Emergency Department Visit Due to Medication Related Problems At Al-Hada Armed Forces Hospital: Cross-Sectional Study

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Abstract

Medication-related problems (MRPs) are widely defined as drug-related occurrences or conditions that actually or potentially interfere with planned health outcomes. The objectives of the study were to describe the baseline characteristics
and incidence rate for patients who experienced MRPs, and to assess and describe the degree of severity and preventability of these MRPs. The data was collected at the Al-Hada Armed Force Hospital’s ER department for three months using a specific data collection form. The findings highlighted the need to tackle MRPs in healthcare, especially in primary care settings. It highlights the significance of multicomponent interventions and comprehensive MRP-reduction approaches like medication reviews, automated information systems, education for healthcare providers and patients, and multicomponent treatments. Healthcare systems may enhance patient safety, cut healthcare costs, and increase overall care quality by addressing MRPs. Healthcare practitioners should prioritize regular and complete medication reviews for all patients, particularly in primary care settings. The use of computerized provider order entry (CPOE) systems with decision support should be encouraged. Continuous education and training programs for healthcare personnel, including physicians, nurses, and pharmacists, should be made available. Patients should be informed about the purpose of their prescriptions, correct administration, potential adverse effects, and the need for adherence. It is critical to foster a pharmaceutical safety culture inside healthcare institutions. Finally, establish procedures within healthcare institutions for continued monitoring of MRPs and related outcomes.

Keywords: Medication-related problems (MRP); Emergency; Medication; Signs and Symptoms; Preventability; Severity.

1. Introduction

Medications are provided by health-care providers all over the world. However, with increased drug use comes an increased risk of injury (Duerden et al., 2013). This is made more difficult by the necessity to prescribe for an aging population with increasingly complicated medical demands, as well as the introduction of several new drugs. These challenges are especially important in primary care. Prescriptions are often started in general care, and those started in the hospital may also be continued in primary care.
Medication-related problems (MRPs) are widely defined as drug-related occurrences or conditions that actually or potentially interfere with planned health outcomes (Vm et al., 2018). MRPs are at high risk during care transitions, which include patients traveling between acute and ambulatory care settings. According to studies, 15%-60% of patients experience at least one MRP during moving from hospital to home (Boockvar et al., 2006; Walker et al., 2009; Forster et al., 2005; Climente-Martí et al., 2010; Cornish et al., 2005). Adverse events caused by MRPs have the potential to have a significant influence on patient outcomes, including higher rates of hospital readmission (Forster et al., 2003).

According to the ENEIS 2 research, the number of hospital admissions caused by avoidable major adverse drug events (ADEs) accounted for 1.3% of all hospital admissions in France in 2009 (Michel, 2011). Medication reviews are regarded as an important component in enhancing prescription quality and reducing ADEs in hospitalized patients (Christensen and Lundh, 2016). A medication review is defined as a organized, critical assessment of a patient's medicines with the goal of achieving an agreement with the patient regarding treatment, optimizing the impact of medicines, minimizing the number of drug-related issues, and reducing waste (Clyne et al., 2008).

1.1 Research Problem

Industrial pharmaceutical and manufacturing of medication has expanded rapidly over the last decade. Advances have been made in medication therapy almost for all diseases; however, this associate with increase the risk of medication related problems (MRPs). Number of studies demonstrated that MRPs can be ranged from minor to very severe negative effects or death. MRPs are undesirable events or risks
experienced by patients that involve (or are suspected to involve) drug therapy and that inhibit or delay them from achieving the desired goals of therapy (Cipolle et al., 2004). The definition of an MRPs is wide-ranging and includes adverse drug reactions (ADRs; defined as noxious and unintended reactions occurring at doses used for prophylaxis, diagnosis or therapy) (Hallas et al., 1990; Cunningham et al., 1997), over- or under-dosing, untreated disease states, inappropriate medication, non-compliance, drug interactions and insufficient monitoring of treatment (Cunningham et al., 1997; Wood and Bain, 2001; Alghamdy et al., 2015; Westerlund and Marklund, 2009; Nelson and Talbert, 1996). A probability model in 2002 estimated that morbidity and mortality associated with MRPs account for $76.6 billion in hospital cost, 17 million emergency room visits, and 8.7 million hospital admissions annually in the United States (Al-Olah and Thiab, 2008; Anderson et al., 2002).

