

Hospital pharmacists' practice and perception toward dispensing errors and their potential causes in Omdurman Military Hospital, 2019

Introduction:

Dispensing errors are common in hospital pharmacies. Investigating dispensing errors is important for identifying the factors involved and developing strategies to reduce their occurrence.⁽¹⁾ Dispensing medication is the core function of pharmaceutical care and approximately 900 million medicines are dispensed each year by community and hospital pharmacies.⁽⁷⁾ Errors can arise at any stage during the dispensing process. ⁽¹⁾ The majority (85%) of these errors are detected by pharmacists before the medication is supplied to the patient. ⁽¹⁾ However, some errors are undetected and may cause serious patient harm and occasionally death. ^(9,12) Thus it is imperative that pharmacists review data on dispensing errors so that risk-reduction strategies are developed to safeguard the quality and safety of patient care. ⁽¹⁾

Dispensing error rates varied between countries depending on the dispensing system, research method, and classification of dispensing error types. The most frequent dispensing errors reported were dispensing the wrong medicine, dispensing the wrong drug strength, and dispensing the wrong dosage form. The most common factors associated with dispensing errors were: high workload, low staffing, mix-up of look-alike/sound-alike drugs, lack of knowledge/experience, distractions/interruptions, and communication problems within the dispensary team.

⁽²⁾ Dispensing errors were identified by checking the prescribed drug against the dispensed medication ⁽¹⁴⁾, this parallel to study conducted by Alaa and et al which found that 97.4% from pharmacists checked drug name in study conducted in Khartoum. ⁽¹⁷⁾

The dispensing errors were classified into types and subtypes according to the method of Beso et al. ⁽¹⁴⁾, with adaptations for the medication use processes in place at the study site. ⁽³⁾

Medication is the mainstay of health care. However, the risks of drug therapy and the prevalence of adverse effects have increased, most likely due to an increased number of medication errors. ⁽¹⁻³⁾ The pediatric population is known to be a high-risk group, and the number of potential adverse drug events is generally higher in pediatric inpatients than in the adult inpatient population. 4-6. ⁽⁴⁾

A study of five United Kingdom hospitals investigated the incidence and type of prescribing and administration errors in pediatric patients and found a 13.2% prescribing and a 19.1% administration error rate. ⁽⁶⁾ The need to calculate doses according to the age, weight, and body surface area of children increases the possibility of errors compared to adult patients.

^(8,9) Ambiguous, incomplete, or confusing prescriptions may result in incorrectly understanding drug prescriptions, which in turn can lead to problems in drug dispensing and administration. ^(10, 13) Researchers, health care professionals, and institutions have proposed action plans and mechanisms to decrease medication errors and increase patient safety. ⁽⁴⁾ Medication errors are common and often preventable. ^(1, 2) The hospital pharmacy's medication dispensing process is a source of medication errors and potential adverse drug events (ADEs). ⁽²⁾

³⁾ Hospital pharmacies in the United States each dispense hundreds of thousands to millions of

medication doses annually, and therefore even low dispensing error rates can generate many errors. Previous research also indicates that nurses only intercept 33% of serious medication dispensing errors before medication administration, so many of these errors could reach patients. Hospitalized patients are often critically ill, and many are susceptible to harm from these types of errors. Many previous studies of dispensing error rates reflect pharmacy dispensing patterns before the widespread use of automated dispensing cabinets, ^(5, 9) which are now commonly deployed by central hospital pharmacies to better control the distribution of frequently used medications on patient care units. ⁽⁵⁾

Dispensing medication is the core function of pharmaceutical care and approximately 900 million medicines are dispensed each year by community and hospital pharmacies across England and Wales. ⁽¹⁾ Dispensing is a complex process (Figure 1) ^(1,2) unequivocally under

the supervision of the pharmacist. ^(1,2) Traditionally, dispensing has involved pharmacy staff manually selecting medication from shelves, transferring the correct number of medication dose units to a container and/or labeling the assembled product. ⁽³⁾ However, in recent years the use of automated dispensing systems has been widely advocated to improve efficiency, maximize storage capacity and minimize dispensing errors. ^(4,5) Consequently, automated dispensing systems are becoming increasingly commonplace in hospital and community Pharmacies across the world. ^(4,8,6) The purpose of this study was to analyze the frequency and potential causes of dispensing errors in the hospital pharmacy of Omdurman Military Hospital, Khartoum State, 2019

Objectives:

The aims of this study are to discuss the underlying factors in dispensing errors, health care uncertainty and therapeutic outcomes, and to identify the extent of human- and system-based sources of errors by exploring hospital pharmacists' attitudes and dispositions to DE and uncertainties; and the implications for patient safety in a tertiary hospital.

