Drug Related Problems and Associated Factors among Psychiatric patients admitted to Jimma University Medical Center, Jimma, Southwest Ethiopia: Hospital Based prospective Observational study

BY: Goitom Mengistu (B.pharm)

A Thesis submitted to School of pharmacy, Institute of Health, Jimma University, in partial fulfillment of the requirements for Master of Science in Clinical Pharmacy

November, 2018

Jimma, Ethiopia

Jimma University

Institute of Health

School of Pharmacy

Drug Related Problems and Associated Factors among Psychiatric patients admitted to Jimma University Medical Center, Jimma, Southwest Ethiopia

BY: Goitom Mengistu (B.pharm)

Advisors:

Mr. Girma Mamo (B.pharm, MSc)

Mr. Habtemu Jarso (Bsc, MPH, Assistant Professor)

November, 2018

Jimma, Ethiopia

Abstract

Background: Patients with psychiatric disorder are at high risk of drug related problems, as they are prone to receive multiple medications. Drug related problems frequently occur in modern practice, cause considerable patient morbidity and mortality as well as increasing health care cost. In Ethiopia, drug related problems in psychiatric patients, as well as associated factors are not well studied.

Objectives: This study was aimed to determine prevalence of drug related problems and identify associated factors among psychiatric patients admitted to psychiatric ward of Jimma University Medical Center; Jimma, Southwest Ethiopia; 2018.

Method: A hospital based prospective observational study was conducted among psychiatric patients admitted to Jimma University Medical Center from March01 to August 30, 2018. A structured data collection tool were used to collect patient's specific data. Bivariate and multivariate logistic regression analysis was performed to identify the associated factors of drug related problems.

Result: A total of 135 study participants were included for analysis. Among the total in 100(74.1%) patients developed drug related problems. The average number of drug related problems were 1.61. The most commonly identified drug related problems, were need additional drug therapy 51(31.7%), ineffective drug therapy 35(21.7%), and adverse drug reactions 30 (18.6%). Factors independently associated with drug related problems were duration of treatment (>3 years) (AOR=18.2, 95% CI; 2.0-62.0), cigarette smoking (AOR=6.8, CI; 1.1-42.4), and poly-pharmacy (AOR=8.84, 95% CI; 1.46-23.5).Participants who resided in rural area had 68% lower than from those who resided in urban area (AOR=0.32, 95%CI; 0.10-0.98).

Conclusion and recommendation: Drug related problems were considerable among admitted psychiatric patient. Initiation of additional drug therapy, ineffective drug therapy, and adverse drug reactions were commonly identified drug related problems. In response to this finding, tailored future intervention that target in prevention and resolution of those problems could be vital.

Key words: Psychiatry, drug related problems, Jimma University Medical Center

Acknowledgements

I would like to express my greatest gratitude to my advisors; Mr. Girma Mamö (B.pharm, MSc) and Mr.Habtemu Jarso (Bsc, MPH, Assistant Professor) for their invaluable and unreserved guidance and constructive comments, and suggestion throughout the development of this thesis.

In addition i would like to express my sincerely thanks to Jimma University, Institute of Health, School of Pharmacy for giving me this chance and Axum University for sponsoring me to study master's degree. I also extend my special thanks to all the data collectors, participants, and other staffs in the psychiatric ward who helped me in facilitating of overall my study.

Table of Content

List of tables

List of figures

Abbreviations and acronyms

ADE	Adverse Drug Event
ADR	Adverse Drug Reaction
AOR	Adjusted Odds Ratio
APA	American Psychiatric Association
CI	Confidence Interval
COR	Crude Odds Ratio
DDI	Drug Drug Interactions
DRP	Drug Related Problems
DTP	Drug Therapy Problems
EPS	Extra-Pyramidal Side effect
FGA	First Generation Antipsychotics
JUMC	Jimma University Medical Center
OR	Odds Ratio
PCNE	Pharmaceutical Care Network Europe
SGA	Second Generation Antipsychotics
SPSS	Statistical Package for Social Science
SSRI	Selective Serotonin Reuptake Inhibitors
UAE	United Arab Emirates
WHO	World Health Organization

1. Introduction

1.1. Background

According to the World Health Organization (WHO) mental health is defined as, a "state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make contribution to his or her community*"* (1). Globally, 450 million people suffer from mental illness and nearly one million people commit suicide every year according to estimates in WHO report. Mental illness comprised 13% of the total global burden of disease in 2000, it is expected to rise to 15% in 2020. In Ethiopia, mental disorder is the leading non-communicable disorder in terms of burden. Indeed, in rural areas of Ethiopia mental illness comprised of 11% of the total burden with schizophrenia and depression the top ten most burdensome conditions, out-ranking Human Immune Virus Acquired Immune deficiency Syndrome (HIV/AIDS) (2). Mental disorder becomes silent crisis in Africa since higher priority was given to communicable disease and malnutrition with low attention to mental illness (3).

Medications used in mental disorder namely antidepressant, antipsychotics, sedative & anxiolytics, and lithium salts have an important role in the management of mental illness but they can also cause significant adverse effects (4). Psychiatric patients are at significant risk for drug related problems (DRPs) as compared to other medical conditions as a result of multiple risk factors, such as poly pharmacy commonly applied by multiple prescribers, several co-morbidities and inadequate adherence (5).

Drug related problem is defined as, an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes (6). DRPs are harmful and they arise at all stages of medication process for many reasons such as, poor drug selections, inappropriate drug combination, drug interactions, harm caused by adverse drug events(ADEs), under use of proven drugs, and issues with the way in which the patients uses the drug (7).

Drug related problems can be classified in to various categories based on different literatures. To date, there is no consensus and uniform classifications of DRP(8). However, according to Robert J.Cipolle text book of pharmaceutical care, there are seven categories of DRPs. All DRPs are categorized into seven types as described below (9)(table 1).

Table 1: Drug related problems classification & description

Types of drug related problems	Description
1. Unnecessary drug therapy	The drug therapy is unnecessary because the patient does not have a clinical indication at this time
2. Needs additional drug therapy	Additional drug therapy is required to treat or prevent a medical condition in the patient.
3. Ineffective drug	The drug product is not being effective at producing the desired response in the patient.
4. Dosage too low	The dosage is too low to produce the desired response in the patient
5.Adverse drug reaction	The drug is causing an adverse reaction in the patient.
6.Dosage too high	The dosage is too high, resulting in undesirable effects experienced by the patient
7. Noncompliance	The patient is not able or willing to take the drug therapy as intended

Similar to other clinical problems, DRP is also clinical problems and it must be identified & resolved. The main responsibility of pharmaceutical care practitioner is an identification of DRP, but DRP can't be solved or prevented unless the cause of the problem is clearly understood. So, to construct a good pharmaceutical care it is necessary to identify and to categorize not only the DRPs but also the most likely causes and possible interventions (9).

Drug related problems are harmful clinical events directly related to the use of medicines and may include under or over treatment, inappropriate dosing and choice of formulation, poor adherence, inappropriate drug combination which leads to drug interaction and harm caused by adverse drug reaction(ADR). Due to this reason the burden of DRP on population health is humongous (10, 11).

Drug related problems comprise both non-preventable ADR and errors in medication therapy that differ in their actual or potential risks to cause patient harm(12). DRPs are directly associated with harmful or negative health outcomes, such as the worsening of symptoms or prolonged hospital stay (13). The prevalence of ADR and medication errors in the mental disorder setting is increased as compared to other medical conditions(14, 15) which substantially endanger the medication safety of mental disorder patients. An increased awareness regarding the safety of drug therapy emerged in the psychiatric setting with task force on patient safety published by the American psychiatric association (APA) (16).

1.2. Statement of the problem

In spite of medications have vital roles to prevent and control or treat different diseases, inappropriate use of medications may be insecure and lead to problems related to medications(17). DRPs are of a major concern in health care due to the negative impact like, increased cost, increased risk of death, reasons for admission and prolonged hospital stay. DRPs are associated with significant public health problem worldwide and have been significantly increased over the past few decades. The estimated hospital admission due to DRPs was 5- 10 %, in which half (50%) of them are preventable or avoidable (18). In USA, DRP represents one of the top ten leading causes of death and ADRs are responsible for 3-5% of hospitalizations which is around one million per year hospitalizations, with estimated cost of 130 billion dollars (19). In developing and transitional countries, less than 40% of patients in the public sector and 30% of patients in the private sector are treated in accordance with standard treatment guidelines(20).

Several studies have documented the type and extent of DRPs in developed countries. However, there is a dearth of published information on the type and extent of DRPs in developing countries (11). Hence it is very crucial to conduct studies on DRPs in developing countries like Ethiopia where there is resource scarcity, weak health care system and shortages of trained health care workers.

Drug related problems are prevalent and cause considerable patient mortality and morbidity, as well as increasing health care cost. The association of psychotropic medications with ADR is common and can occur even at the normal doses used in the management of acute and maintenance phases of psychiatric disorders (21, 22).

To improve the therapeutic benefit and health related quality of life, identifying and resolving DRP is an important priority for health professionals. So, as many studies shown that clinical pharmacy can effectively identify, solve and prevent clinically significant DRPs (23). In Ethiopia, mental disorder is the leading non-communicable disorder in terms of burden, there is limited attention for those patients at government and hospital level. Studies on the prevalence and characterizations of DRPs among psychiatric patients are virtually lacking in Ethiopia and in Jimma in particular. The aim of this study is to identify drug related problems and associated factors in admitted psychiatric patients in Jimma University Medical Center (JUMC).

1.3. Significance of the study

Pharmacotherapy can treat diseases and improve the well-being of chronic illness like psychiatric illness. However, its benefits may be compromised due to DRPs. Therefore, it is important to assess DRPs resulting in negative outcome and analyze whether improvement in the health care delivery practices can be made to reduce the likelihood of similar outcomes occurring in the future.