1.2 Research Questions

The problem of the current study can be summarized in the following questions:

1. What are the baseline characteristics and incidence rate for patients who experienced MRPs?
2. What are the degree of severity and preventability of these MRPs?
3. What is the effect of age, sex, and comorbidities on developing MRPs?

1.3 Research Objectives

The problem of the current study can be summarized in the following objectives:

1. To describe the baseline characteristics and incidence rate for patients experienced MRPs.
2. To assess and describe the degree of severity and preventability of these MRPs.

3. To examine the independent effect of age, sex, and comorbidities on developing MRPs.

2. Literature Review

2.1 Medication Errors

Much research has examined prescription mistake rates in hospitals, but data for general care is limited. Despite rising medicine use, this is especially true in low- and middle-income nations (IMS, 2016).

Because of the many definitions and categorization methods used, estimating the prevalence of pharmaceutical mistakes is challenging. Rates might differ based on the denominator (for example, patient, prescription, or drug). The difficulty is exacerbated by differences in healthcare system organization and the availability and utilization of event reporting systems (Inch et al., 2012).

These difficulties are evident in the substantially disparate mistake prevalence rates reported around the globe (Gandhi et al., 2003). A research in the United Kingdom, for example, discovered that 12% of all primary care patients may be affected by a prescription or monitoring error over the course of a year, up to 38% in those 75 and older and 30% in those getting five or more medications over the course of a year. Prescription mistakes were found in 5% of all prescriptions (Avery et al., 2012). A 42% medication mistake rate was discovered in a Swedish investigation. The omission to identify the objective of the therapy on prescriptions was responsible for two-thirds of the errors, and only 1% of errors resulted in an
inaccurate dose (Claesson et al., 1995). According to a Saudi research, around one-fifth of primary care prescriptions had mistakes, but only a tiny proportion were considered significant (Khoja et al., 2011). Another research in Mexico discovered 58% of prescriptions had mistakes, with dose regimen accounting for the majority of incidents (27.6%) (Zavaleta-Bustos et al., 2008). These instances demonstrate that pharmaceutical mistakes are a worldwide problem.

One systematic study took a different way to measuring mistake rates by categorizing pharmaceutical utilization procedures. The investigation discovered 3% mistake rates at the dispensing stage and 72% failure to examine repeat prescriptions at least once every sixth request. There were also issues at the intersection between primary and secondary care. Outpatient referrals to general practitioners had a 77% mistake rate, and inconsistencies in discharge medicine after hospitalization affected 43% to 60% of items (Garfield et al., 2009) showing disparities throughout care transitions. Overall, the proportion of significant pharmaceutical mistakes in primary care appears to be modest. However, considering the enormous volume of prescriptions written in primary care, there is still the possibility of causing significant harm in absolute terms.

Adverse medication responses, drug-drug interactions, lack of effectiveness, unsatisfactory patient adherence, and low quality of life and patient experience are all undesirable consequences. As a result, there may be severe health and economic repercussions, such as increased use of health services, avoidable medication-related hospitalizations, and mortality (Masotti et al., 2010). It is estimated that roughly 6-7% of hospital admissions in certain countries are medication-related, with more than two-thirds of these deemed preventable and hence potentially
owing to mistakes (Patel et al., 2007; Pirmohamed et al., 2004; Alexopoulou et al., 2008). Because of various risk factors, including polypharmacy (Chan et al., 2001), the issue is likely to be more severe in the elderly.

2.2 Causes of Medication Errors

A lot of research have looked at the elements that contribute to drug mistakes. A survey conducted by the Commonwealth Fund International Health Policy evaluated variables linked with patient-reported drug mistakes in seven countries. Poor coordination of care, cost-related obstacles to medical services or medications, multimorbidity, and hospitalization were risk factors in 11% of patients who had a medication mistake (Lu and Roughead, 2011).

Other studies have found that an increasing number of medications, childhood and older age, and specific medications and medications for specific disease states (e.g., musculoskeletal, oncology and immunosuppression, dermatology, ophthalmology, otolaryngologic conditions, infections, and cardiovascular) are associated with medication errors (Gandhi et al., 2003; Bourgeois et al., 2010; Guthrie et al., 2011).

