

# The Effect of Pharmacy – Nursing Communication on Medication Administration Record (MAR) Accuracy: A Case Study of Medical Military Hospital

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## ABSTRACT

**Background:** Evaluation of Medication Administration Record (MAR) accuracy is a growing concern for hospital administration, pharmacy directors, nursing, and other health care provider. The independent variable included: 1-drug information communication, 2-prescribed order and 3- pharmacy system. One of the tools for evaluation is to generate a survey to end user and measure their feedback. **Objectives:** This survey evaluates factor that affect accuracy of Medication Administration Record (MAR) from nursing perception as they are the closest health practitioner to admitted patient in wards and they are the responsible for medication administration. **Methods:** This project employed a survey research design that acquired demographic and descriptive data. The survey contained 26 items including 20 scaled and six demographic items. Aspects assessed by this questioner included drug information communication, prescribed order and pharmacy system. 169 inpatient nurse practitioners, licensed practical nurses, and registered nurses who were employed at the hospital in the spring of 2016 were eligible to participate in the study. The a priori level of significance for all analysis was two tailed at 0.05. **Results:** A total of 162 surveys were returned for a response rate of 96%. Most of our sample female (86%) while male represent (14%). The registered nurse represent (94.4%). There is no significant relationship between drug information communication and prescribed order with MAR accuracy. But there is significant relation between pharmacy system and MAR accuracy. **Conclusion:** The data gleaned from the survey were evaluated in order to make recommendations to the PSMMC Director of Pharmacy. Implement effective pharmacy-nursing communication in Inpatient nurse station, create regular in service by pharmacist for nursing community, work on efficient medication delivery system (e.g. pneumatic system), start and implementation of electronic prescriptions, develop and improve pharmacy system.

**Key words:** Accuracy, Administration, Medication, Record.

## INTRODUCTION

### Preface

Since pharmacy is part of the work group, pharmacy-nursing communication can have a positive or negative impact on Medication Administration Record (MAR) accuracy. Communication at the pharmacy-nursing interface is fundamental in promoting a team attitude; pharmacists and nurses can set complementary objectives and jointly develop policies and procedures that will define their respective job duties. Many factors influence Medication Administration Record (MAR) accuracy such as: Accessibility of pharmacists, Friendliness of pharmacists, Automated medication dispensing system

restocking, Pharmacy telephone services, and drug information communication.

### Research Problem

The Medication Administration Record (MAR) is a part of a patient's permanent record on their medical chart. The MAR errors are main component for safety healthcare services. The need for accuracy in MAR is a must in the hospital, but still there is a problem in reaching 100% accurate MAR because of some factors contributing this problem such as poor communication in regard medication information, unclear prescribed order, insufficient pharmacy

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system to meet need of other health care professional (e.g. eMAR, automated prescription), in addition limited research study in MAR accuracy in Saudi Arabia.

### Research significance

This research has its scientific and practical importance, the scientific importance create from its enrichment of knowledge in the administration field in general and in the pharmacy administration specifically, as there is limited published studies in this topic which encourage me to do it.

From practical point, the result of the studies will contribute in finding the factors lead to inaccuracy in Medication Administration Record (MAR) of admitted patients, through measurement of nursing feedback on possible causes for that issue. The pharmacy director, policy maker, and planning sections shall use its findings in determine potential areas for Medication Administration Record (MAR) improvement.

### Research objectives

This research aim to determine the Medication Administration Record (MAR) accuracy as follow:

1. Analyze the Medication Administration Record (MAR) accuracy in the hospital.
2. Study factors that affect on the accuracy of patient Medication Administration Record (MAR).
3. Identify the level of Medication Administration Record (MAR) accuracy through hospital health worker.

### Research Hypothesis

1. There is a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.
2. There is a statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.
3. There is a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy

### Research terminology

#### Independent variable

#### Drug information communication

A daily communication practice between pharmacy and nursing regarding drug information, such as enquiries, contact, clarify, in-service about drug related issues (e.g, dose, side effect, indication, etc).

#### Prescribed order

A practice done by physician in hospital to give directions, either orally or in writing, for the preparation and administration of a medication to be used in the treatment of any disease.

