Zagazig J. Pharm. Sci. Dec., 2014 ISSN 1110-5089
Vol. 23, Issue. 2, pp, 44-48

Prescriptions errors: a comparison of handwritten and computerized prescriptions at Royal Medical Services, Jordan

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ABSTRACT

Prescription errors are the most common errors of medical errors that may harm patients, so to decrease this problem computerized prescriptions are useful to be used instead of hand written, in this study we determine and compare the prevalence of prescription errors between handwritten and computerized prescriptions at Jordanian Royal Medical Services (JRMS). We conducted a retrospective comparative study in May, 2014 between two categories of prescriptions. First one was 500 handwritten prescriptions from Prince Zaid Bin Al-Hussein Hospital. The second was 500 computerized prescriptions from King Hussein Medical Center. Drug related errors were classified as serious and nonserious errors. Each prescription was carefully examined by same three pharmacists for errors.

The results show that the total number of errors in handwritten and computerized prescriptions was 220 & 40 respectively. Serious errors were not found in computerized prescriptions while 134 (26.8%) serious errors were recorded in handwritten prescriptions. The most common serious errors were dosage form not mentioned (11.6%) and drug strength not mentioned (6.2%). Other serious errors: wrong (illegible) drug name, overdose, under dose, and dose not mentioned, have almost the same occurrence (2-2.4%). The number of non-serious errors in computerized prescriptions was 40 (8.0%). Only two types of non-serious errors were recorded, absence of diagnosis (7.6%) and absence of prescribers signature (0.4%). In handwritten prescriptions, the four types of non-serious errors were recorded as follow: absence of prescriber signature (0.6%), absence of patient data (1.0%), absence of prescriptions date (7.8%) and absence of diagnosis (8%).

We conclude from this study that computerized prescriptions have enhanced patient safety through decreasing number of both serious and non-serious prescription errors when compared to handwritten prescriptions at JRMS. From this point of view, it is recommended to apply computerized prescriptions throughout all JRMS hospitals.

Keywords: errors, handwritten prescriptions, computerized prescriptions.

INTRODUCTION

There is a growing concern all over the world about the frequency with which patients are harmed by medical errors. Of all types of medical errors, prescription errors are the most common. While many errors are harmless, a number are potentially dangerous.

A prescription error is 'a failure in the prescription writing process that results in a wrong instruction about one or more of the normal features of a prescription (Aronson, 2009). The normal features of a prescription could be patient data such as name, age, medical insurance number. Other feature could be drug data such as identity, strength, dosage form and dose.

Jordanian Royal Medical Services (JRMS) like many other health organizations have the problem since thousands of prescriptions are written every day. Recently, JRMS started to use computers in prescribing in some of its health facilities.

Computerized prescription has many advantages. JRMS computer system enabled prescribers to see the last patients visit and drugs being prescribed. This can reduce drug duplication and thus promote rational prescribing. It can also reduce drug-drug interactions consequently enhance patient safety. In addition, computerized prescriptions are supposed to have lower incidence prescription errors, which will be shown in details in this study.

The aim of this study is to show the difference in the prevalence of prescriptions errors between handwritten and computerized prescriptions in two health facilities at JRMS.

MATERIAL and METHODS

This study is considered a retrospective comparative study between two samples of prescriptions. First sample was handwritten prescriptions taken from Prince Zaid Bin Al-Hussein Hospital while the second was computerized prescriptions taken from King Hussein Medical Center.

Five hundred prescriptions were randomly selected from the emergency department pharmacy of each health facility. Both samples were prescribed during May,, 2014. Every prescription was carefully examined by same three pharmacists for two types of errors. The first type was serious errors as it is drug related and could be life threatening. It included the following: wrong (illegible) drug name, drug strength not mentioned, dosage form not mentioned, overdose, under dose, and dosage not mentioned. The second type of errors, which was considered non-serious, included the following: absence of patient's data, diagnosis, prescriber signature, and prescription date. Errors were recorded on EXCEL sheet, which was used to calculate the percentage of each error, the subtotal and percentage of each type of errors and the total and percentage of all errors. This study was approved by human research ethics committee at RMS

RESULTS

Table 1 shows the prevalence of prescription errors in handwritten and computerized prescriptions.