Unless handled appropriately drugs are harmful. This is important especially in psychiatric patients, because most psychiatric patients are at risk of cardiovascular disease and other chronic illness like diabetes mellitus from the disease by itself and drugs used for the treatment of psychiatric disease. Those patients are also at high risk of DRPs, since ADR, DDI, and poly-pharmacy were common in psychiatric patients which leads to non adherence finally poor prognosis or short life expectancy may happen if treatment optimization was not done early. So, identification of the cause and associated factors is important for further prevention as well as to intervene the already occurred drug related problems.

To date, DRPs among psychiatric patients have not been well investigated and documented at JUMC in particular and in Ethiopia as whole. So, conducting such kind of study is helpful in identification, quantification, documentation and resolving of those problems in psychiatric patients. In addition, the outcome of this study will serve as input information for future researchers and it will improve the awareness of health care professionals and policy makers about importance of pharmaceutical care practice in psychiatric patients. Hence, it will contribute to the formulation and implementation of pharmaceutical care services in the health care system policy of JUMC as well as in the country as a whole.

2. Literature review

2.1. Prevalence of drug related problems

A cross-sectional study in Denmark showed that, 349 DRPs were identified from 1291 prescriptions in psychiatric admitted patients. The proportion of patients found to have at least one DRP was 123/207(59%) and the proportion of patients with at least one DRP assessed to be potentially serious or fatal was 69/207(33%) and 24/207(12%),respectively. Drug interactions (36%) and dose too high (16%) were the frequent DRP identified(24).

According a study conducted in Sweden revealed that, of 103 patients 133 DRPs were identified by clinical pharmacist in 66% (68/103) of the study populations. Inappropriate drug use (29%) the most common followed by drug interaction (16%).Cardiovascular & psychotropic drugs are the most commonly used drugs involved in the DRPs: in case of cardiovascular drugs 28% (27/99) but psychotropic drugs are causing higher risk of DRPs which is 20 (71%) DRPs from 28 patients taking psychotropic drugs (25).

Another prospective observational study in United Arab Emirates (UAE) revealed that, of 714 patient attending psychiatric outpatients, 73(10.2%) patients experienced at least one ADR and a total of 112 ADRs were observed during the study period. The majority of the patients who experienced ADR were taking one to two drugs (54.8%) and experienced at least one ADR (26).

A historical multicenter cohort study was conducted in Japan (JADE), 955 ADE was seen out of 283 patients, the most common class of drugs associated with ADEs was atypical antipsychotics (34%,323/955) and almost all of the ADEs (46.9%,448/955) were associated with typical and atypical antipsychotics. Non-psychotropic drugs accounted for 16% (124/789) of non-preventable ADEs, but 42% of all ADEs were preventable (27).

A finding conducted in Turkey showed that, of 172 patients they were 417 drug interactions risks of which the most frequent interactions was the moderate risk of interactions(total number of 366:87.11%). Approximately one in four patients (42:24.2%) was taking drugs with major risk of drug interactions (28).

Clinical pharmacist intervention study conducted in Brazil among patient with depressive disorders showed that high acceptance rate by prescribers, 82% acceptance rate by physicians reported in the study a total of 60 interventions were made from 25 patients over 6 month study period. The most frequent drug related problems identified were, ineffective medication (21%), non-adherence (17%), dose too low (17%), needs additional drug (13%) and a significant dispensing error (2%) (29).

A prospective observational study conducted in India at a single psychiatric hospital among 120 patients was screened for 4 months found that, out of 33 patients, among 19 patients had observed 26 adverse drug reactions (ADRs) and 14 had observed 24 potential DDI. The overall incidence of DRPs was 15.83% and the common ADRs observed were hyponatermia and headache (30).

A long term observational study in India showed that, a total of 100 patients were investigated during five months follow up in outpatient, of whom 91(91%) were suspected to suffer from ADR(31). Similarly, an observational study conducted in India, a total of 9701 patients were included in the study revealed that the incidence of ADR was 0.69 %(32).

Prospective observational study was conducted in the psychiatric outpatient in New Delhi for three month revealed that, of the total 224 patients, ADRs were observed in 28 patients with a total of 38 ADRs (16.96% incidence) and the highest number of adverse effects was noted with risperidone ten followed by olanzapine eight and ariprazole three (26).

A prospective observational study was conducted in India showed that among 205 patients 463 drug interactions were detected of which 70 were major severity. Antipsychotic were involved in 42% of the total interactions and among these haloperidol (21.5%),olanzapine(10.3%) were involved in higher percentage of drug interactions but aripiprazole (3.48%) have less drug interaction as compared with others(33).

A study conducted in India which is longitudinal observational study among patients attending outpatient psychiatry showed that, of 778 patients the incidence of ADRs was 5.2% and among the common ADRs were Extra Pyramidal side effect (EPS) (18), anti-cholinergic side effect (10) with risperidone associated ADRs accounts almost half the ADRs (22/45) (34).

According a longitudinal observational study that was conducted in the psychiatric out patient in India reveled that, a total of 2000 patients were screened for the ADR of whom 429 (21.45%) were suspected of having at least one ADR (35).

A finding from study done in Pakistan, that enrolled 177 patients' records with psychiatric illness revealed that ,as per Modified Hartwing and Seiagel scale for assessing the severity of ADRs 83% ADRs were mild in severity and only 17% ADRs were moderate in severity with no reported ADR belonged to the severe or lethal category. The common ADRs were increased weight, increased appetite, sedations and akathesia (36). In addition, a prospective study done in India, revealed that the incidence of potential DDI was 55.2% and 5.5 %(143) of the pDDI led to 122 ADR(37). Likewise, another retrospective and cross-sectional study done in Mexico for one year period, showed that out of 126 schizophrenia patients, the incidence of potential drug-drug interactions was 68.25%(86) and majority of them(83.2%) were moderate level of drug – drug interactions(38).

According to prospective study conducted Pakistan among hospitalized patients in psychiatry, 61% of the patients developed ADR to single drug and 39% to multi drugs and based on causality assessment, as per Naranjo et al. algorism all were judged as probable. All reactions except one were of type A and EPS effects were the most common and Olanzapine was the top drug by causing ADR in this study (39).

A prospective cross-sectional study among major depressive patients in Gondar University that enrolled 270 patients, about 186 (85.7%) of patients encountered ADR. The most common ADR was weight gain (29; 15.59%) followed by loss of appetite (27; 14.52%) and sedative was rarely ADR (1.11%). Based on Naranjo et al., scale about 198(92.24%) ADRs were probable and 19(8.8%) were possible (40).

2.2. Predictors of drug related problems

In a prospective 'before and after' study performed in a long –stay hospital in Montenegro no statistical association were observed between gender(p=0.96), age(p=0.10), duration of treatment(p=0.15), length of hospital stay(p=0.60),residency(p=.062), and number of prescribed drug per patient (p=0.4) with developing DRps (41).Another study in Denmark shows the independent risk factors for the occurrence of DRPs were number of prescriptions per patient and number of medical diagnosis(24).

A prospective observational study conducted in India at a single psychiatric hospital among 120 patients showed that, the incidence of DRPs are significantly associated with patient age, gender and the number of drugs prescribed (30).

A retrospective cross-sectional study performed in patients admitted to psychiatric ward in Pakistan independent factors which predicted the occurrence of DDI in the study population were length of hospital stay and number of medication per patient. Patients who took ≥7 drugs/day on average were 3.4 times more likely to have DDI than patients who took <7 drugs/day on average(42).

Cross-sectional study conducted in Ethiopian referral hospitals showed that, participants whose age group of 15-64 (AOR=0.03,95%:0.01,0.16),patients(CI: 0.03,0.47)and khat chewers(95%:0.09,0.68) were significantly less adherent were as patients having less side effects have good adherence to antipsychotic medications(43).

Cross-sectional study conducted in Jimma University indicates that, the determinants of non-adherence among psychiatric patients attending outpatients were irregular follow up, lack of family support/social support and a complex regimen. The odds of non-adherence among patients who lacked regular follow up were two times more than those of who don't [AOR-2.0, 95% CI(1.21,3.29)]. Poor family /social support was associated with increasing risk of non-adherence [AOR-2.1,95% CI(1.03-4.18)] and patients with complex regimens prescribed were more likely to be [AOR-2.1, 95% CI(1.19-3.63)] non adherent to their medication than those without complex drug regimen(40)

2.3. Pharmacist intervention

Clinical pharmacist intervention study conducted in Montenegro entitled with pharmaceutical care in long stay psychiatric hospital showed that, clinical pharmacist proposed 182 interventions from those interventions discontinuations of medications was the most commonly(58%) proposed with a comprehensive explanation and tapering was provided, the physician acceptance was 70%(127) but 91 intervention was only accepted and implemented. Due to the recommendations by physician (e.g., Clozapine dosage can't be increased due to adverse effect or second generation antipsychotic due to the occurrence of diabetes mellitus) , 36 interventions were accepted but not implemented. The outcome of interventions were not known for seven DRPs, 25 were completely solved, 13 partially solved and 25 there was no possibility to solve the problem (44).

Clinical pharmacist intervention study conducted in Germany in hospitalized psychiatric patient showed very high acceptance rate by ward staff (88.6% of all recommendations). 815 DRPs were detected and the problem categories 77 were complex therapy regimen, inadequate monitoring of drugs (60) and inadequate dosing frequency (67). 346 interventions were implemented, 16% were classified as ineffective drug therapy and cost reduction was implemented only in 2 % (45).