#### Pharmacy system

Is the computer system used by pharmacy to enter all information related to medications given to patients. Also used by nurses to compare and resolve MAR discrepancy.

#### Dependent variable: Medication administration record (MAR)

A file maintained on hospital nursing units that documents the schedule and dosing of medications given to patients.

#### Literature review and previous study preface

Overview of previous research on distribution system, nurse's perception about pharmacy services, and medication administration records and their accuracy. It introduces the framework for the case study that comprises the focus of the research described in this study.

#### Distribution System

Hospital pharmacy departments are expected to optimize medication preparation, dispensing and distribution systems, and therefore, must develop comprehensive policies and procedure that provide safe distribution of all medications and related supplies to inpatients and outpatients (American society of hospital pharmacist, 1980). The American society of health- system pharmacist (ASHP) has conducted national surveys of pharmacy practice in hospital settings that pertain to dispensing and administration in 2002, 2005, 2008 (Pedersen *et al.*, 2003, 2006, 2009). The ASHP survey in 2008 showed that only 25.8% hospitals in U.S. used a medication distribution centered model (Pedersen *et al.*, 2009). A Canadian study also showed that centralized distribution system used in 70% of their hospitals (Hospital pharmacy in Canada editorial board, 2011).

In one study, a 54% reduction of medication administration error was observed following implementation of electronic Medication Administration Records (MARs) and Bar Coded Medication Administration (BCMA) (Paoletti *et al.*, 2007).

#### Nurses Perception about Pharmacy Services

Another study show increased levels of nursing satisfaction related to medication accuracy and In-Patient pharmacy working hours (Matthias *et al.*, 2006).

In one research report, nursing perceptions of consultant pharmacists in the long-term care, overall, nurses perceived the role of the consultant pharmacist in a positive manner (Yerondopoulos *et al.*, 2001).

In result of a survey, evaluating nurses' perception and expectations towards the role of pharmacist in Pakistan's healthcare system out of 266 nurses 60% of the nurses reported that they had once a day interaction with the pharmacist. 70% of the nurses expected the pharmacist to take personal responsibility for resolving any drug related problems. Moreover, they appear to have high expectations of the pharmacist, almost 90% regarded pharmacists as knowledgeable drug therapy experts, and almost two thirds of the nurses emphasized on counseling of patient by the pharmacist (Azhar, S.2012).

In a study held on two general and gastrointestinal surgery hospital wards in Canada to determine nurses' perceptions and expectations of clinical services prior to, and 9 months after, implementation of clinical pharmacy services. A survey tool developed based on previous research, validated to ensure reliability and accuracy of pharmacy services including accessibility of pharmacists, timely responses to drug related questions, and timely delivery of unit doses and intravenous admixtures. Nurses indicated that the quality of pharmacy service improved significantly from pre to post survey (85% versus 95%) (Chevalier, B. 2011).

Another study conducted at teaching institution (800 bed) in Canada show 5% poor rating from Physician and nurse perception for professional pharmacy services in medication administration records (MAR) (Peter J. 2004).

### Medication Administration Records and Their Accuracy

The records of 355 patients in outpatient clinics at Madison Veterans Administration Hospital were reviewed and compared with pharmacy files of the same patients. The records were evaluated for completeness and accuracy, with regard to the name of one or more medications prescribed by physicians, and 62% of the charts contained inaccuracies regarding dosage or directions (Monson, R. 1978).

A comparison of prescription and medical records study to determine the completeness of prescription records, and the extent to which they agreed with medical record medication entries for antihypertensive medications. It was held at three HMO clinics by pharmacy department at University of Washington.

Between 5 and 14 percent of medical record medication entries did not have corresponding prescription records. Further, 5-8 percent of dispensed prescription records

did not have corresponding medical record medication entry. Approximately 14 percent of medication records at one clinic and 21 percent of records at the other clinics had nonmatching dosage information (Christensen, D. 1994).