Materials and Methods Study design

A cross sectional study involving 100 pharmacists who were administered a survey research inventory designed to assess pharmacists' attitudes, factors associated with DEs and involvement in DE and uncertainty on a variety of important dimensions.

Study area

The study conducted between 1st January 2019 and 1st February 2019 at Omdurman Military Hospital (OMH) Pharmacies located in Omdurman. It caters for over 80,000 in-patients and over 500,000 out-patients annually.

About 75% of the patients treated as outpatients and inpatients are residents of Khartoum through self-referral or referral from the public and private healthfacilities.

Sampling: 100 pharmacists in OMH pharmacies selected by simple random sampling technique.

Data collection, entry, analysis and presentation

A data collection form used to collect data and then analyzed using Statistical Package for Social Sciences software, version 21.0 (IBM SPSSInc., Chicago, IL).

Results:

57% from the participants in the study were aged less than 25 years old while the others aged 25 years and more. 80% from participants in the study were female while 20% were male, 40%

from the participants in the study, their experience less than 2 years while the others more than 2 years.

In area of attitude variables, high errors ratings were observed in dimensions of: committing dispensing errors (43% sometimes), reporting dispensing errors (37% rarely), supervising interns/ technician on dispensing errors (44% sometimes while 21% rarely), higher work pressure increase chance to DE (53% from pharmacists stated that usually it increase it), inter professional relations (31% from pharmacists stated that it was rarely), availability of information and structural and environmental effects. Clarification of difficult prescriptions with colleagues, use of technologies to reduce DE and staff inadequacy for the existing workload were rated low, all of which have implications for aggravating prescribing errors. 45% from pharmacist in the study had good attitude while 55% had poor attitude (figure1).

Figure 1: Represent the attitude score of the pharmacists toward dispensing errors

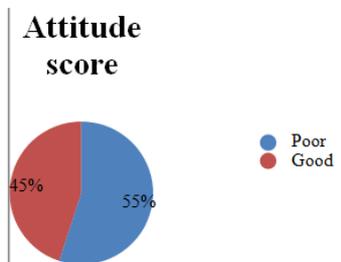


Table 1: Perception toward key factors that influence dispensing errors:

	Percent of participants
Inadequate drug knowledge and experience	
Inadequate knowledge of patient	
Inadequate perception of risk	
Overworked or fatigued health care professionals	
Physical and emotional health issues	
Poor communication between health care professional and with patient	
Patient characteristics	
Complexity of clinical case including multiple health conditions Poly pharmacy and high risk	
Workload and time pressures	
Distraction and interruptions	
Lack of standardized protocols and procedures	
Insufficient resources	
Issues with the physical work environment	
Naming of medicines	
Labeling and packaging	
Repetitive systems for ordering processing and authorization	
Patient monitoring	
Factors influence dispensing error	
Lack of therapeutics training	81%

In the area of factors associated with the health care professionals that may influence medication errors more than 50% of the pharmacist in the study stated that lack of therapeutic training (81%), inadequate drug knowledge (77%), inadequate perception of risk (51%), overworked or fatigued healthcare professionals (65%) and poor communications between healthcare professionals and with the patients (85%) were the most important factors in this area.

In the area of factors associated with patients that may influence medication errors more than 58% from pharmacists in the study stated that patient's characteristics (58%) and complexity of clinical case (63%) were the factors in this area.

In the area of factors associated with the work environment more than 53% from the pharmacists in the study stated that workload and time pressure (62%), distractions and interruptions by staff and patients (53%), lack of standardized protocols and procedures (76%) and insufficient resources (56%) were the most important factors in this area.

In the area of factors associated with medicines 54% from the pharmacists in the study stated that naming of medicines was the most important factor while 37% stated that labelling and packaging of medicines was the other factor.