2.4. Conceptual frame work

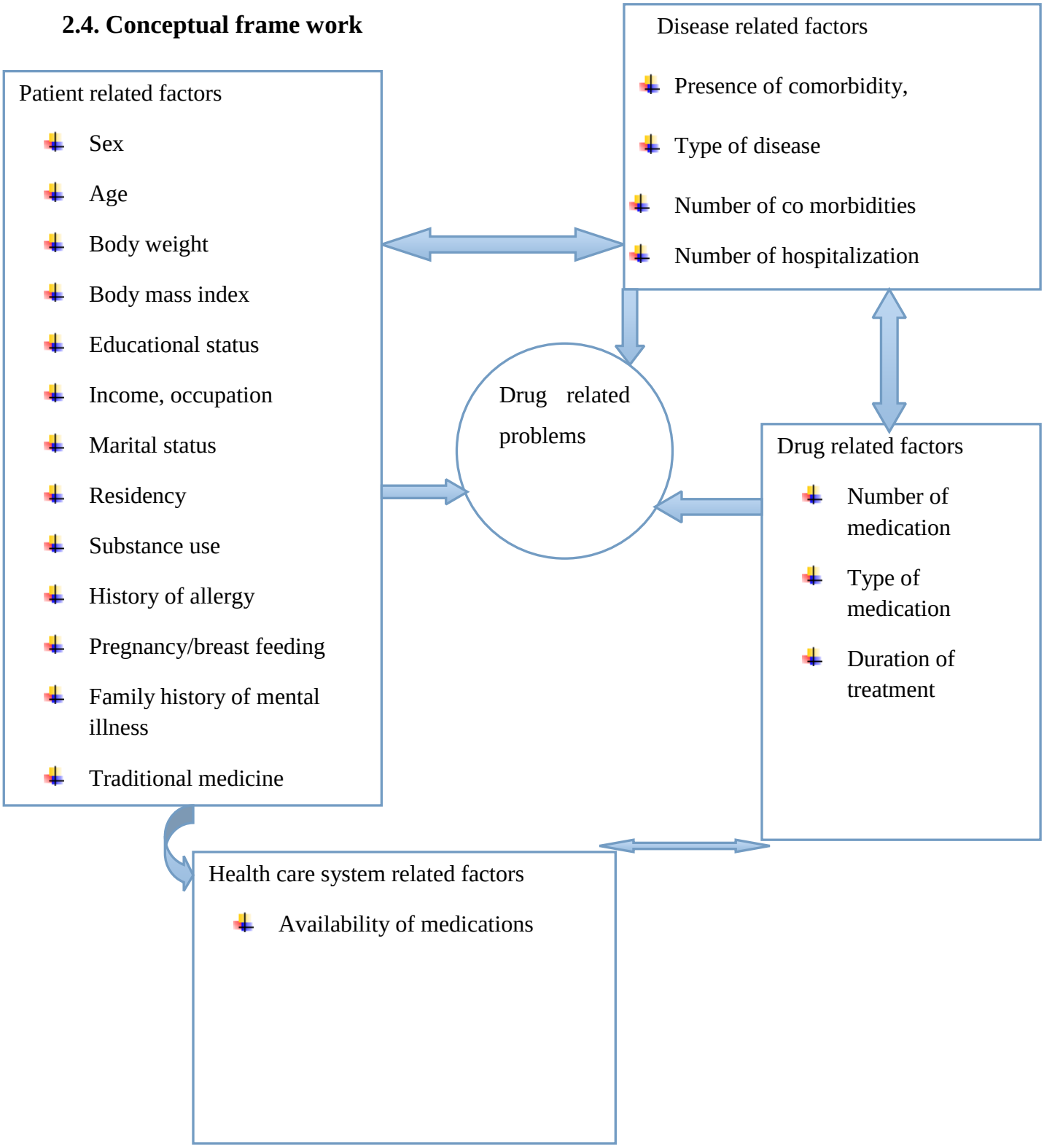


Figure 1: Conceptual frame work showing the relationship between drug related problems and associated factors, source: Developed by reviewing different literatures

3. Objective

3.1. General objective

This study was aimed to assess drug related problems and associated factors among psychiatric patients admitted to JUMC from March 01 to August 30, 2018.

3.2. Specific objectives

To assess the prevalence of drug related problems among psychiatric patients admitted to JUMC

To identify factors associated with drug related problems among psychiatric patients admitted to JUMC.

To assess type of drug related problems among psychiatric patients admitted to JUMC.

4. Methods and Participants

4.1. Study Area and Period

The study was conducted at JUMC, which is located in Jimma town; Jimma zone, Oromia region, Southwest Ethiopia. Jimma University is among the largest teaching institution in Ethiopia. JUMC is the only teaching and referral hospital in the south western part of the country located in Jimma town, southwest Ethiopia, 346 km far from Addis Ababa. It provide services for approximately 9,000 inpatient, 80,000 outpatient attendants, 11,000 emergency cases and 4500 deliveries in a year coming to the hospital from the catchment population of about 15 million people. The hospital has a total of around 600 beds and a total of 21 units. Psychiatric ward is one of the inpatient services provided by JUMC in the isolated area (46).The study was conducted from March 01 to August 30,2018 in the psychiatric ward of JUMC and the annual admission in the last year in psychiatric ward was 356 pateints.

4.2. Study design

Hospital based prospective observational study was conducted among psychiatric patients admitted to psychiatric ward of JUMC from 01 March to August30, 2018, who fulfills the inclusion criteria.

4.3. Population

4.3.1 Source Population

All patients with psychiatric disease who admitted to JUMC were the source population of the study.

4.3.2. Study population

All adult patients with psychiatric disease who were admitted to psychiatric ward during the study period who fulfills the inclusion criteria were the study population of the study.

4.4. Inclusion and Exclusion Criteria

4.4.1. Inclusion Criteria

All adult (age ≥18 years old) psychiatric patients admitted to psychiatric ward and those who stayed for more than 24 hours in the ward.

4.4.2. Exclusion Criteria

Psychiatric patients re-admitted during the study period and those not volunteer to participate in the study.

4.5. Sample size and sampling technique

The minimum sample size required is calculated using single population proportion sample size estimating formula. For population >10,000

$$n = \frac{(Z_{1-\alpha/2})^2 P(1-P)}{d^2}$$

Since the total population is < 10,000(178) the final sample size can be given as:

$$n_f = \frac{N (Z_{1-\alpha/2})^2 P(1-P)}{d^2(N-1) + (Z_{1-\alpha/2})^2 P(1-P)}$$

Where:

- n is minimum sample size
- N= source population size = 178
- P is estimate of the prevalence rate of drug related problems among admitted psychiatric patients ,since the prevalence is unknown P is taken as 50% (p=0.5)
- d is the margin of sampling error tolerated which is 0.05
- $Z_{1-\alpha/2}$ is the standard normal variable at (1-α)% confidence level and α is 5%
- $Z_{1-\alpha/2}$ at 95% confidence level = 1.96

Therefore, substituting all in the above formula nf =122

Taking 10% of total sample size as non response rate in to consideration the minimum sample size required for the study was 135. All patients who can fulfill the inclusion criteria were included in the study consecutively (consecutive sampling) until the required sample size is achieved.

4.6. Study variables

4.6.1. Dependent variable

Drug related problems

4.6.2. Independent variables

Patient related factors	**Disease related pattern**
Age	Presence of co morbidities
Gender	Number of co morbidities
Body weight	
Income	**Drug related factors**
Religion	Number of medications
BMI	Type of medication, duration of treatment
Educational level	**Health care system related**
Marital status	Availability of drug
Occupation	
Residency	
Smoking	
Khat chewing	
Traditional medicine use	
Alcohol drinking	
Pregnancy	
Breast feeding	
History of Allergy	
Living status	

4.7. Data collection instrument and procedures

A structured data collection tool which includes questionnaire and data abstraction format was developed and used to extract all necessary information. The structured questionnaire was translated to local languages, Amharic and Afan Oromo, and it was tested for applicability. Primary data such as socio-demographic characteristics was collected by interviewing patients or their care giver using the structured questionnaire. DRP was assessed according to Cipolle et al(9). This classification system is widely accepted patient centered text book, which is standardized guideline for pharmacists while practicing pharmaceutical care service and authorized by Ethiopian Hospital Reform implementation Guidelines (EHRIG) and Pharmaceuticals Fund and Supply Agency (PFSA) to be implemented the provision of pharmaceutical care service in Ethiopia hospitals(47, 48).

Adverse drug reaction was assessed according to Naranjo et al.ADR probability scale which is standardized as well as validated instrument for ADRs assessment. Micromedex, mediscape drug interaction checker and other convenient instruments were used to check drug interactions (drug-drug, drug-food and drug –disease). Data for this study were collected by two pharmacists and two psychiatric nurses. The principal investigator, and one second year postgraduate clinical pharmacy was involved in deciding interventions. DRPs were identified using standard guidelines for respective disease identified and guidelines for psychiatric disease, American Psychiatric Association guidelines, mood stabilizer guidelines-2015, NICE bipolar treatment guideline-2014, antipsychotic use guidline-2013 and others. Secondary clinical data were collected through medical chart review of patients using a prepared standard checklist and by communicating with treating physicians' [Annex III]. Patients' medical charts were reviewed on a daily basis following the patient / family interview. The data that were collected from patients' charts included: medical conditions, mental condition, substance use condition, prescribed medications with their indication, safety profile, and drug duplication, dosage regimen, past medication and medical history, and pertinent laboratory findings.

4.8. Data Quality management

Data collectors were trained for two days and orientation was also given by the principal investigator. The questionnaire was translated in to the local languages, Amharic and Afan Oromo for consistency of data collection. Pretest was performed on 7 (5% of the sample) participants at psychiatric ward of JUMC before the actual data collection to assess the validity of the data collection tool and based on the finding modification of the data collection tool were done.

On a daily basis the principal investigator was also closely supervise the activity of data collector. On each data collection day, all collected data were reviewed by the principal investigator for completeness, accuracy, and clarity. Data coding, cleaning and verification were done before entry into Statistical Package for Social Science (SPSS).

4.9. Data Processing, Analysis and Presentation

Data were coded, checked for completeness and consistence. The collected data were entered into a computer using EpiData manager version 4.2.0.0 software and analyzed using SPSS version 21. Descriptive statistics including mean and standard deviation for continuous variables and frequency and percentage for categorical data were used to summarize socio-demographic and clinical characteristics of the study participants.

Multi-collinearity among variables was checked by using linear regression (variance inflation factor (VIF) between the variables (all of the variables have below 5 VIf). All of the variables were not strongly correlated, indicating that the assumption of multi-collinearity was no longer violated. Cell adequacy test among categorical variables were checked by using descriptive statistics crosstab and variables with above 20% expected count less than five were excluded from analysis (e.g. body mass index, metabolic syndrome, traditional medicine use, past medical history and family history of mental illness). Interaction between variables were also checked using Cochran's and Mantel-Haenszel statistics and indicating that there were no interaction between variables. After checking the absence of collinearity among variables, variables in bivariate analysis with *p*-value less than 0.25 were further analyzed in multivariate logistic regression to control the effect of confounders(49, 50).