A prospective observational study of patients who require hemodialysis was conducted at University of Missouri-Kansas city, the dialysis clinic. The aim of study was to determine the extent to which medication record discrepancies occur in a hemodialysis population. Over the 5-month period, 215 medication interviews were conducted in 63 patients. One hundred thirteen medication record discrepancies were identified in 38 patients (60%). In the conclusion statement of study they said "incorporation of a pharmacist into the patient care team may increase the accuracy of medication record (Manley, H. 2012).

A study was conducted at a 1000-bed tertiary teaching hospital affiliated with the University of Toronto. From 151 patients they found eighty-one patients (53.6%) had at least 1 unintended discrepancy between the physician order and the pharmacist medication profile. The most discrepancy was on omission of a regularly used medication (Cornish, P. 2005).

Most of the above studies determine the accuracy of medication profile on outpatient setting or during patient admission, but our study will be on Inpatient setting. Chevalier, B *et al.* found that provision of clinical pharmacy in nursing unit improve services and accuracy in regard of medications which will be measure in our study under drug information communication and their relation to accuracy of medication profile. Cornish *et al* compare physician order to pharmacist medication profile for patients and found 53.6% discrepancy between them; also in our study we consider the physician order as factor affecting medication profile accuracy. Paoletti *et al* observed a reduction in medication administration errors by implementation of Electronic Medication Administration Records (eMARs) and Bar Coded Medication Administration (BCMA), and in our study, we consider the pharmacy system as factor contributing the accuracy of medication profile. In Saudi Arabia, a limited published studies assessing accuracy of medication administration record.

## METHODS

### Place where study conducted

The study conducted at Military Medical City.

### Population and sample size

The study population consist of nurses working in three building at PSMCC as shown below:

Nursing	Population
Building 2	100
Building 5	100
Building 3	100
Total	300

I use sa-mple size table were the sample size for popula-tion = 300, confidence = 95% and margin of error = 5%, **Sample size = 169.**

**Research method**

The research get approval of Research Ethics Committee (Reg.# HAP-01-R-015) under project No.: 777.

The data I need to collected are primary data and the best method to collected is creating a questionnaire as we have good sample size (nursing), plus the data needed is straightforward and is fairly simple, also we need standardized data through similar questions. There are no identical reference to use their questionnaire, that why I start creating close – ended questions to obtain predetermined responses; easy to count, standardize, and analyze; easy to use and interpret. A questionnaire containing 20 items divided in four aspects, with six demo-graphic questions. A 5-point response scale anchored with 1 equaling strongly disagree to 5 equaling strongly agree. The questioner divided as following:

**Demographic data**

**Drug Information Communication (IV)**

**Prescribed Order (IV)**

**Pharmacy System (IV)**

**Medication Administration Record (MAR) (DV)**

**Data Distribution and Collection**

The questioner will be distributed by nursing department at hospital and collected after 30 days by researcher.

**Methods of analysis**

Descriptive and inferential statistics were used to analyze responses to the items in SPSS software. The statistical analyses were two-sided with a significance level of 0.05.

1. Descriptive statistics.
2. Means and standard deviations.
3. Frequencies with percentages for all categorical variables.
4. Simple t-test to compare mean of variables.
5. Pearson correlation coefficient to find out if there is a relationship between independent variables and dependent variable.
6. Chi squares (X<sup>2</sup>) test was utilized for goodness-of-fit.

Table 2.1:	
Demographic	
A. Please mark the shift that you most commonly work:	days afternoon/evenings nights
B. Please write the unit where you typically work:	Ward: Building:
C. How many years have you been an (NP= Nurse Practitioner, RN= Registered Nurse, LPN= Licensd Practical Nurse)	■ NP ■ RN ■ LPN: _____
D. How many years have you worked for PSMMC: _____	
E. Please circle your age:	■ ≤24 ■ 25 to 34 ■ 35 to 44 ■ 45 to 54 ■
F. Gender:	■ M ■ F