2.3 Potential Solution

Several research have looked into approaches to enhance the quality of prescription in primary care. However, the consequences vary, and few studies have particularly focused on pharmaceutical mistakes. A systemic approach is required to reduce medication mistakes and improve drug safety. The examples in this section pertain to a few critical measures that can assist primary care physicians in decreasing drug mistakes and enhancing patient safety. Clinical pharmacists,
computer technology, and educational programs are among the strategies used, which are frequently integrated into comprehensive therapies. An emphasis is also placed on the elderly population. Some treatments have focused on specific clinical areas, such as infectious illnesses and antibiotic stewardship. Importantly, most interventions have been conducted in individual countries and may not be generalizable to countries with different health-care structures or levels of service (e.g., pharmacists) or technology (e.g., computerized provider order entry) (Williams, 2007).

1. Medication reviews and reconciliation

Medication review is a procedure of evaluating patients' medications in order to enhance health outcomes and reduce drug-related complications (Europe, 2016). A systematic review of 38 studies of primary care interventions designed to reduce medication-related adverse events discovered that the most successful interventions included a medication review conducted by a pharmacist or other clinicians, or were multicomponent interventions with a medication review conducted by a primary care professional as one component. According to research, pharmacist-led medication reviews minimize hospital admissions (Royal et al., 2006).

A meta-analysis of eight randomized trials looked at treatments to increase prescription for adults 65 and older living in nursing homes. Multidisciplinary care conferences, education, and clinical decision support were among the treatments. Medication reviews were included in seven of the eight trials. Overall, interventions improved medication-related issue identification and resolution, but
there was minimal evidence of cost-benefit and no indication of a reduction in adverse drug events, hospitalization, or death (Alldred et al., 2013).

Medication reconciliation is the formal process of creating and recording a consistent, precise list of medications throughout care transitions and then correcting any errors. Increased drug disparities at discharge are related to an increase in the number of prescription medicines, emphasizing the need of addressing polypharmacy as a complex danger to patient health (Hu et al., 2012). Medication information in discharge reports is generally inaccurate (McMillan et al., 2006).

Several pharmaceutical reconciliation solutions have been evaluated. Following hospitalization, these systems cope with new drug adjustments, deletions, and additions. According to a comprehensive evaluation, these systems decreased medication inconsistencies as well as prospective and actual adverse drug effects (Mueller et al., 2012).

2. Automated information systems

In half of the studies, an analysis of ten randomized trials with computerized treatments revealed a reduction in medication mistakes. Computerized provider order entry (CPOE) with decision support may be useful if focused at a small number of possibly unsuitable drugs and focuses on clinically relevant warnings (Lainer et al., 2013). There is strong evidence to support the use of CPOE in the inpatient context to reduce the incidence of medication mistakes. When an order was handled using CPOE, the risk of error incidence was reduced by 48% (Radley et
al., 2013; Forrester et al., 2014). However, further research is needed to correlate a reduction in medication mistakes to a reduction in patient harm.

42 trials in general care and the hospital environment were included in an evaluation of computerized medication dosage guidance. Some studies discovered advantages for certain medicine classes, such as anticoagulants and aminoglycoside antibiotics, but not for others, such as insulin, immunosuppressant transplant medications, or antidepressants. However, the majority of the studies (Reis et al., 2017) were of poor quality.

3. Education

Training health care providers is a critical component of improving primary care safety. This is especially true when it comes to decreasing pharmaceutical mistakes, since education is frequently part of multicomponent approaches. A analysis of 47 research revealed that training interventions to enhance antibiotic prescription and dispensing may influence physician behavior with increased adherence to recommendations (Roque et al., 2014).

There is little evidence on medication management education for patients, but it is an essential topic to investigate. Following sufficient teaching and preparation, a study revealed some evidence that patient self-administration of medicine can be as safe as or safer than standard treatment. The same analysis showed that patient-held personal health records frequently had a favorable influence on health outcomes, despite the possibility of a negative impact on equity (Pedersen, 2013).
4. Multicomponent interventions

Many research contain many interventions. The use of multiple approaches to improve medication practices is supported by evidence. A review of ten research on increasing the appropriateness of polypharmacy in the elderly found that nine of them used complicated treatments (the other used computer decision help). Overall, incorrect prescription and the number of adverse medication events (Hughes et al., 2014) were reduced.