Bivariate and multivariate logistic regression analysis was performed to investigate associations and factors associated with the occurrence of DRPs, respectively. Statistical significance was considered at p value of ≤0.05. The final results for the factors associated with DRPs were presented using Odds Ratios (ORs) with its 95% confidence intervals (CIs) in correspondences to the p value of the multivariate logistic regression analysis set by ≤0.05.

4.10. Ethical Consideration

Ethical clearance and approval of the study were obtained from Jimma University ethical approval review board, institute of health as well as subsequent permission was obtained from JUMC to access data and interview patients. Participation of patients in the study was entirely voluntary, confidential and private information like name and address were restricted from any disclosure. The right of participants to withdraw from the interview or not to participate was respected. Patient privacy was kept while interviewing by using patient's guard.

4.11. Dissemination plan

The finding of the study will be submitted to the Jimma University, institute of health and school of Pharmacy. The finding will be presented during thesis defense, as a partial fulfillment of Master degree in clinical pharmacy. Finally attempts will be made to present the finding on scientific conferences and to publish it in peer reputable journal.

4.12. Definitions of terms and Operational definition

Duration treatment: The total duration of time starting from the treatment was started until intervened of the patient was done

Poly-pharmacy: is considered when greater than or equal to two psychotropic drugs are prescribed for the patient

Rural residency: Participants who resided in less-populated or non-urban areas.

Psychiatric co-morbidity: is a disease condition when a patient has at least one additional disease other than a single psychiatric disease (participant who had more one mental disorder).

Medical co-morbidity: is a disease condition when a patient has at least one medical disease other than psychiatric disease.

Drug related problem: is any undesirable event experienced by a patient which involves, or is suspected to involve, drug therapy, and that interferes with achieving the desired goals of therapy (6).

Adverse drug reaction: Any response to a drug which is noxious and unintended, and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease, or for the modification of physiological function (51).

Adverse Drug Event (ADE): Any untoward occurrences that may present during treatment with a pharmaceutical product but that do not necessarily have a causal relation to the treatment (51).

Pharmacist intervention: any action by a clinical pharmacist that directly results in a change in Patient management or therapy.

No formal education- a person not certified with any grade level of education.

Unemployed: participants who had no their own known income.

Hospitalization: Patients who stay for more than 24 hours in the hospital.

Number of hospitalization: The number of hospitalization in the previous one year excluding the current hospitalization.

Alcohol use: drinks any alcoholic beverage regularly for more than 1 and 2 units (1unit = 300ml of 4-5% of alcoholic concentration) of drink per day for female and male, respectively(52).

Current smoker: An adult who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes.

Ex-smoker: An adult who has smoked at least 100 cigarettes in his or her lifetime but who had quit smoking at the time of interview.

5. Result

Flow chart of participants involved for analysis

During the six months' study period, the psychiatric ward served for about 147 in-patients who diagnosed with psychiatric disease. One hundred thirty five of them were included in the study but 12 participants were, excluded because from five (5) participants were re-admitted and three (3) participants were below 18 years old.

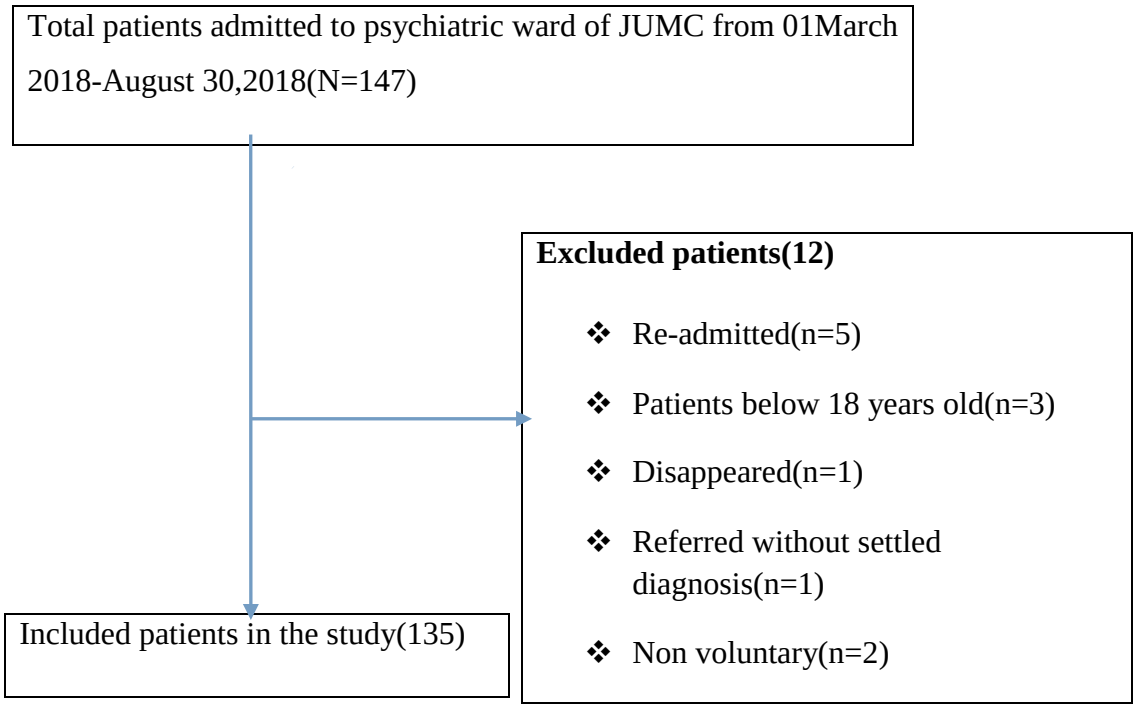


Figure 2: Flow chart of participants' sample size involved in the analysis

5.1. Socio-demographic characteristics

In this study, a total of 135 study participants were included. About two third, 92(68.1%) of the participants were males. The mean (±SD) age of the study participants was 31.95±10.40 and about one third, 45(33.3%) of them were in the 4th decade of age (31-40 years). Most, 84(62.2%) of the participants were single and more than half, 76(56.3%) of the participants were resided in urban area. Only about one-tenth 14(10.4%) of the participant had no formal education and most 103(76.3%) of the participants were unemployed. Only 7(5.2%) and 40(29.6%) of the participants were ex-smokers and alcohol user, respectively (Table 2).

Table 2: Socio-demographic characteristics of patients with psychiatric disease admitted to psychiatric ward of JUMC, Jimma, Ethiopia, March 01– August30, 2018.

Variables	Categories	Study participants(N=135)	
		Frequency	Percentage (%)
Age(year)	18-20 21-30 30-40 41 above	18 52 45 20	13.3 38.5 33.3 14.8
Sex	Male Female	92 43	68.1 31.9
Marital status	Single Married Divorced Widowed	84 32 15 4	62.2 23.7 11.1 3.0
Place of residence	Urban Rural	76 59	56.3 43.7
Educational status	No formal education Primary education Secondary education Tertiary education	14 39 48 34	10.4 28.9 35.8 25.2
Religious	Muslim Orthodox Other*	74 26 10	54.8 19.3 7.4
Employment status	Unemployed Employed	103 32	76.3 23.7
Alcohol consumption	No Yes	95 40	70.4 29.6

Smoking status	Never smoker Current smoker Ex- smoker	109 19 7	80.7 14.4 5.2

Other* - Catholic and seventh day church followers. SD: Standard deviation.

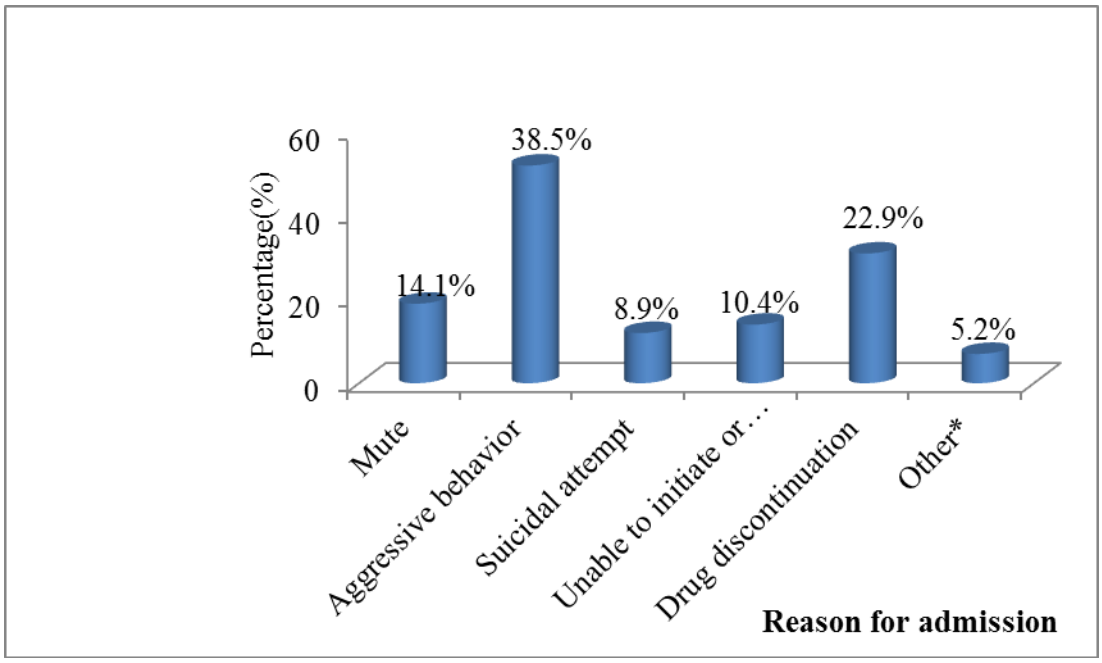
5.2. Clinical characteristics

The mean (±SD) duration of treatment was 29.2±51.6 months (1.22±2.1 years). More than half (64.4%) of the study participants had no previous admission in the last one year. Most of the participants (66%) were hospitalized due to drug discontinuation. The reasons for discontinuation were an affordable price, unavailability of the medication and perception of good remission. Of the total study participants 35(25.9%) had psychiatric comorbid conditions with a mean (±SD) of 0.25±0.42 comorbidities per patient. The most common psychiatric comorbid disease was substance use disorder, 20(58.8%). Majority, 121(89.6%) of the study participants were without family history of mental illness. The clinical characteristics of patients with psychiatric disease are described below (Table 3).