Table 2.2:	
Drug Information Communication (IV)	
<ul style="list-style-type: none"> <li>• Please take a few moments to fill out this questionnaire.</li> <li>• Remember - your answers are strictly confidential.</li> <li>• For the following questions, please circle your responses using the following scale: 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree</li> </ul>	
1. The enquiries that I direct to the pharmacist on my unit about medications are answered completely	1 2 3 4 5
2. When I ask pharmacist on my unit about medications he answered in a	1 2 3 4 5 timely manner
3. I use the pharmacists as a source of drug information	1 2 3 4 5
4. I regularly contact the pharmacist for medication-related questions	1 2 3 4 5 about my patients
5. The drug information provided by the pharmacy is accurate	1 2 3 4 5
6. Pharmacists are helpful in clarifying ambiguous orders (dosage scheduling, drug compatibilities, drug indications, etc)	1 2 3 4 5
7. In-services conducted by pharmacy staff provide useful information	1 2 3 4 5

**Table 2.3:**

<b>Prescribed Order (IV)</b>				
<ul style="list-style-type: none"> <li>Please take a few moments to fill out this questionnaire.</li> <li>Remember - your answers are strictly confidential.</li> <li>For the following questions, please circle your responses using the following scale: 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree</li> </ul>				
8. New orders for routine medications are obtainable to administer after being ordered within two hours.	1	2	3	4 5
9. The STAT medication orders delivered by pharmacy in a timely manner	1	2	3	4 5
10. The present location to which medications are delivered makes for efficient retrieval	1	2	3	4 5
11. The medications I receive for my patients are correct (in regards to drug, strength, dosage form, etc.)	1	2	3	4 5
12. Medication errors due to a mistake made by pharmacy occur infrequently	1	2	3	4 5

**Table 2.4:**

<b>Pharmacy System (IV)</b>				
<ul style="list-style-type: none"> <li>Please take a few moments to fill out this questionnaire.</li> <li>Remember - your answers are strictly confidential.</li> <li>For the following questions, please circle your responses using the following scale: 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree</li> </ul>				
13. Availability of pharmacy system on my unit improves the quality of care for my patients	1	2	3	4 5
14. The time I spend solving medication administration record (MAR) system is minimal	1	2	3	4 5
15. I regularly see the MAR resolution updated on pharmacy system	1	2	3	4 5
16. I feel that the pharmacy system need more improvement	1	2	3	4 5

**Table 2.5:**

<b>Medication Administration Record (MAR) (DV)</b>				
<ul style="list-style-type: none"> <li>Please take a few moments to fill out this questionnaire.</li> <li>Remember - your answers are strictly confidential.</li> <li>For the following questions, please circle your responses using the following scale: 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree</li> </ul>				
17. The Medication Administration Record (MAR) of my patients are always accurate.	1	2	3	4 5
18. Sometime I have a discrepancy between prescribed order and Medication Administration Record (MAR).	1	2	3	4 5
19. The services that I obtain from the pharmacy on the weekends prevent Medication Administration Record (MAR) discrepancy.	1	2	3	4 5
20. I feel that the Medication Administration Record (MAR) accuracy need more attention from pharmacy administration.	1	2	3	4 5

## Reliability

The Cronbach's Alpha statistics shown in the following table:

<b>Independent Variables</b>	<b>Number Of Question</b>	<b>Reliability</b>	<b>Validity</b>
Drug Information Communication	7	0.87	0.93
Prescribed Order	5	0.82	0.91
Pharmacy Information System	4	0.744	0.86



## Fieldwork schedule

Timeline of study are 4 months, and from 1 April to 30 April 2016 for data collection.

## RESULTS

### Demographic Data

169 questioner distributed through nursing unit in hospital, the response rate of the study 162 out of 169 (around 96%). The following tables and figures show the demographic statistic of nursing population including:

#### Gender

Most of our sample female (86%) while male represent (14%). As shown in the following table.

**Table 3.1: Gender distribution by percentage**

Gender	Frequency	Percent
MALE	23	14%
FEMALE	139	86%
Total	162	100.0

#### Age Group

Highest age group in our sample was 25-34 years old (66.7%) then group aged 35-44 (18.5%). Nursing age in the studied sample mainly young population. As shown in the following table.

**Table 3.2: Age group distribution by percentage**

Age Group	Frequency	Percent
≤24	5	3.1
25-34	108	66.7
35-44	30	18.5
45-54	8	4.9
≥55	11	6.8
Total	162	100.0

#### Nurse Type

I classify the nursing to three category according to their title as follow: nurse practitioner (NP), registered nurse (RN), and licensed practical nurse (LPN). Most of our studied sample are registered nurse (94.4%). As shown in the following table.