A research to evaluate progress in improving medication usage investigated empirical evidence and ambulatory primary care practices in 104 low- and middle-income countries. One hundred and ten studies were found that used appropriate research design and evaluated treatments to enhance medication usage. Complex treatments that included education, provider monitoring, and community case management procedures were shown to be the most successful (Holloway et al., 2013).

2.4 Medication-Related Problems

The cost of outpatient adverse drug events is enormous for the health-care system. According to prospective studies, adverse medication events account for up to 12% of adult tertiary care emergency department (ED) visits (Capuano et al., 2004; Hohl et al., 2005; Malhotra et al., 2001; Trifirò et al., 2005; Zed et al., 2008). Understanding emergency doctors' attribution of adverse drug events to medication-related issues is critical for ensuring that prescription regimens are improved and patients and their care providers receive feedback, education, and
interventions that may help avoid recurrences (Nebeker et al., 2004; Kaboli et al., 2006).

Furthermore, understanding emergency physicians' ability to attribute adverse drug events to medication-related problems is required to understand the limitations of ongoing ED-based outpatient drug safety surveillance programs such as the National Electronic Injury Surveillance System-Cooperative Adverse Drug Event Surveillance project (NEISS-CADES), (Budnitz et al., 2005; Budnitz et al., 2006; Zhan et al., 2005). The purpose is to collect national ED data on outpatient adverse medication events in order to improve postmarketing surveillance of new pharmaceuticals and allow for the development of preventative interventions. NEISS-CADES and other surveillance projects rely on emergency physician diagnosis and reporting of adverse medication events and are hence relied on retrospective medical record analysis by skilled coders.

Hohl et al., 2005 investigated emergency physician recognition of adverse medication events in a small sample of high-risk elderly patients. Only 32% of adverse drug events unrelated to the patients' principal complaint were ascribed to medication use by emergency doctors, while 91% of adverse drug events leading to ED presentation were assigned to medication usage. Overall, 49% of adverse drug events were ascribed to medication-related issues by emergency doctors, implying that half of adverse drug occurrences went unreported when patients departed the ED. The results of this study, however, were restricted in their generalizability due to nonsystematic and nonrepresentative patient enrollment, as well as their limitation to geriatric patients, for whom detection rates may have been exaggerated due to a high frequency of drug-related issues.
Pharmacists have adopted broader definitions than physicians because they believe that narrow definitions miss easily treatable and preventable events caused by inappropriate prescribing, noncompliance, and sub- or supratherapeutic dosing, all of which pharmacists are trained to address, mitigate, and prevent, and for which effective pharmacist-led, ED-based interventions and other preventive recommendations could be developed (Hepler, 2001; Nebeker et al., 2004; Kaboli et al., 2006; Edwards and Aronson, 2000; Wu et al., 2006).

2.5 Medication-Related Problems categories

MRPs, which can occur at any stage of the patient’s treatment, is a problem that should be recognized and resolved or prevented by clinical health practitioners, and mainly by pharmacists, as it is considered that they have the most important responsibility and play the greatest role. The cause of the MRPs must be clearly understood; otherwise they cannot be resolved or prevented (Cipolle et al., 2004).

Strand and Hepler categorized all medication problems that patients may experience into seven types of MRPs (Table 1), which include any and all side effects, toxic reactions, treatment failure, or need for additive, synergistic, or preventive medication, and non-compliance. All these seven categories are associated individual drug related needs (Table 2) (Cipolle et al., 2004; Simonson and Feinberg, 2003).

<table>
<thead>
<tr>
<th>Table (1) Medication Related Problems categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- The drug therapy is unnecessary because the patient does not have a clinical indication at this time.</td>
</tr>
<tr>
<td>2- Additional drug therapy is required to treat or prevent a medical condition in the</td>
</tr>
</tbody>
</table>
patient.
3- The drug product is not being effective at producing the desired response in the patient.
4- The dosage is too low to produce the desired response in the patient.
5- The drug is causing an adverse drug reaction in the patient.
6- The dosage is too high, resulting in undesirable effects experienced by the patient.
7- The patient is not able or willing to take the drug therapy as intended.