Table 3: Clinical characteristics of psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

Variables	Categories	Study participants(N=135)	
		Frequency	Percentage (%)
Number of drugs used per patient	1-2	91	67.4
	3-4	39	28.9
Duration of hospital stay (in days)	5 and above	5	3.7
	≤30days	85	63.0
Duration of treatment(in years)	>30 days	50	37.0
	<1 year	85	63
Number of previous hospitalizations	1-3years	15	11.1
	Above 3 years	35	25.9
Presence of psychiatric comorbidity	0	87	64.4
	≥1	48	35.6
	No	101	74.8
	Yes	34	25.2

5.2.1. Reason for admission of psychiatric patients to psychiatric ward

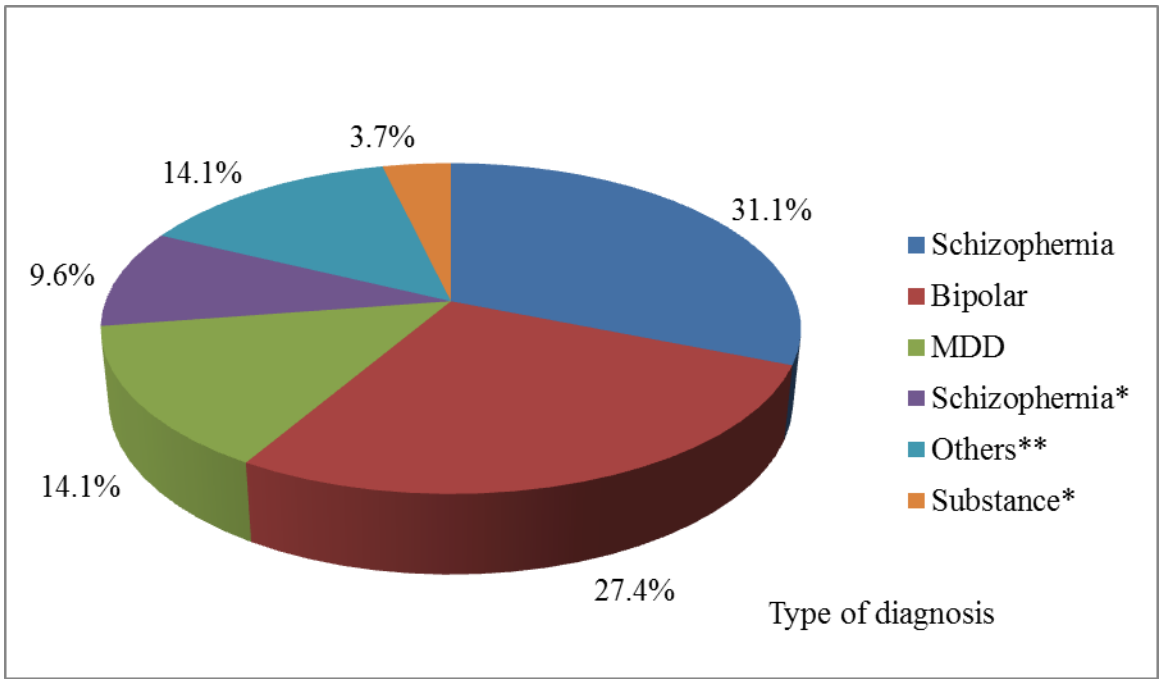


Other*: Unexplained fear, stressed, forgetfulness, anxious

Figure 3: Reason for admission of psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

Fifty two(38.5%) of the study participants were admitted with a chief compliant of aggressive behavior both physically and verbally followed by, drug discontinuation with worsening of the symptoms,31(23%) and only,12(8.9%) had admitted with suicidal attempt as shown in the above **(**Fig- 3**)**.

5.2.2. Pattern of psychiatric disease admitted to psychiatric ward at JUMC



Other**: Catatonia, somatic syndrome, Posttraumatic stress disorder, Anxious, MDD: Major depressive disorder, Schizophrenia*:Schizophrenia with substance related disorder, Substance*: substance related disorder

Figure 4: Pattern of admission psychiatric patients to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

About one fourth, 37(22.4%) of the study participants were admitted with a diagnosis of bipolar related disorder and only 3.7% of them had admitted with substance use related disorder alone respectively as described above(fig 4).

5.3. Pattern of prescribed medications in psychiatric patients admitted to psychiatric ward

In the current study, the participants had on a mean (±SD) of 2.25±1.05 current medications in use. Haloperidol and risperidone were the most commonly prescribed drug from the first and second generation antipsychotics 31(68.9%) and 66(93%) respectively. Patients with psychiatric disease who were on second generation antipsychotics (SGA) plus mood stabilizer 35(25.9%), followed by SGA alone 26(19.3%) and first generation antipsychotics (FGA) plus mood stabilizer 17(12.6%).

Table 4: Pattern of prescribed medications in psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

Therapeutic class	Total number of medications(N=304)	
	Frequency	Percentage (%)
Mood stabilizer	44	14.5
FGA	45	14.8
Haloperidol	31	68.9
Chlorpromazine	12	26.7
Thiordazine	02	4.4
SGA	71	23.3
Risperidone	66	93
Olanzapine	04	5.6
Clozapine	01	1.4
Antidepressant	20	6.6
Benzodiazepines	86	28.3
Other*	38	12.5

Other*: Anticholinergic, anti-infective, beta-blocker, FGA: First Generation Antipsychotic

SGA: Second Generation Antipsychotics

5.4. The identified DRPs and possible causes

A total of 161 DRPs were identified with a mean (±SD) of 1.6±0.60 DRPs per patient. One or more DRP were identified in 100(74.1%) of the study participants. The most commonly encountered type of DRP was needs additional drug therapy, followed by ineffective drug therapy and adverse drug reactions (Table 5).

Table 5: Drug related problems and causes among psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

Type of Drug related problems		Study participants with DRP(N=100)	
	Causes	Frequency	Percentage (%)
Ineffective drug therapy	Not effective for the condition	25	15.5
	Conditions refractory to drug	10	6.2
Adverse drug reactions	Unsafe drug for the patient	5	3.1
	Undesirable drug effect	21	13
	Other	4	2.5
Dose too low	Wrong dose(sub therapeutic)	7	4.3
	Drug interaction	7	4.3
	Frequency inappropriate	2	1.2
Unnecessary drug therapy	Duplication of therapy	8	5
	No medical condition at that time	16	9.9
Need additional drug therapy	Untreated medical/psychiatric condition	44	27.3
	Preventive/prophylactic drug therapy	7	4.3
Dose too high	Frequency inappropriate(over-therapeutic)	6	3.7

Total number of participant with at least one DRP	100	74.1
Total number of identified DRPs		161
Average number of DRPs per patient		1.60±0.60

5.4.1. Number of DRPs among the study participants

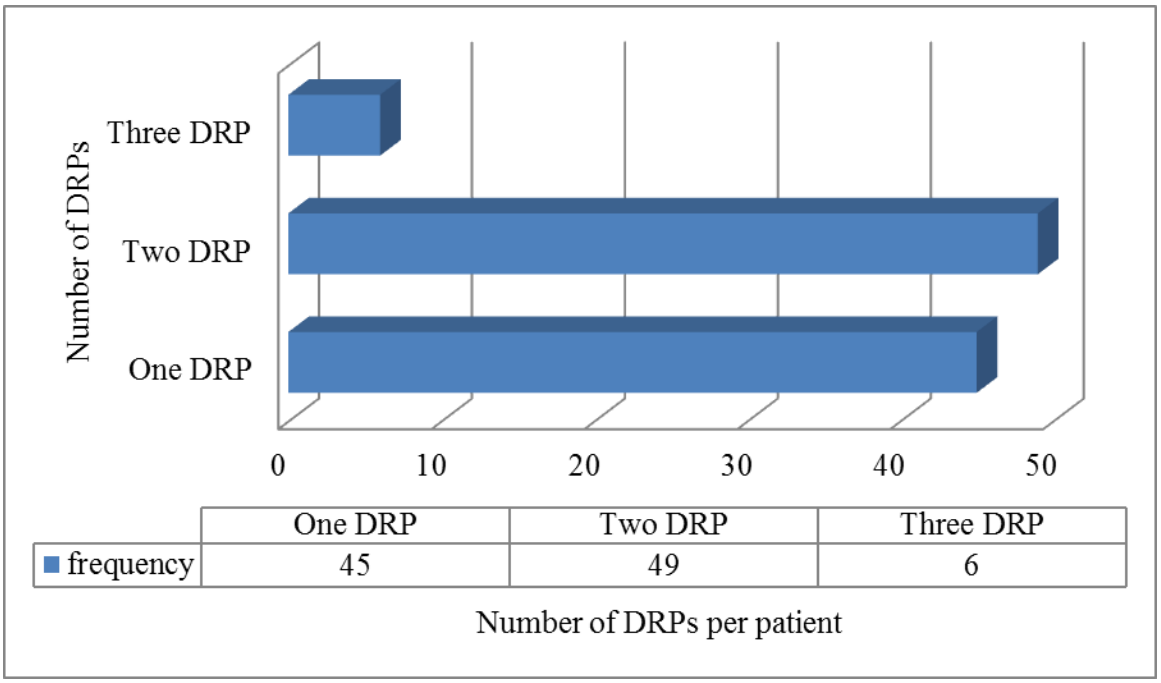
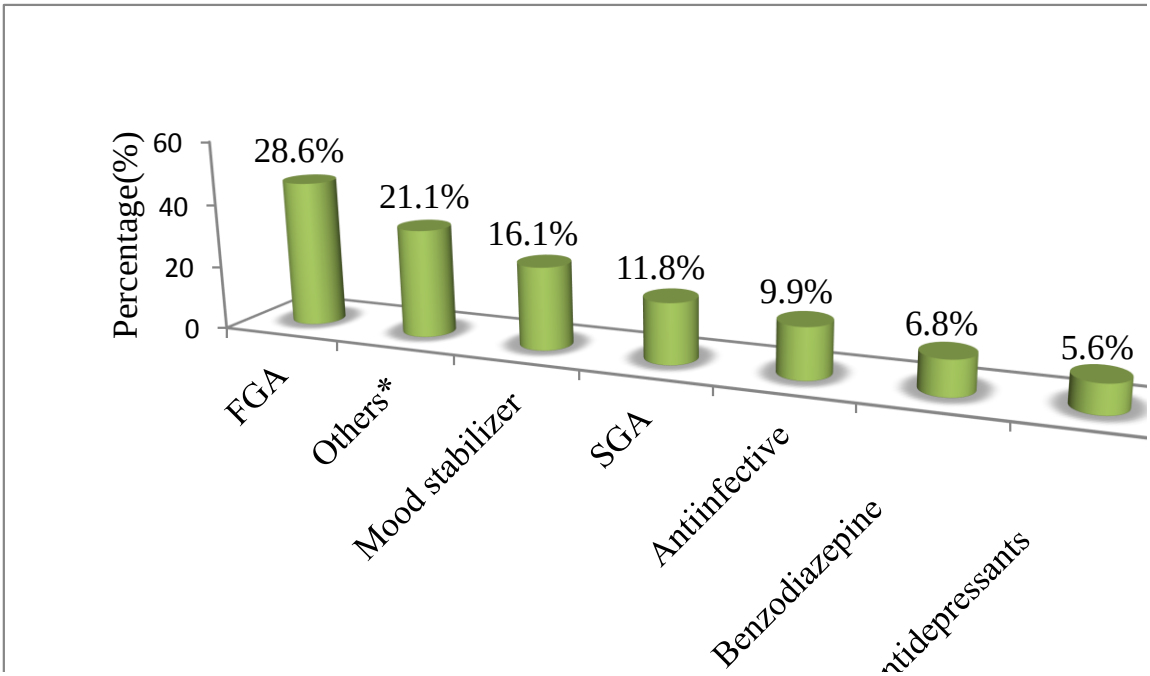


