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ORIGINAL ARTICLE

# Interventions by pharmacists in out-patient pharmaceutical care

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**Abstract** Interventions by the pharmacists have always been considered as a valuable input by the health care community in the patient care process by reducing the medication errors, rationalizing the therapy and reducing the cost of therapy. The primary objective of this study was to determine the number and types of medication errors intervened by the dispensing pharmacists at OPD pharmacy in the Khoula Hospital during 2009 retrospectively. The interventions filed by the pharmacists and assistant pharmacists in OPD pharmacy were collected. Then they were categorized and analyzed after a detailed review. The results show that 72.3% of the interventions were minor of which 40.5% were about change medication order. Comparatively more numbers of prescriptions were intervened in female patients than male patients. 98.2% of the interventions were accepted by the prescribers reflecting the awareness of the doctors about the importance of the pharmacy practice. In this study only 688 interventions were due to prescribing errors of which 40.5% interventions were done in changing the medication order of clarifying the medicine. 14.9% of the interventions were related to administrative issues, 8.7% of the interventions were related to selection of medications as well as errors due to ignorance of history of patients. 8.2% of the interventions were to address the overdose of medications. Moderately significant interventions were observed in 19.4% and 7.5% of them were having the impact on major medication errors. Pharmacists have intervened 20.8% of the prescriptions to prevent complications, 25.1% were to rationalize the treatment, 7.9% of them were to improve compliance. Based on the results we conclude that the role of pharmacist in improving the health care system is vital. We recommend more number of such research based studies to bring awareness among health care professionals, provide solution

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to the prescription and dispensing problems, as it can also improve the documentation system, emphasize the importance of it, reduce prescribing errors, and update the knowledge of pharmacists and other health care professionals.



## 1. Introduction

The role of pharmacist has been diversified from dispensing medications to patient care, patient counselor, health care educator, and community service to clinical practice. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has recommended that all prescriptions must be reviewed by pharmacists before dispensing and stressed that the outcomes should be documented as a result of direct patient care by the pharmacy (Liya et al., 2003). Any error in ordering, transcribing, dispensing, administering and monitoring in the process of medication is called medication error (Kim and Schepers, 2003). Intervention by the pharmacist is warranted to detect these medication therapy problems, after which, solutions for these problems can be invented or drug therapy optimized for each patient. These interventions have developed by time and their forms, vary from the simplest handwritten form to the computerized databases (Kim and Schepers, 2003; US Food and Drug Administration, 2011). Furthermore, many of these problems can be prevented by educating health care providers about them (Bieszk et al., 2002).

Health care professionals expecting the pharmacists and pharmacies to have diversified responsibilities include monitoring medication for people with acute and chronic disease, operating repeat prescription services, reviewing medication for long-term users, prescribing under protocols, advising on the management of common conditions and participating in local and national health promotion or disease prevention activities (Felicity, 2009). Documentation of their interventions is important for justifying pharmacists' services to the patient, healthcare administrators and providers, patient care takers, to strengthen the profession and the society in total (Felicity, 2009). These clinical interventions of pharmacists not only have a positive impact on patient care but also decreased cost. Recently, electronic systems and commercially available products and software packages are used for documentation of clinical pharmacy interventions more efficiently than paper systems. However, most out-patient pharmacies do not have a central database for capturing interventions at experiential locations (Majumdar and Soumerai, 2003; Fox, 2011).

A study done in USA, 2001 showed that the majority of the prescriptions (76%) did not reach the patient, but had the potential to cause morbidity or mortality significantly, 22% were duplicate orders, 19% were wrong doses, 16% were wrong frequencies and other interventions contracted 19% (Kim and Schepers, 2003). An Australian study carried out in a teaching hospital indicates that 41.7% of the initial total interventions were excluded as they were considered as minor to moderate in significance that would be likely to improve the therapeutic outcome, without having a major impact upon the patient's health. The most common category of interventions was high dose errors, that constitute for 43.6% of the severe interventions (Alderman and Farmer, 2001). It has been proven that the clinical interventions improve adherence to national clinical practice guidelines and optimizing the pharmacy benefit for elderly. Interventions by the pharmacist in a psychiatric hospital showed that 64.5% of the interventions were of no significance, 24.2% of minimal clinical significance, 11.4% of clinical significance, and none was potentially life-threatening (Bosma, 2007; Bieszk et al., 2002).

The documentation of interventions by the pharmacist at the out-patient department of the Khoula Hospital has been started from 2009 and during this time many interventions have been made by the working pharmacists and assistant pharmacists. However, its impact on regular medical practice, patient safety and improvement in patient care is not known. In OPD, they still use the handwritten interventions, where pharmacists have to send the prescription back to the doctor with their comments in it, to clarify any unclear issues about the case or medications. Sometimes, interventions are done by calling the doctor. Importance of many pharmaceutical interventions by the pharmacist in an OPD pharmacy is unnoticed or unreported due to the lack of documentation. It was hypothesized that, these interventions by the pharmacists were more significant in clinical practice and patient care in reducing drug associated problems. Furthermore, we wanted to test if there is any association between pharmaceutical intervention, on the one hand, and prevention of complications, morbidity and improvement of cost and compliance, on the other hand.

The main aim of the study was to know the prevalence of different types of intervened medication errors, types of interventions, and action taken at OPD pharmacy in Khoula Hospital Muscat, Oman during 2009.

## 2. Methodology

### 2.1. Study design

The present study is a systematic retrospective study carried out by collecting the intervened prescriptions available at the Out-patient pharmacy of Khoula Hospital Muscat. It was conducted after an official permission obtained from the Director General of Khoula Hospital. All prescriptions of 2009 intervened by the pharmacist and filled in an OPD pharmacy were collected and included in the study. Utmost care was taken to include only those prescriptions which were intervened by the pharmacists and documented well by their comment on the prescription. The work experience of the staff, that used to do the interventions independently, varies from as low as 2 years to more than 10 years. All prescriptions that were illegible or the intervention done by the pharmacist was not clearly written, and any prescription that did not meet the inclusion criteria was excluded. Confidentiality of the information is maintained by not disclosing patient name, patient ID, name of the doctor who prescribed, and name of the pharmacist who did the interventions. British National Formulary, Oman National Formulary and Dipiro's Pharmacotherapy are used as standards to substantiate correct interventions by the pharmacists.