Table (2) Translating drug-related needs into MRPs

<table>
<thead>
<tr>
<th>Drug-related needs</th>
<th>Categories of MRPs</th>
</tr>
</thead>
</table>
| Indication         | 1. Additional drug therapy  
|                    | 2. Unnecessary drug therapy |
| Effectiveness      | 3. Ineffective drug  
|                    | 4. Dosage too low |
| Safety             | 5. Adverse drug reactions  
|                    | 6. Dosage too high |
| Compliance         | 7. Non-compliance |

A number of studies were conducted in Saudi Arabia and world-wide either to evaluate, assist or measuring the incidence of MRPs. From an observational study that included 4093 hospitalized patients seen by the pharmacist, 265 (6.5%) of patients were admitted due to MRPs, while 178 (67%) of these were preventable.12 These patients were admitted to hospital as a result of preventable
MRPs that occurred due to different causes, including problems with prescribing in 63 cases (35%), monitoring in 46 cases (26%), and patients’ adherence to medications in 53 cases (30%). The most common medications related to the patients’ admission were NSAIDs, antiplatelets, antiepileptics, hypoglycaemics, diuretics, inhaled corticosteroids, cardiac glycoside, and beta-blockers. Ahmed et al, demonstrated that mortality incidence associated with MRPs in remote area hospitals found to be 3.8% from the overall death in general practices. In a retrospective study reviewed chart data to measure the incidence and causes of MRPs visit and hospitalisation showed that 2.9% of hospital admission and emergency visit were due to MRPs. Pharmacovigilance is the science and activities relating to detection, evaluation, understanding, and prevention of adverse reaction to medications or any other medicines related-problem. A national concern of medication safety was translated by establishing pharmacovigilance center by Saudi Food and Drug Authority (SFDA) in march 2009, which is responsible of collecting information about ADR occurrences in both hospital and community setting (Ahmed, 2014).

3. Methodology

In this prospective cross-sectional study, we will examine the rates of emergency visits and hospitalization due to MRPs, and examine the factors associated with or increase the risk of ER visits or hospitalization such as age, sex, and education level. The most common drug groups that may be associated with ER visits will also be examined.

Data will be collected at the Al-Hada Armed Force Hospital’s ER department for three months using a specific data collection form. The pilot study will be
conducted prior to the main study. The data collection form used in this study is the one used in an observational study conducted in the Prince Sultan Military Medical City (Al-Arif et al., 2014).