On the other hand in factors associated with tasks less than 50% from the pharmacists in the study stated that repetitive systems for ordering, processing and authorization (34%) and patients monitoring (48%) were the factors in this area can lead to dispensing errors. (Table1)

48% from pharmacist participants stated that they get prescription with dispensing errors while other (52%) didn't get them. (Figure 2)

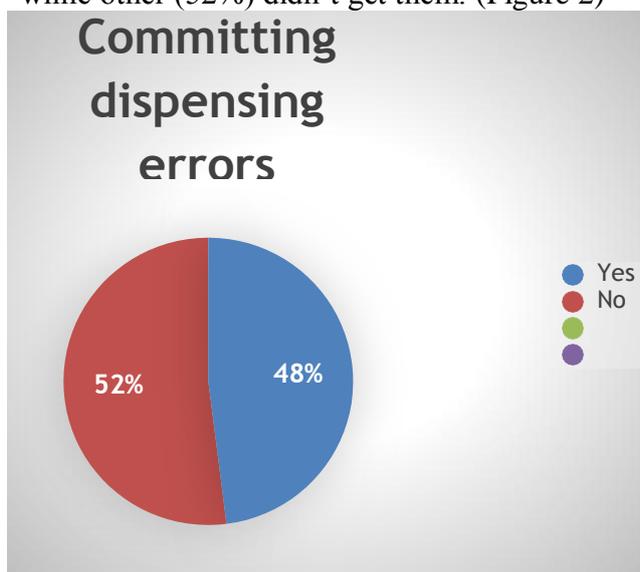


Figure 2: Represent the percent of prescriptions with dispensing errors

41.7% from participants stated that number of dispensing errors per prescription was one, 23% stated that was four or more, 18.8% stated that was three and 16.7% stated that the number of dispensing errors was two. (Figure 3)

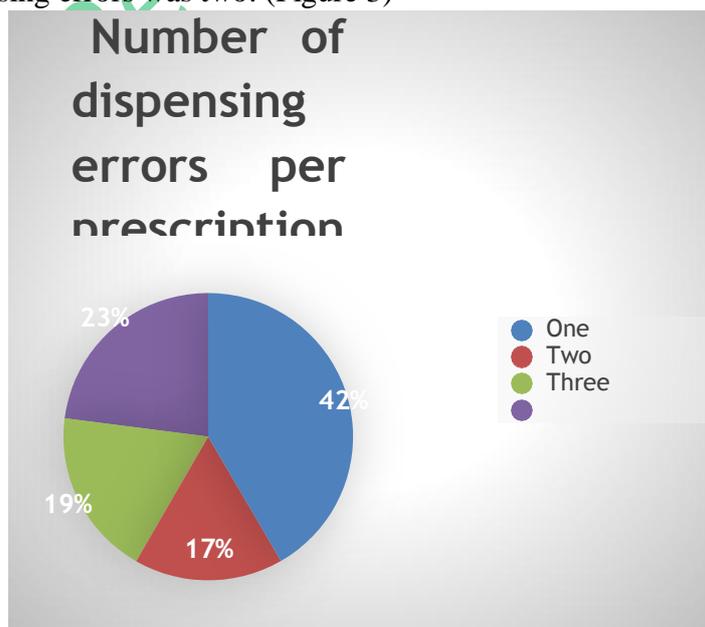


Figure 3: Represent the number of dispensing errors

In area of type of dispensing errors 60% of pharmacist stated that it was content type, 30% stated that labeling dispensing errors and 10% from pharmacists stated that documentation errors. (Figure 4)

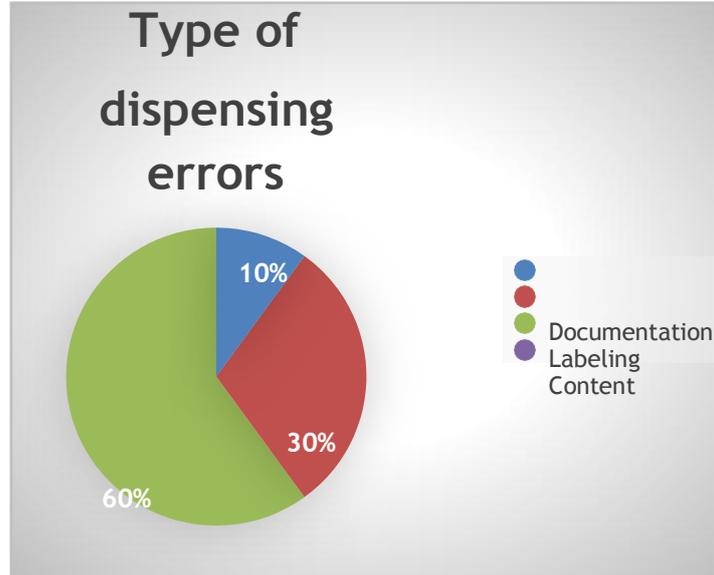


Figure 4: Represent the type of dispensing errors

Discussion

In area of demographic data, 57% from the participants in the study were aged less than 25 years old while the others aged 25 years and more. 40% from the participants in the study, their experience less than 2 years while the others more than 2 years. 80% from the participants were female.