Out of five hundred computerized prescriptions a total of (40) errors were recorded. on the other hand, the number of errors was about six times more in handwritten prescriptions.

It is clearly shown that serious errors were not found in computerized prescriptions. On the other hand, the total of serious errors per 500 handwritten prescriptions was 134 (26.8%). The most common serious errors were dosage form not mentioned (11.6%) and drug strength not mentioned (6.2%). Other serious errors have almost the same occurrence.

The total of non-serious errors in 500 computerized prescriptions was 40 (8.0%). only two types of non-serious errors were recorded, absence of diagnosis (7.6%) and absence of prescribers signature (0.4%). In handwritten prescriptions, the four types of non-serious errors were recorded. The least common were absence of prescriber signature (0.6%) and absence of patient data (1.0%). The prevalence of the rest two errors was comparable.

Table 1: prevalence of prescription errors in handwritten prescriptions (category A) and computerized prescriptions (category B):

No.	Prescriptions errors	Category (A) n=500	Category (B) n=500
A	Serious errors	Number of errors (%)	Number of errors (%)
1	*Wrong (illegible) drug name*	12.0 (2.4%)	0 (0.0%)
2	*Drug strength not mentioned*	31.0 (6.2%)	0 (0.0%)
3	*Dosage form not mentioned*	58.0 (11.6%)	0 (0.0%)
4	*Overdose*	10.0 (2.0%)	0 (0.0%)
5	*Under dose*	11.0 (2.2%)	0 (0.0%)
6	*Dose not mentioned*	12.0 (2.4%)	0 (0.0%)
	Subtotal	134 (26.8%)	0 (0.0%)
B	Non-serious errors		
7	*Absence of patients data*	5.0 (1.0%)	0 (0.0%)
8	*Absence of diagnosis*	40.0 (8.0%)	38.0 (7.6%)
9	*Absence of prescriber signature*	3.0 (0.6%)	2.0 (0.4%)
10	*Absence of prescription date*	38.0 (7.6%)	0 (0.0%)
	Subtotal	86 (17.2%)	40.0 (8.0%)
	Total of errors	220 (44%)	40.0 (8.0%)

DISCUSSION

There were no serious errors found in computerized prescriptions. This could be due to the fact that the prescribers have to choose drug name, strength, dosage form, and dose from the database. Choosing from database is much easier than writing such information. It helps deciding between different alternatives found in database. On the other hand, the incidence of serious errors in handwritten prescriptions ranged from 2.2% to 11.6%. The underlying reasons for these errors vary. These include high workload, poor knowledge, high number of drugs per prescription and simply forgetting. The most common serious error found in handwritten prescriptions was “dosage form not mentioned”. It was found that prescribers rely on the dose to clarify the dosage form. For example if the dose shown in milliliter, the dosage form is a liquid i.e. syrup, suspension, emulsions. However, many drugs share the same dose for different dosage forms such as creams and ointments of steroids and tablets and suppositories of some NSAIDS.

The prevalence non-serious among computerized prescriptions was lower than that in handwritten prescriptions. Absence of both patient data and prescription date were not found in computerized prescriptions. Usually, in JRMS, when patient data are missing, as seen in handwritten prescriptions, either it is filled by pharmacist or patient will be referred back to the prescriber to fill it. In both cases, it is a waste of time particularly for the patient. Prescriptions date is important especially in case of acute diseases. For example, it is useless to dispense analgesics for patients with common cold if his prescription was prescribed few days ago and his symptoms vanished. This can be detected by pharmacist and he will inform the patient that his prescription is no longer valid. Although the use of computerized prescriptions decreased the time spent by prescribers on writing the prescription, the prevalence of absence of prescriber signature was comparable to that found in handwritten prescriptions. For a prescription to be legal it has to be manually signed by the prescriber. A