4. Analysis and Results

Table (3) Most common prescribed medication

<table>
<thead>
<tr>
<th>Medication</th>
<th>Frequency</th>
<th>Medication</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamins</td>
<td>14</td>
<td>Anticoagulant</td>
<td>4</td>
</tr>
<tr>
<td>Folic</td>
<td>10</td>
<td>Drug for Dm</td>
<td>35</td>
</tr>
<tr>
<td>Electrolyte</td>
<td>32</td>
<td>Thyroxine</td>
<td>4</td>
</tr>
<tr>
<td>cardiac glycoside</td>
<td>1</td>
<td>GI-medication</td>
<td>48</td>
</tr>
<tr>
<td>ARBs</td>
<td>8</td>
<td>Inhalers for asthma</td>
<td>10</td>
</tr>
<tr>
<td>ACEIs</td>
<td>13</td>
<td>antiepileptics</td>
<td>6</td>
</tr>
<tr>
<td>B-blockers</td>
<td>21</td>
<td>CNS disorder med</td>
<td>11</td>
</tr>
<tr>
<td>CCB</td>
<td>20</td>
<td>antibiotics</td>
<td>10</td>
</tr>
<tr>
<td>Duretics</td>
<td>19</td>
<td>Analgesics</td>
<td>16</td>
</tr>
<tr>
<td>Methylldopa</td>
<td>1</td>
<td>Oral corticosteroid</td>
<td>5</td>
</tr>
<tr>
<td>Hydralazine</td>
<td>1</td>
<td>Fingolimid</td>
<td>1</td>
</tr>
<tr>
<td>For BPC</td>
<td>5</td>
<td>Immunosuppressent</td>
<td>3</td>
</tr>
<tr>
<td>LLD (Lipid-lowering</td>
<td>26</td>
<td>Abuse subestance</td>
<td>2</td>
</tr>
<tr>
<td>medication)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiplatelet</td>
<td>30</td>
<td>Chemo-related therapy</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>359</strong></td>
</tr>
</tbody>
</table>
The study found that the medications most causing MRPs were GI-medications such as Pantoprazol, Lactulose, Simethicone, Biscodyl, Domperidone, Metoclopramide, Ondansetron, Ursodeoxycholic, and Mebavarin, the frequency of this medication was 48, The high frequency of MRPs associated with these medications could be due to issues such as improper dosing, drug interactions, or adverse effects. Followed by Drugs for DM such as metformin, metformin, Repaglinide, Glimepride, Sitagliptin, and Gliclazide, the frequency of this medication was 35, MRPs related to diabetes medications could include issues like hypoglycemia, inadequate control of blood sugar levels, or side effects. Followed by Electrolyte especially Calciferol which was repeated often, Frequent MRPs related to electrolyte medications might indicate issues with dosing or monitoring. Followed by Antiplatelet medication such as Clopidogrel and Ticagrelor, MRPs associated with antiplatelet drugs may involve concerns about bleeding risk, drug interactions, or inadequate platelet inhibition. Followed by Lipid-lowering medication such as Atorvastatin which is repeated often. Followed by B-blockers such as Bisoprolol, Carvidilol, Propranolol, and Atenolol, the frequency of this medication was 21, MRPs with beta-blockers may include problems with heart rate control, blood pressure management, or side effects. Followed by Calcium Channel Blockers such as Nifidepine, Trimetazidine, Isosorbid, and Nit.glyc.patch, the frequency of this medication was 20, MRPs associated with calcium channel blockers may include problems like as insufficient blood pressure management or adverse effects.
On the other hand the lowest medications causing MRPs was cardiac glycoside, Methyldopa, Hydralazine, and Fingolimod, where these medications are frequented once, they may be tolerated well or have fewer interactions, implying that they are well-tolerated. Moreover, the Abuse subestance was repeated twice. Additionally, Immunosuppresent and Chemo-related therapy medications were repeated three times, this might be owing to their complicated dosage regimes and the possibility of significant adverse effects. Furthermore, the Anticoagulant, and Thyroxine were repeated four times. For BPC and Oral corticosteroid medications repeated five times, revealing a modest frequency of MRPs, most likely due to dosage changes and adverse effects. Moreover, antiepileptics medication was repeated six times. While the ARBs repeated eight times.

Table (4) Descriptive statistics for the demographic variables

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Percentage</th>
<th>Men</th>
<th>Percentage</th>
<th>Women</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>29</td>
<td>100%</td>
<td>15</td>
<td></td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>52%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>48%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Age</td>
<td>57.6</td>
<td></td>
<td>57.3</td>
<td></td>
<td>57.8</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>20.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the results of the descriptive statistics analysis adult male made up 52% of the total adults in the sample, on the other hand, adult females accounted for 48% of the overall adults in the sample. This means that adult men and women develop MRPs at close together rates.
Medication-related problems were divided as follows, 61% of the patients have been diagnosed as definitely MRPs, and 32% of patients have been diagnosed as probably MRPs. The MRP most mentioned in the sample is untreated disease states, this sample represents 42%, and the percentage of women in this case was more than men where women represent 54%, and men represent 46%. Followed by non-compliance with doctor's instructions, this sample represents 26%, and the
reason for non-compliance with the doctor’s instructions was equal for males and females. Three patients have an ADR problem, and all of them are women. As well as the drug interaction problem, three patients have this problem two of them are men, and one woman. Overdose is one of the problems that patients face, all of them are men. Finally, Inappropriate medication appear one time in the sample.

In summary, our findings show the prevalence and variety of medication-related issues in the study group. They also show certain gender-specific variations in the prevalence of particular MRPs, which might be useful for customizing therapies and improving healthcare outcomes in this setting for both men and women. More research and treatments may be required to properly address these challenges.