Figure 5: Number of drug related problems among psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018

DRP: Drug related problems

Majority of the study participants had one or two DRPs, 94% and only 6% of them had more than two DRPs per patient were identified as described in the above(fig 5).

5.4.2. Medications involved in experiencing DRPs



FGA:First generation Antipsychotics,SGA:Second Generation Antipsychotics,Others*:Beta-blokers,thioamides,Iron preparetions,Topical cream, Eye drops,Antihypertensive

Figure 6: Medications involved in the occurrence of drug related problems among psychiatric patients admitted to psychiatric ward at JUMC, Jimma, Ethiopia, March01-August30, 2018.

The most commonly involved medications in experiencing DRPs were first generation antipsychotics, followed by mood stabilizer and SGA. In addition benzodiazepines and other non-psychotropic medication were also attributed in experiencing DRPs. ADR category of DRP was mainly encountered in those patients who were on FGA based regimen. Participants who were on antidepressant were also susceptible for ineffective drug therapy and mood stabilizer for drug interactions respectively as shown above.

5.4.3. Identified DRPs in admitted psychiatric patients

Adverse drug reaction category of DRP was the third commonly observed in admitted psychiatric patients. Twenty six were experiencing ADR in patients taking first generation antipsychotics and other psychotropic drugs within therapeutic dose, in high dose of those drugs and due to rapid titration of the antipsychotics. The ADR was common in second and third decade of age groups.

In the case of ineffective drug therapy, the choice of drug product was inconsistent with the evidence based guideline recommendations. For example; fourteen (14) cases were taking carbamazepine without any contraindication or intolerance of sodium valproate.

In patients with psychiatric disease other than psychotropic drugs were also assessed for DRPs. Those drugs mainly included treating hyperthyroidism (like, thioamide, beta-blocker) and infectious disease (like, cellulitis).

5.4.4. Factors associated with the occurrence of DRP

According to the multivariate logistic regression analysis (Table 6), four variables were significantly associated with the occurrence of DRPs. From the adjusted odds ratio (AOR) for the past medication history (AOR=4.414, 95%CI: 1.069-18.22, P=0.040) which indicates that patients who had previous history of medication were 4.4 times more likely than to develop DRPs. Meanwhile, poly-pharmacy (AOR=8.845, 95%CI: 1.46-23.00, P=0.018) indicated that participants with poly-pharmacy were 9 times more likely than participant without pharmacy for the occurrence of DRPs. In addition there were also associations related to duration of treatment (AOR=18.18, 95% CI: 2.0-16.3, P=0.010) indicated that patients on long duration of treatment were more likely than participants with short duration of treatment in experiencing DRPs.

However, age (p=0.177), number of medication per patient (p=0.38), presence of psychiatric comorbid conditions (p=0.10), length of hospital stay (p=0.154), number of hospitalization and sex (p=0.628) had no statically significant association with the occurrence of DRPs. In addition, traditional medicine use, family history of mental illness, pregnancy status, breast feeding and body mass index were not included in this analysis because of fewer respondents which subjected in shifting to one side.

Table 6: Bivariate and multivariate analysis of factors associated with Drug related problems among admitted psychiatric patients at JUMC, Jimma, Ethiopia, March01-August30, 2018.

Covariates	**Categories**	**Drug related Problem**		**Odds Ratio(95% CI)**			**P-value**
		Yes(n=100)	**No(n=35)**	**COR**	**P-value**	**AOR**	
Sex	Male	67	25	1			
	Female	33	10	1.23(0.530-2.86)	**0.009**	0.740(0.28-2.48)	0.628
Place of residence	Urban	60	16	1	0.21		**0.041**
	Rural	40	19	0.56(0.258,1.22)		0.32(0.100,0.98)	
Psychiatric comorbidity	Yes	31	4	3.48(1.13,10.72)	**0.015**	3.98(0.76,20.76)	0.100
	No	69	31	1			
Duration of treatment(year)	<1 year	56	29	1			
	1-3 years	12	3	2.07(0.54,7.9)	0.288	9.3(0.95,22.3)	0.056
	Above 3 years	32	3	5.5(1.56,19.6)	**0.008**	18.2(2.0,62.0)	**0.010**
Poly-pharmacy	No	70	31	1			
	Yes	30	4	3.3(1.07,10.24)	**0.037**	8.84(1.46,23.5)	**0.018**
Cigarette smoking	Never smoked	76	30	1			
	Ex-smoker	5	2	0.98(0.181,5.4)	0.9	0.49(0.039,6.18)	0.58
	Current smoker	19	3	2.5(0.69,9.07)	0.12	6.8(1.11,42.4)	**0.038**
Length of hospital stay(days)	0-30 days	58	26	1			
	31 and above days	42	9	2.09(0.88,4.9)	0.11	2.2(0.74-6.6)	0.154
Number of hospitalization	0	63	24	1			
	1-2	25	9	0.438(0.091,2.42)	0.83	0.4(0.09,1.7)	0.23
	3 and above	12	2	0.46(0.086,2.48)	0.14	1.4(0.087,21.8)	0.82
Number of medication per patient	0-2	86	33	1			
	3 and above	14	2	2.6(0.58,12.5)	**0.004**	2.9(0.28,32.2)	0.383

Age (years)	18-20		4	1			
	21-30	14	14	0.62(0.12,3.2)	0..56	0.33(0.066,1.65	0.177
	31-40	38	14	0.47(0.12,1.9)	0.29	0.3(0.061,1.66)	0.176
	41and	31	3	0.39(0.1,1.6)	0.20	0.7(0.088,5.70)	0.75
	above	17					

AOR: Adjusted odds ratio, COR: Crude odds ratio

5. Discussion

The current study was aimed to identify drug related problems and associated factors among psychiatric patients admitted to JUMC. Cipolle's et al.(9) DRPs classification system was used. DRPs were identified based on National Institute for Health and Care Excellence (NICE) Bipolar guideline, British psychiatric disorder (BAP) guidline-2015, and Antipsychotic medication switches guidelines recommendation. Findings of this study revealed that three-fourth (74.1%) of the study participants had at least one DRP per patient. The average numbers of DRP per patients were 1.6 and this was above the standard, because every should be patient without DRP was recommended. The main types of DRPs identified were related to initiation of additional drug therapy, ineffective drug therapy, ADR and unnecessary drug therapy. These problems were mainly caused due to need of additional drug therapy, inappropriate drug selection and use of over-therapeutic (frequency inappropriate) dose used for treatment purpose.

The prevalence of DRP(74.1%) in the current study is higher than from findings Denmark(41) and India(30) which was 15.8% and 59% respectively. Such discrepancies might be explained due to the dissimilarity in clinic setup, study design, professionals working in the area, and the difference in disease conditions of the participants; where by only patients with major depressive were enrolled in the later study but in our study all psychiatric patients were included comorbid condition and ADR might be high in patients with schizophrenia as they are predominant in this study this might be explain the difference and in former study (Denmark) patients were followed only for three days after admission but in our study for mean of 28 days were followed this might be contribute the difference.

In the current study, the result for ADR category of DRP was more prevalent compared to three studies previously conducted in India (25, 53, 54) which ranges 0.69%-17%. This variation could be due to the setting difference, sample size, duration of the study period and the availability of medications, which were in our setup the FGA (the typical) are common rather than the atypical once. In contrast, a finding of this study was considerably lower than that reported by two studies (55, 56) in India, in which more than 30% of the patients had ADR category of the identified DRPs. This discrepancy might be explained by variation in sample size, socio-demographic characteristics of the patients, setting (outpatient vs. inpatient) and the method of assessing for ADR. Thus, the later study the setting was both inpatient and outpatient, in addition the study

period was two years could be explained the variation. The result of this finding was similar with a study conducted in India (57). The maximum number of ADRs in this study were documented in the age group of 21-30(33.3%).