**Table 3.3: Nurse type distribution by percentage**

Nurse Type	Frequency	Percent
NP*	5	3.1
RN*	153	94.4
LPN*	4	2.5
TOTAL	162	100.0

\*nurse practitioner (NP), registered nurse (RN), and licensed practical nurse (LPN)

## Shift Type

I classify the shift to three category according as follow: Day shift, Afternoon shift, and Night shift. Most of our studied sample are day shift (86.4%). As shown in the following table.

**Table 3.4: Shift type distribution by percentage**

Shift	Frequency	Percent
Day	140	86.4
Afternoon	9	5.6
Night	13	8.0
Total	162	100.0

## Likert Scales

The weighted average is used if the variable takes values differ in terms of their importance, so it must be taken into account by giving each phrase appropriate weight to its importance, and was given a weight of 1 to 5 that the answers reflect the following weights:

**Table 3.5: Likert scale weight**

Answer	Weight
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

In order to know to which category belongs sample answers, the answers included as shown in the previous table, and then the value of the weighted average of the sample answers on that account be a degree of approval or evaluation, as follows:

**Table 3.6: Weighted mean and their degree of evaluation**

Weighted Mean	Level	Evaluation
From 1.00 to less than 1.8	Strongly Disagree	Very Low
From 1.80 to less than 2.6	Disagree	Low
From 2.60 to less than 3.4	Neutral	Medium
From 3.40 to less than 4.20	Agree	High
From 4.20 to 5.00	Strongly Agree	Very High

It is noted that 3.4 is the minimum value for agree.

## Research Hypothesis Statistic

### Analysis of drug information communication effect on MAR accuracy

What is the effect of drug information communication on MAR accuracy?, to answer this question the following table show weighted mean and standard deviation for responder answers:

**Table 3.7: Analysis of drug information communication effect on MAR accuracy**

No.	Question	Weighted Mean	Standard Deviation	Evaluation	X <sup>2</sup>
1	The enquiries that I direct to the pharmacist on my unit about medications are answered completely	2.81	0.96	Medium	75.84
2	When I ask pharmacist on my unit about medications he answered in a timely manner	2.59	0.99	Low	75.16
3	I use the pharmacists as a source of drug information	2.85	1.01	Medium	59.61
4	I regularly contact the pharmacist for medication related questions about my patients	3.03	1.00	Medium	78.37
5	The drug information provided by the pharmacy is accurate	3.30	0.91	Medium	107.01
6	Pharmacists are helpful in clarifying ambiguous orders (dosage scheduling, drug compatibilities, drug indications, etc)	2.99	0.98	Medium	100.84
7	In-services conducted by pharmacy staff provide useful information	2.60	1.06	Medium	97.32
		2.88	0.98	Medium	

The above table show the level of drug information communication are medium overall. The following point had been noted:

1. In question (2) which represent (14.3%) of seven question, the response of pharmacist to nurse question in unit get low level (2.59), and standard deviation (99%) which mean the agreement of all responder on this level.
2. The nursing are not using pharmacist as the primary source of drug information as shown in question (3), and this because of availability of Micromedex online drug information.
3. Six question (85.7%) out of seven show medium level.

### First research hypothesis

There is a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.

**Null hypothesis  $H_0$** =There is no a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.

**Alternative hypothesis  $H_a$** =There is a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.

Pearson correlation coefficient was utilized to find out if there is a relationship between drug information communication and Medication Administration Record (MAR) accuracy. As shown in table (1) that  $r = .114$ ,  $n = 162$ ,  $p = .148$  which is greater than (.05) indicating no statistical correlation between the two variables (rug information communication and Medication Administration Record (MAR) accuracy). Therefore, we

**Table 3.8: Results of Person Correlation Coefficient (n=162)**

	Medication administration record	
Drug information communication	<i>r</i>	.114
	<i>Sig.</i>	.148 (p >.05)

\*significant at level .05

accept the null hypothesis that (There is no a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy) and reject the alternative hypothesis.