Table (6) Sign and Symptoms

<table>
<thead>
<tr>
<th>Sign and Symptoms</th>
<th>Percentage</th>
<th>Sign and Symptoms</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigu</td>
<td>10%</td>
<td>Fever</td>
<td>2%</td>
</tr>
<tr>
<td>Testiculr pain</td>
<td>1%</td>
<td>Runny nose</td>
<td>1%</td>
</tr>
<tr>
<td>HEDACH</td>
<td>3%</td>
<td>Tremor</td>
<td>1%</td>
</tr>
<tr>
<td>Numbness</td>
<td>2%</td>
<td>Legs pain</td>
<td>1%</td>
</tr>
<tr>
<td>DIZINESS</td>
<td>5%</td>
<td>RT chondrial pain</td>
<td>1%</td>
</tr>
<tr>
<td>Unconscious</td>
<td>1%</td>
<td>Abdominal pain</td>
<td>5%</td>
</tr>
<tr>
<td>VOMITING</td>
<td>1%</td>
<td>Urinary retention</td>
<td>1%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>9%</td>
<td>Hematuria</td>
<td>1.3%</td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>1.1%</td>
<td>Inconttince</td>
<td>1%</td>
</tr>
</tbody>
</table>
### Table of Symptoms

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOB</td>
<td>2%</td>
<td>sore throat</td>
<td>1.3%</td>
</tr>
<tr>
<td>Cynosis</td>
<td>14%</td>
<td>Blurred vision</td>
<td>1%</td>
</tr>
<tr>
<td>Crepitation</td>
<td>1%</td>
<td>pruritis</td>
<td>1%</td>
</tr>
<tr>
<td>Horse voice</td>
<td>1%</td>
<td>ECG change</td>
<td>1.3%</td>
</tr>
<tr>
<td>COUGH</td>
<td>7%</td>
<td>Edema</td>
<td>1%</td>
</tr>
<tr>
<td>Yellow sputum</td>
<td>1%</td>
<td>Dehydration</td>
<td>1.3%</td>
</tr>
<tr>
<td>Chest pain</td>
<td>7%</td>
<td>Convulsion</td>
<td>1%</td>
</tr>
<tr>
<td>LT side chest pain</td>
<td>1%</td>
<td>Swelling</td>
<td>1.3%</td>
</tr>
<tr>
<td>Palpitation</td>
<td>2%</td>
<td>Swelling legs</td>
<td>1%</td>
</tr>
<tr>
<td>BACK PAIN</td>
<td>5%</td>
<td>RT loin Pain</td>
<td>1%</td>
</tr>
<tr>
<td>Flank pain</td>
<td>3%</td>
<td>LT facial nerve paralysis</td>
<td>1%</td>
</tr>
<tr>
<td>LT side weakness</td>
<td></td>
<td></td>
<td>1%</td>
</tr>
</tbody>
</table>

Sign and symptoms were mentioned in the sample in the following, Cynosis represents 14% of the overall sample, followed by Fatigu accounting for 10%, followed by Diarrhea which represents 9% of the sample. Moreover, the Chest pain accounted for 7% of the sample. Other sign and symptoms were also mentioned such as Testiculr pain, HEDACH, Numbness, DIZINESS, Unconscious, VOMITING, Epigastric pain, SOB, Crepitation, Horse voice, COUGH, Yellow sputum, Palpitation, BACK PAIN, Flank pain, Fever, Runny nose, Tremor, Legs pain, RT chondrial pain, Abdominal pain, Urinary retention, Hematuria, Inconttince, sore throat, Blurred vision, Pruritis ... etc.
Table (7) Preventability compared with gender

<table>
<thead>
<tr>
<th>Preventability</th>
<th>Total</th>
<th>percentage</th>
<th>Men</th>
<th>percentage</th>
<th>Women</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREVENTABILITY</td>
<td>27</td>
<td>87%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PREVENTABLE</td>
<td>20</td>
<td>65%</td>
<td>13</td>
<td>65%</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>POSSIBLY PREVENTABLE</td>
<td>7</td>
<td>23%</td>
<td>3</td>
<td>43%</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>NON-PREVENTABLE</td>
<td>2</td>
<td>6%</td>
<td>0</td>
<td>0%</td>
<td>2</td>
<td>100%</td>
</tr>
</tbody>
</table>

According to the preventability, the results show that 65% of MRPs preventable, while, 23% of MRPs are possibly preventable. On the other hand, just 6% of MRPs non preventable.