In area of attitude variables, high errors ratings were observed in dimensions of: committing dispensing errors (43% sometimes), reporting dispensing errors (37% rarely), supervising interns/ technician on dispensing errors (44% sometimes while 21% rarely), higher work pressure increase chance to DE (53% from pharmacists stated that usually it increase it), inter professional relations (31% from pharmacists stated that it was rarely), availability of information and structural and environmental effects. Clarification of difficult prescriptions with colleagues, use of technologies to reduce DE and staff inadequacy for the existing workload were rated low, all of which have implications for aggravating prescribing errors. The attitudes of the pharmacists in the study concluded in that 55% from the pharmacists in the study have poor attitude toward dispensing errors, in a similar survey in Tasmania most of the pharmacists believed that the risk of dispensing errors is increasing and they suggested interventions for improvement like having a mechanism for dispensing procedures checking, checking the original prescription when dispensing repeats, keeping pharmacist knowledge up to date and counselling patient at the time of supply. ⁽¹⁹⁾

In the area of factors associated with the health care professionals that may influence dispensing errors, 81% of the pharmacist in the study stated that lack of therapeutic training influence in dispensing errors, this may indicate that workplace training during undergraduate, and internship

program may play a role to overcome this factor. 77% of participants stated that inadequate drug knowledge may cause dispensing errors, which can be solved by encouraging pharmacists to enroll in continuing professional educations during practice. 51% of participants stated that inadequate perception of risk may be a cause of dispensing errors, and this may be due to the lack of knowledge about wrong medicines hazardous effects to patients. 65% of participants stated that overload of work cause stress and fatigue to health care professionals leading to prescribing and dispensing errors, which need more attention from the director of the health facility to take care about the work schedule. 85% of participants indicated that poor communications between healthcare professionals and with the patients lead to error in prescribing and dispensing medicines, so the availability of counselling area in the pharmacy is very important for the pharmacist –patient communication to overcome any mistake, on the other hand communication with health care professionals is essential in providing efficient pharmaceutical care this could be through regular meetings and discussion with health professionals in the health facility.

In the area of factors associated with the work environment more than 62% from the

participants in the study stated that workload and time pressure are causes of dispensing errors, 53% of them stated that distractions and interruptions by staff and patients may lead to dispensing errors, while 76% of the pharmacists indicated that lack of standardized protocols and procedures cause dispensing errors and 56% of them mentioned the insufficient resources are reasons for dispensing errors, this parallel with Avery A et al⁽¹⁵⁾ and Slight SP et al⁽¹⁶⁾ studies except in the area of physical work environment e.g. lighting, only 25% from pharmacists in our study stated that physical work environment was a factor involved in medication errors. Generally organizing the work place and providing suitable environment in the hospital pharmacy have a great effect in reducing dispensing errors, especially proper lightening, temperature, and adequate counter spaces that facilitate the workflow. Dispensing medication to patients through a window by the pharmacy technician will help in minimizing distraction in the hospital pharmacy while the pharmacist provide patient consultation in the consultation area.⁽¹⁸⁾

Also the availability of standard operating protocols and procedures will improve the quality of the pharmaceutical service, and maintain proper guidance for junior pharmacists to follow.

In area of factors associated with patients in dispensing errors, 58% of participants in the study stated that the patient's characteristic's influence the occurrence of dispensing errors, that angry and nervous patients those came to the pharmacy made distraction and interrupted the pharmacist work. Also the complexity of clinical case (63% of participants) in which the prescription might contain more than 3 medicines, lead to pharmacist confusion.

In the area of factors associated with medicines 54% from the pharmacists in the study stated that naming of medicines was the most important factor while 37% stated that labelling and packaging of medicines was the other factor, this parallel to the work done by Avery A et al⁽¹⁵⁾ and Slight SP et al⁽¹⁶⁾ studies except in the factor of labelling and packaging of medicines which is important.

On the other hand in factors associated with tasks less than 50% from the pharmacists in the study stated that repetitive systems for ordering, processing and authorization (34%) and patients monitoring (48%) were the factors in this area can lead to dispensing errors this is parallel to study done by K. Lynette Jamesa et al⁽²⁾, they were identify sixty papers investigating dispensing

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