### 3.3.2 Analysis of prescribed order effect on MAR accuracy:

What is the effect of prescribed order on MAR accuracy?, to answer this question the following table show weighted mean and standard deviation for responder answers:

The above table show the level of prescribed order are nearly to medium overall. The following point had been noted:

1. In question (8) which represent (20%) of five question, the two hours to obtain new order for routine medication get low level (2.30), and standard deviation (100%) which mean the agreement of all responder on this level.
2. The nursing are not agree on receiving STAT medication order in a timely manner in question (9) and level was (low).
3. three questions (60%) out of five show medium level.

**Table 3.9: Analysis of prescribed order effect on MAR accuracy**

No.	Question	Weighted Mean	Standard Deviation	Evaluation	X <sup>2</sup>
8	New orders for routine medications are obtainable to administer within two hours after being ordered	2.30	1.06	Low	54.05
9	The STAT medication orders delivered by pharmacy in a timely manner	1.91	1.04	Low	105.72
10	The present location to which medications are delivered makes for efficient retrieval	2.71	1.02	Medium	71.27
11	The medications I receive for my patients are correct (in regards to drug, strength, dosage form, etc.)	3.33	0.96	Medium	72.51
12	Medication errors due to a mistake made by pharmacy occur infrequently	3.05	0.90	Medium	113.19
		2.66	0.99	Medium	

### Second research hypothesis

There is a statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.

**Null hypothesis  $H_0$**  = There is no a statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.

**Alternative hypothesis  $H_a$**  = There is a statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.

Pearson correlation coefficient was utilized to find out if there is a relationship between prescribed order and Medication Administration Record (MAR) accuracy. As shown in table (2) that  $r = .183$ ,  $n = 162$ ,  $p = .020$  which is less than (.05) indicating statistical weak positive correlation between the two variables (prescribed order and Medication Administration Record (MAR) accuracy). Therefore, we reject the null hypothesis and accept the alternative hypothesis that (There is a statistical

**Table 3.10: Results Of Person Correlation Coefficient (n=162)**

		Medication administration record
Prescribed order	<i>r</i>	.183*
	<i>Sig.</i>	.020 (p < .05)

\*significant at level .05

significance relationship between prescribed order and Medication Administration Record (MAR) accuracy)

### Analysis of Pharmacy System Effect on MAR Accuracy

What is the effect of pharmacy system on MAR accuracy?, to answer this question the following table show weighted mean and standard deviation for responder answers:

The above table show the level of pharmacy system effect are nearly to medium overall. The following point had been noted:

**Table 3.11: Analysis of pharmacy system effect on MAR accuracy**

No.	Question	Weighted Mean	Standard Deviation	Evaluation	X <sup>2</sup>
13	Availability of pharmacy system on my unit improves the quality of care for my patients	3.06	0.98	medium	62.51
14	The time I spend solving medication administration record (MAR) Discrepancies using pharmacy system is minimal	2.84	0.96	medium	68.49
15	I regularly see the MAR resolution updated on pharmacy system	2.96	0.92	medium	87.32
16	I feel that the pharmacy system need more improvement	4.44	0.97	Very high	232.26
		3.33	0.96	medium	



**Table 3.12: Results of Person Correlation Coefficient (n=162)**

		Medication administration record
Pharmacy system	<i>r</i>	.228**
	<i>Sig.</i>	.004 (p <.01)

\*\*significant at level .01

1. In question (16) which represent (25%) of four question, were pharmacy system need more improvement show the very high level among all questioner, and standard deviation (96%) which mean the agreement of all responder on this level.
2. Three questions (75%) out of four show medium level.

### Third Research Hypothesis

There is a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy.