The study conducted in UAE(35) revealed that the incidence rate of the ADR was 10.2%, this was half of the current study which was 22.2%. This discrepancy may be due to the setting difference (outpatient vs. inpatient), the difference in the professions, the difference in method assessment of ADR, socio-demographic variation might be and there might be availability better option drugs with less adverse drug reaction.

Compared to multicenter study conducted in Japan (53) which revealed 63%, the current finding was also lower. This variation could be due to the difference in which the study was conducted in one psychiatry hospital and one teaching tertiary hospital, the duration of study period (one year) and the sample size recruited was also large.

Drug interaction was also common problem in this study. This finding was more prevalent than many of previous study reported from India (33).This variation might be due to availability of better option medications which had less likelihood of drug interaction. But in three of studies moderate drug interaction was the most common type of drug interaction which was also common in this study.

Moreover, there were also patients who needed initiation of additional medications other than psychotropic medications for prevention of ADRs in high risk patients for ADR and treating medical conditions. Majority of these problems also experienced in patients who required treatment for infectious disease like, community acquired pneumonia, urinary tract infection and other dermatological conditions (e.g. Tina Versicolor). In addition to infectious disease the second most common needed additional medications were to treat anemia, alcohol consumption induced vitamin deficiency conditions (moderate and severe only) and drugs needed in the treatment of catatonia. For example, 16 cases were with infectious disease were not prescribed medications to treat the infectious disease condition. Trihexyphenidyl (Artane) was the most commonly added drug to prevent and treat the adverse effect associated with antipsychotics drugs.

Dose too low was less common DRPs (9.9%) among the study participant in this study. This finding was lower than finding reported by Ilickovic IM,et al.(41)which is 13%. This variation might be explained due to the difference in the study participants: patients with above six month hospital stay, most of them were also above 60 years old, and the number of medication were (4.2±1.5) those conditions may lead to multiple medications with high DRPs might be. This data were closer with the study conducted in Germany (33), which reported that the less commonly encountered type of DRP in hospitalized patients with psychiatric disease was dose too low category of DRPs, accounted for 11.1%.This problem indicates that the patient was taken insufficient dose(sub-therapeutic dose) to produce the desired effect.. Hence, there was a need to titrate/step up the dosage regimen of the medication and appropriate selection of the drug regimen due to the reason that drug interaction was also cause for dose too low. In contrast, dose too low in the current study is more prevalent than finding from Denmark (41) shows 2.2% dose too low from the total DRPs. This discrepancy most likely due to difference in the study period, availability of medications, sample size or lack of institutional guideline and the difference in the method DRP assessment or comorbidity or professional experience working in the area or the disease pattern.

In this study the result for dosage too low was more prevalent compared to other two studies previously conducted(25, 42). This discrepancy might be due to variation in sample size or lack of institutional guideline. This might also be associated with the suggestions explained by prescribers in the clinic given that, some patients are non-adherent due to affordability, fear of adverse effect and different guideline recommend different equivalent dose of the antipsychotics. On the other hand, dose too low category of DRPs identified in the current study was more prevalent as compared finding from Denmark (24). This difference might be due to the difference in the socio-demographic of the participants, the profession working in the area, the difference in monitoring of the laboratory (organ function test) and the availability of the lesslikihood of interacting medications(in our set up patients with carbamazepine is common).

A similar manner was observed with the cause for DRPs. In this study, all of the identified problems associated with ineffective drug therapies were caused due to inappropriate drug selection which was failure to prescribe the first line drug therapy for psychiatric disease (e.g. bipolar, catatonia) as recommended by the guidelines.

In this study, the most reported ADRs were Extrapyramidal adverse reactions, like tardive dystonia, tardive dyskinesia and parkinsonian syndrome but neuroleptic malignant syndrome (NMS) was experienced only in two (1.5%) study participants. In these cases, patient might be needed to discontinue the medication causing the ADR and the drug was changed after the ADR was treated or after the patient was stabilized with supportive care. Those majorities of the participants who had undesirable effects were on FGA drug therapies. This was similar to the finding reported by T.K. Patel et al. (37). In contrary, the present study was not in line with study done in India (54), which reported antidepressant was the most common drugs cause of ADRs (45.7%), followed by antipsychotics (most commonly atypical antipsychotics (33.3%) and sedative-hyponotics (13.5%). Most likely, this disagreement might be due to antidepressant were the commonly prescribed drugs due to difference in disease condition (major depression vs all psychiatric disease) setting difference (out vs. inpatient) and the study design (cross-sectional vs. prospective). In addition, the present study was not line with the finding reported by Aashal Shah et al.(55), which reported mood stabilizer (59.46%) were the most common group of drugs associated with ADRs followed by atypical antipsychotics (25.04%), from the mood stabilizers Lithium accounts the highest percentage (61%) of ADR. This discrepancy might be due to the difference in duration of study period and the disease conditions majority of the participants were bipolar patients, so that the commonly prescribed drugs were mood stabilizers. Furthermore, in our study commonly encountered drug classes associated with DRPs were first generation, second generation antipsychotics and mood stabilizer.

The results obtained from multivariate logistic regression analysis indicated that differences between participants due to factors independently associated with the occurrence of DTPs. The associated factors for certain groups of participants; duration of treatment (>3 years)(AOR=18.2,CI 95%;2.0-62.0), participants with poly-pharmacy(AOR=8.84,CI 95%;1.46-23.5),and being current smoker(AOR=6.8,CI 95%;1.1-42.4) were increased the odds for developing DRPs. But participants who resided in rural areas had 68% lower than participants who resided in urban areas for the occurrence of DRPs. Number of medications per patient was not statistically associated with the occurrence of DRP. Conversely, it was well recognized that multiple drug use of patients with psychiatric come to be more prevalent, thereby increasing the tendency in developing DRPs.

In light of this event, previously conducted study (30) that assessed DRPs in patients with depression reported that number of medications per patient was associated factor for the occurrence of DRPs. This might be related to majority of the participants were on less two medications, with a mean (±SD) of 2.25±1.05 medications per patient and also the difference in disease conditions. Therefore, this variation might be indicated that, there was a lesser number of drugs utilization in Ethiopian patients with psychiatric disease in inpatient setting. Thus, some of participants were failed to be adhered to their prescribed additional drug therapy while needed. Indeed that, these differences explained due to factors associated with local cost of drugs in private and limited access to desired medications.

In the current study, the clinical pharmacist proposed one hundred thirty interventions from those interventions need additional drug was the most commonly (39.2%) proposed with comprehensive explanation and the physician acceptance rate was 69.2%. The acceptance rate of the current study was lower than finding from Germany the acceptance rate was 88.6 %(60). This discrepancy might be the difference in profession working in area, implementation of clinical pharmacist service might be well organized and experienced in developed countries, this might be lead to the difference.

6. Strength and limitation of the study

One of the strength of the current study is being prospective nature of the study this can avoids missing relevant information source from the characteristics of the patient which were missed in the card(in case of retrospective or cross sectional study design) and longer study period as compared to the previous study. In addition, being interventional study is also the strength of the study due to the reason that the drug related problems were solved timely rather than reporting the problems. The longer duration of study period is also the strength of the current study. Despite of this, a number of important limitations of this study need to be considered. Because the study was conducted in a single center public hospital and the sample size was also small. In addition physician suggestions reason for the occurrence of DRP and adherence were not studied.

7. Conclusion

The most common mental disorders encountered were schizophrenia, bipolar disorder and major depressive disorder. The magnitude of DRPs identified in admitted patients with psychiatric disease was considerably high. The most commonly identified DRPs were initiation of additional drug therapy, ineffective drug therapy and adverse drug reactions. Most of those DRPs were caused due to inappropriate drug selection, lack of adding synergistic or preventive drug therapy and undesirable effect of the drug. Factors independently associated with the occurrence of DRP were, participants on long duration of treatment, poly-pharmacy and place of residence, but number of medications and presence of co-morbid mental disorder were not statistically associated with the presence of DRP.

8. Recommendations

Based on our findings from the current study, the following recommendations were forwarded

For FMHACA and MOH

- ✓ To effectively establish and develop pharmaceutical care services especially in mental disorder.
- ✓ To establish nationwide specific and comprehensive guideline for the management of mental disorder.

For JUMC psychiatric ward

- ✓ Early identification, prevention and resolution may be vital in minimizing those problems.
- ✓ Making drugs available in affordable and effective/safer with lower possible price as needed.
- ✓ Prescribers should give special in patients with poly pharmacy and patients on long duration of treatment.

For researchers

- ✓ Conducting further studies with large sample size and multicenter is also recommended.
- ✓ Further similar research with clinical pharmacist intervention including outcome should be conducted for better understanding of the factors associated for the occurrence of DRPs and their outcome after intervention.

9. References

1. World Health Organization . The global burden of disease: 2004 update.
2. Federal Democratic Republic of Ethiopia Ministry of Health,National Mental health strategy 2012/13-2015/16.
3. Monteiro NM. Addressing mental illness in Africa: Global health challenges and local opportunities. Community Psychology in Global Perspective. 2015;1(2):78-95.
4. W. Edward Craighead DJM, Linda W. Craighead. Psychopathology-History, Diagnosis, and Empirical Foundations,3rd edition.
5. Procyshyn RM, Barr AM, Brickell T, Honer WG. Medication errors in psychiatry. CNS drugs. 2010;24(7):595-609.
6. Allemann SS, van Mil JF, Botermann L, Berger K, Griese N, Hersberger KE. Pharmaceutical care: the PCNE definition 2013. International journal of clinical pharmacy. 2014;36(3):544-55.
7. Basger BJ, Moles RJ, Chen TF. Development of an aggregated system for classifying causes of drug-related problems. Annals of Pharmacotherapy. 2015;49(4):405-18.
8. PC. E. PCNE classification for drug related problems. 2010;6.2(20):1-9.
9. R. JC. Pharmaceutical care practice : The clinician's Guide,3rd edition.
10. Ploylearmsang. JKaC. A short term outcomes of pharmaceutical care in Thai patients with schizophrenia. J Sci Technol. 2016;38(2):189-97.
11. Yusuff KB TF. Frequency , types and severity of medication use-related problems among medical outpatients in Nigeria. Int J Clin Pharm. 2011;33(0).
12. Leendertse AJ VDBP, Poolman JB, Stoker LJ, Egberts AC, Postma MJ. Preventable hospital admissions related to medication (HARM): cost analysis of the HARM study. 2011;14(1):34-40
13. Johnson J BL. Drug-related morbidity and mortality.Journal of Managed Care Pharmacy. 1996;2(1):137-145
14. Rothschild JM, Mann K, Keohane CA, Williams DH, Foskett C, Rosen SL, et al. Medication safety in a psychiatric hospital. General hospital psychiatry. 2007;29(2):156-62.