Table (8) Severity compared with gender

<table>
<thead>
<tr>
<th>Severity</th>
<th>Total</th>
<th>percentage</th>
<th>Men</th>
<th>percentage</th>
<th>Women</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEVERITY</td>
<td>29</td>
<td>94%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MILD</td>
<td>14</td>
<td>45%</td>
<td>5</td>
<td>36%</td>
<td>9</td>
<td>64%</td>
</tr>
<tr>
<td>MODERATE</td>
<td>7</td>
<td>23%</td>
<td>5</td>
<td>71%</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>SEVER</td>
<td>8</td>
<td>26%</td>
<td>5</td>
<td>63%</td>
<td>3</td>
<td>38%</td>
</tr>
</tbody>
</table>

According to the severity of the MRPs, 94% of the MRPs are severe. 45% of MRPs are mild severity, 23% of MRPs are moderate, and 6% of MRPs are sever.
Conclusion and Recommendations

The research looked into the significant issue of Medication-Related Problems (MRPs) and their influence on healthcare systems, particularly in basic care. The study shed light on the complexity of drug management by highlighting the prevalence of MRPs and the different variables connected with them.

The study discovered that MRPs are a serious problem in healthcare, impacting a considerable number of patients. These difficulties include excessive pharmaceutical usage, inadequate treatment, unpleasant drug responses, dosage mistakes, untreated medical disorders, improper medicine selections, drug interactions, insufficient monitoring, and noncompliance. These MRPs can have substantial repercussions, including as hospitalizations, ER visits, and negative health outcomes.

One important observation is the high frequency of MRPs in the studied population, which has a significant influence on healthcare use. Among the most prominent causes related with MRPs were drugs intended to treat gastrointestinal disorders, diabetic management, antiplatelet treatment, and lipid-lowering medications. The study also discovered gender differences in the frequency of particular MRPs, emphasizing the necessity for targeted therapies for both men and women.

The preventability and severity of MRPs were also investigated, and it was shown that a major part of MRPs are avoidable. MRPs ranged in intensity from low to severe, underlining the potential impact on patient health.
Overall, the findings emphasize the significance of addressing MRPs in healthcare, particularly in basic care settings. It emphasizes the importance of comprehensive MRP-reduction techniques, including as drug reviews, automated information systems, education for healthcare providers and patients, and multicomponent interventions. By addressing MRPs, healthcare systems may improve patient safety, lower healthcare costs, and improve overall care quality.

Finally, this research provides significant insights into the problems caused by MRPs in healthcare and underlines the significance of taking proactive actions to address these concerns. More research and actions in this area are critical for improving patient outcomes and healthcare delivery efficiency.

Several significant recommendations may be made to address this critical issue and improve patient care based on the data and insights offered in the research about Medication-Related Problems (MRPs) in primary care:

1. Healthcare practitioners should prioritize regular and complete medication reviews for all patients, particularly in primary care settings. To successfully identify and resolve MRPs, these evaluations should include pharmacists and other healthcare providers. Standardized standards for medication reviews can aid in ensuring consistency inpatient treatment.

2. The use of computerized provider order entry (CPOE) systems with decision support should be encouraged. These tools can assist healthcare practitioners in making more informed decisions, reducing pharmaceutical errors, and lowering MRPs. To guarantee that these technologies are used properly, organizations need invest in technology infrastructure and training.
3. Continuous education and training programs for healthcare personnel, including physicians, nurses, and pharmacists, should be made available. To minimize MRPs, these programs should emphasize best practices in pharmaceutical prescription, monitoring, and management. Special efforts should be taken to keep healthcare workers up to date on the newest pharmacological advancements and medication interactions.

4. Patients should be informed about the purpose of their prescriptions, correct administration, potential adverse effects, and the need of adherence. Patient participation and empowerment via education have been shown to greatly reduce noncompliance and, as a result, MRPs.

5. It is critical to foster a pharmaceutical safety culture inside healthcare institutions. Encourage the reporting and study of medication mistakes and MRPs in order to uncover systemic concerns and put preventive measures in place. In order to address medication-related problems, emphasize the necessity of open communication among healthcare professionals.

6. Establish procedures within healthcare institutions for continued monitoring of MRPs and related outcomes. Review and evaluate MRPs on a regular basis to discover trends and patterns that will enable for timely interventions and quality improvement activities.

In conclusion, resolving pharmaceutical-related problems is a complicated task that necessitates a diverse strategy encompassing healthcare personnel, patients, technology, and a commitment to a pharmaceutical safety culture. Implementing these ideas can help healthcare organizations minimize MRPs, improve patient care, and improve overall healthcare quality.
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