**Null hypothesis  $H_0$**  = There is no a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy.

**Alternative hypothesis  $H_a$**  = There is a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy.

Pearson correlation coefficient was utilized to find out if there is a relationship between pharmacy system and Medication Administration Record (MAR) accuracy. As shown in table (2) that  $r = .228$ ,  $n = 162$ ,  $p = .004$  which is less than than (.01) indicating statistical weak positive correlation between the two variables (pharmacy system and Medication Administration Record (MAR) accuracy). Therefore, we reject the null hypothesis and accept the alternative hypothesis that (There is a statistical significance relationship between pharmacy system and Medication

## Administration Record (MAR) accuracy)

### Analysis of MAR Accuracy

The last part of statement was about Medication Administration (MAR) accuracy in nursing unit, the following table show weighted mean and standard deviation for responder answers:

The above table show the level of MAR accuracy are medium overall. The following point had been noted:

1. In question (20) which represent (25%) of four question, were MAR accuracy need more attention from pharmacy administration show the high level among all questioner, and standard deviation (91%) which mean the agreement of all responder on this level.
2. three questions (75%) out of four show medium level.

### Chi Squares ( $X^2$ ) Test

Chi squares ( $X^2$ ) test was utilized for goodness-of-fit. As shown in the tables (3.7, 3.9, 3.11, 3.13) that all chi squares ( $X^2$ ) values were statistically significant ( $P < 0.001$ ). Therefore, we can conclude that there are statistically significant differences in the frequencies of the sample towards all the statements of the four scales. Through the analysis and discussion of the previous data, researcher reached the following result:

1. The nursing are not using pharmacist as the primary source of drug information.
2. The level of communication between pharmacy and nursing in-between low and medium level.
3. Half of studied nursing mention that new orders for routine medications are not obtainable to administer within two hours after being ordered.
4. STAT orders are not reaching nursing units in a timely manner.

**Table 3.13: Analysis of MAR accuracy**

No.	Question	Weighted Mean	Standard Deviation	Evaluation	$X^2$
17	The Medication Administration Record (MAR) of my patients are always accurate.	3.08	0.84	medium	115.72
18	Sometime I have a discrepancy between prescribed order and Medication Administration Record (MAR).	3.29	0.88	medium	104.61
19	The services that I obtain from the pharmacy on the weekends prevent Medication Administration Record (MAR) discrepancy.	2.93	0.87	medium	124.17
20	I feel that the Medication Administration Record (MAR) accuracy need more attention from pharmacy administration.	4.03	0.91	high	95.72
		3.33	0.88	medium	

5. Half of studied nursing are spending more time in solving medication administration record (MAR) Discrepancies by using pharmacy system.
6. The present location of delivered medications need to be more efficient.
7. Most of studied nurses ask for pharmacy system improvement.
8. Most of studied nurses ask for pharmacy administration attention to MAR accuracy.
9. There is no statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.
10. There is statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.
11. There is a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy.

## DISCUSSION

Through the use of the survey instrument developed for this study, data were collected which addressed the research problems posed in the first chapter of this project.

The level of drug information communication are medium overall between pharmacy and nursing. The following point had been noted:

1. The response of pharmacist to nurse question in unit get low level.
2. The nursing are not using pharmacist as the primary source of drug information, and this because of availability of Micromedex online drug information.

There is no a statistical significance relationship between drug information communication and Medication Administration Record (MAR) accuracy.

The level of prescribed order are nearly to medium overall between pharmacy and nursing. The following point had been noted:

1. The two hours to obtain new order for routine medication get low level.
2. The nursing are not agree on receiving STAT medication order in a timely manner.

There is a statistical significance relationship between prescribed order and Medication Administration Record (MAR) accuracy.

The level of pharmacy system effect are nearly to medium overall between pharmacy and nursing. Most of nursing agree on that pharmacy system need more improvement.

There is a statistical significance relationship between pharmacy system and Medication Administration Record (MAR) accuracy

The level of MAR accuracy are medium overall between pharmacy and nursing.

## CONCLUSION

Based on the results of the research that conducted to explore the views of the nursing on effect of pharmacy – nursing communication on Medication Administration Accuracy (MAR), the following are recommendations of researcher:

1. Implement effective pharmacy – nursing communication in Inpatient nurse station.
2. Create regular in-service by pharmacist for nursing community.
3. Work on efficient medication delivery system (e.g. pneumatic system).
4. Start and implementation of electronic prescriptions.
5. Develop and improve pharmacy system.

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None

## CONFLICT OF INTEREST

None

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