common improper behavior is seen when prescriptions are signed by nurses or other healthcare workers. Disciplinary actions should be taken against those who practice such behavior. In addition, prescribers should be regularly reminded through verbal and written orders to check if they signed the prescription before handling it to the patients to minimize wasting of time. Furthermore, it was also found that the prevalence of "absence of diagnosis" in both categories was comparable. In both categories the prescriber has to manually write the diagnosis. The presence of diagnosis in prescriptions is valuable as it is checked by the pharmacist to make sure that it matches the drugs prescribed. Diagnosis is also used to check if drugs are prescribed according to their approved protocols and guidelines. Absence of diagnosis can be minimized if the diagnosis is added to database and prescriptions can't be generated unless it is added by prescribers.

In comparison to this study ,a study carried out in USA, the error rate was (2.3%) in handwritten prescriptions (Kenneth *et al*., 2002), in another study carried out to determine the nature of hospital prescribing errors ,from (587) errors detected in a one – month period , eight were potentially grave, (151) were potentially very serious, 351 were potentially moderately serious and (77) were comparatively minor, pharmacists detected 63 per cent of these errors (Dobrzanki *et al*., 2002), also It has been estimated that 40,000 Americans die each year as a results of medical error , these are rates of errors by handwritten prescribing, but the computerized prescribing were more than three times less likely to contain errors and five times less likely to require pharmacist clarification than handwritten prescriptions (Kenneth *et al*., 2002).

Although computerized prescriptions enhanced patient safety by decreasing both serious and non-serious prescriptions errors as shown in table-1, they have many limitations. These include high cost associated with constructing and maintaining the system. The success of computerized prescriptions relies entirely on the system software. The system should be able to retrieve data in case electricity went off. Lack of acceptance of computerized prescriptions by prescribers should be taken into consideration through involving them in the development process and establishing system training centers.

CONCLUSION

This study has shown that computerized prescriptions have enhanced patient safety through decreasing number of both serious and non-serious prescription errors when compared to handwritten prescriptions at JRMS. Therefore, it is recommended to apply computerized prescriptions throughout all JRMS hospitals. For other health care organizations, factors such as cost, efficient software system and lack of acceptance by prescribers should be taken into consideration by decision makers before applying computerized prescriptions.

ACKNOWLEDGEMENTS

Authors would like to thank Pharmacist Tareq Aljbouri, MSc in pharmaceutical services and medicines control, for his support and guidance.

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أخطاء الوصفات الطبية: مقارنه ما بين الوصفات المكتوبة بخط اليد مع الوصفات المحوسبه في الخدمات الطبية الملكيه- الاردن

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تزايد الاهتمام مؤخرا وعالميا بصحه المرضى ومن ضمن هذه الاهتمامات تقليل حدوث الاخطاء الطبيه التي يتعرض لها المرضى، الاخطاء بالوصفات الطبيه تعتبر احدى هذه الاخطاء والتي تتعرض لها الخدمات الطبيه الملكيه كسائر المؤسسات الطبيه الاخرى.
في هذه الدراسه تم عمل مقارنه ما بين الوصفات المكتوبة بخط اليد مع الوصفات المحوسبه في الخدمات الطبية الملكيه وذلك من خلال تقسيم الاخطاء في الوصفات الى اخطاء خطيره وغير خطيره.
النتيجه عززت سلامة المرضى باستخدام الوصفات المحوسبه بدلا من المكتوبه بخط اليد وذلك كون الاخطاء التي ظهرت بالوصفات المحوسبه قليله جدا مقارنه بالوصفات المكتوبه بخط اليد، (٤٠) خطا فقط من اصل (٥٠٠) وصفة محوسبة مقابل (٢٢٠) خطأ فقط من اصل (٥٠٠) وصفة مكتوبة بخط اليد .