were consistent with the findings of the further study with the purpose to assess the nurses perception regarding medication errors, total 687 observations were made, out of that124 (18.0%) having at least one medication administration error. The most common error observed was wrong administration. The median deviation from the prescribed rate was higher. Errors was more likely to occur when administration of oral medications techniques was not used properly and as the quantity of the drug was higher**.**

The present study findings show that the maximum of medications error were observed in oral route of transcribing error (72.8%) in evening shift of surgical ward.

These findings were consistent with the findings of the further study with the purpose of assess the incidence of medication errors that relate the contributing factors involved in medication errors. The findings of the study show that the incidence of medication administration error was 199 (56.4 %) were found in nightshift. Maximum 87.5 % of medications error occurs in documentation error, as followed by wrong technique error 73.1 % and minimum of error occurred because of wrong time error 53.6 %. In our study, both experienced and non-experienced staff can make the medication error.

This study has certain limitations: firstly, That present study was confined to a single hospital setting. Thus this limits the generalization of the study. That improved practices scores of staff nurses regarding medication administration could be a result of direct observation of the researcher (Hawthorne effect).

Moreover, working environment of staff nurses, shift, duty hours, sleeping hours in night, should be addressed so, as to minimize the medication error.

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