15. Nivya K, Kiran VSS, Ragoo N, Jayaprakash B, Sekhar MS. Systemic review on drug related hospital admissions–A pubmed based search. Saudi Pharmaceutical Journal. 2015;23(1):1-8.
16. Patient safety and psychiatry. Recommendations to the APA Board of Trustees Association. 2003.
17. Gillespie U AA, Henrohn D, Garmo H, Hammarlund-Udenaes M, Toss H, et al. A comprehensive pharmacist intervention to reduce morbidity in patients 80 years or older: a randomized controlled trial. Archives of internal medicine.169(9):894-900.
18. Kolli NV, Nandita Ragoo , B. Jayaprakash Mss. Systemic review on drug related hospital admissions . A pubmed based search Saudi Pharm J King Saud University. 2015;23(1):1-8.
19. Silva C RC, Luz I, Monteiro J, Fresco P. . Drug-related problems in institutionalized,polymedicated elderly patients: opportunities for pharmacist intervention. Int J Clin Pharm. 2015;37(2):327-34.
20. Lu Y HP, Abegunde D, Edejer T. 2011. The world medicines situation 2011. Medicine expenditures. World Health Organization, Geneva.
21. Yusuff KB, Tayo F. Frequency, types and severity of medication use-related problems among medical outpatients in Nigeria. International journal of clinical pharmacy. 2011;33(3):558.
22. Ernst FR, Grizzle AJ. Drug-related morbidity and mortality: updating the cost-of-illness model. Journal of the American Pharmaceutical Association (1996). 2001;41(2):192-9.
23. Viktil KK BH. The Impact of Clinical Pharmacists on Drug-Related Problems and Clinical Outcomes. Basic Clin Pharmacol Toxicol. 2008;102(3).
24. Ann Lykkegaard Soerensena LPN, Birgitte Klindt Poulsenb, Marianne Lisbyc and Jan Mainzd. Potentially inappropriate prescriptions in patients admitted to a psychiatric hospital. Nordic Journal of Psychiatry. 2016;15(2):1-11.
25. Peterson C, Gustafsson M. Characterisation of drug-related problems and associated factors at a clinical pharmacist service-naive Hospital in Northern Sweden. Drugs-real world outcomes. 2017;4(2):97-107.
26. Sridhar SB,Jabbar R. Monitoring of adverse drug reactions in psychiatry outpatient department of a Secondary Care Hospital. J Basic Clin Pharma 2016;7:80-6.

27. Nobutaka Ayani MS, Takeshi Morimoto, Toshiaki Kikuchi, Koichiro Watanabe, Jin Narumoto et al. The epidemiology of adverse drug events and medication errors among psychiatric inpatients in Japan: . BMC Psychiatry. 2016;16(303):2-8.
28. Sengul MCB, Karadag F, Sengul C, Karakulah K, Kalkanci O, Herken H. Risk of psychotropic drug interactions in real world settings: a pilot study in patients with schizophrenia and schizoaffective disorder. Klinik Psikofarmakoloji Bülteni-Bulletin of Clinical Psychopharmacology. 2014;24(3):235-47.
29. Leonor I, López O, Ernesto M, Rosés V. Drug related problems associated with the psychoactive drugs used on geriatric, hospitalized patients. Brazilian Journal of Pharmaceutical Sciences. 2012;48(3):453-60.
30. Mateti UV, Lalwani T, Nagappa AN, Bhandary P, Verupaksha D, Balkrishnan R. Assessment of drug-related problems in depressive patients. Perspectives in clinical research. 2015;6(1):58.
31. Pahari N, Tripathi SK, Maity T, Gupta BK, Bagchi C, Mondal DK. Evaluation and analysis of adverse drug reactions of second generation antipsychotics in a psychiatry out-patient department. Aggressive behavior. 2012;6:6.59.
32. Patel TK, Bhabhor PH, Desai N, Shah S, Patel PB, Vatsala E, et al. Adverse drug reactions in a psychiatric department of tertiary care teaching hospital in India: Analysis of spontaneously reported cases. Asian journal of psychiatry. 2015;17:42-9.
33. Jain T, Bhandari A, Ram V, Parakh M, Wal P, Nagappa AN. Drug interactions and adverse drug reactions in hospitalized psychiatric patients: a critical element in providing safe medication use. German J Psychiatry. 2011;14:26-34.
34. Ahmad A, Hussain A, Farhat S, Parveen S, Sawhney V, Ashai Z. Prevalence and Severity of Adverse Drug Reactions (ADRs) in patients subjected to different Anti-psychotic drugs in an Out-Patient Department of a Psychiatry Hospital in Kashmir; a prospective observational study. International Journal of Pharmacology. 2016;5(1):12-6.
35. Sridhar SB, Al-Thamer SSF, Jabbar R. Monitoring of adverse drug reactions in psychiatry outpatient department of a Secondary Care Hospital of Ras Al Khaimah, UAE. Journal of basic and clinical pharmacy. 2016;7(3):80.

36. Chawla S, Kumar S. Adverse drug reactions and their impact on quality of life in patients on antipsychotic therapy at a tertiary care center in Delhi. Indian journal of psychological medicine. 2017;39(3):293.
37. Tejas K. Patel a PHB, Nimisha Desai , Saurabh Shah, Parvati B. Patel ,Ela Vatsala. Adverse drug reactions in a psychiatric department of tertiary care teaching hospital in India: Analysis of spontaneously reported cases. Asian Journal of Psychiatry. 2015;17:42-9.
38. Mezgebe HB, Seid K. Prevalence of potenial drug-drug interactions among psychitric patients in Ayder referral hospital, Mekelle, Tigray, Ethiopia. Journal of Scientific and Innovative Research. 2015;4(2):71-5.
39. Alomar MJ. Factors affecting the development of adverse drug reactions. Saudi pharmaceutical journal. 2014;22(2):83-94.
40. Tesfay K, Girma E, Negash A, Tesfaye M, Dehning S. Medication non-adherence among adult psychiatric out-patients in Jimma University specialized hospital, Southwest Ethiopia. Ethiopian journal of health sciences. 2013;23(3):227-36.
41. Ilickovic IM, Jankovic SM, Tomcuk A, Djedovic J. Pharmaceutical care in a long-stay psychiatric hospital. Eur J Hosp Pharm. 2016;23(3):177-81.
42. Mohammad Ismail ZI, Muhammad Bilal Khattak2, ArshadJavaid3, Muhammad Imran Khan4, Tahir Mehmood Khan. Potential Drug-Drug Interactions in Psychiatric Ward of a Tertiary Care Hospital: Prevalence, Levels and Association with Risk Factors. Trop J Pharm Res.11(2):280-9.
43. Zaid Demoz BL, Gebrehiwot Teklay,Birhanu Demeke,Tewodros Eyob,Zewdneh Shewamene,Mubarek Abera4. Medication adherence and its determinants among psychiatric patients in an Ethiopian referral hospitals. Patient Preference and Adherence. 2013;8:1329-35.
44. Ivana M Ilickovic SMJ, Aleksandar Tomcuk,Jovo Djedovic. Pharmaceutical care in a long-stay psychiatric hospital. Eur J Hosp Pharm. 2015;0:1-5.
45. Tarun Jain1 AB, Veerma Ram, Manish Parakh, Pranay Wal, and Anantha Naik Nagappa. Drug Interactions andAdverse Drug Reactions in Hospitalized Psychiatric Patients. . German Journal of Psychiatry. 2011;14:26-34.

46. Jimma University Specialized Hospital;JUSH.Available from: http://www.ju.edu.et/jimmauniversity-specialized-hospital-jush.
47. MOH. Ethiopian Hospital Reform implementation Guidelines (EHRIG), Ethiopia Ministry of Health (MOH). 2014.
48. Standard Operating Procedures Manual for the Provision of Clinical Pharmacy Services in Ethiopia. Pharmaceuticals Fund and Supply Agency in collaboration with the United State Agency for International Development's Systems for Improved Access to Pharmceuticals and Services Program. PFSA. 2015.
49. Mickey RM GS. The impact of confounder selection criteria on effect estimation. American journal of epidemiology. American journal of epidemiology. 1989;129(1):125-37.
50. Bursac Z GC, Williams DK, Hosmer DW. Purposeful selection of variables in logistic regression. Source code for biology and medicine. 2008;3(1):17.
51. WHO. International Drug Monitoring : The role of national centres :Technical report series 498 .Geneva :WHO. 1972.
52. United State DoHHS. Dietary guidelines for Americans 2015-2020.Skyhorse Publishing Institition;2017.
53. Harichandran DT, Viswanathan MT, Gangadhar R. Adverse drug reactions among hospitalized patients in Psychiatry Department in a Tertiary Care Hospital. Journal of Health Research and Reviews. 2016;3(2):77.
54. Lucca JM, Ramesh M, Ram D, Kishor M. Incidence and predictors of adverse drug reactions caused by drug-drug interactions in psychiatric patients: An empirical study. Tropical Journal of Medical Research. 2016;19(1):29.
55. Aashal Shah, Mayur Chaudhari, Ankit Vatali YA, Kanthari, Ritambhara MehtA. A Prospective Study of Adverse Drug Reactions in Patients with Bipolar Disorder in psychiatry. Journal of Clinical and Diagnostic Research. 2017;11(5).
56. Nilanjan pahari SK, Tarasankar maity, Bijan Gupta, Chiranjib Bagchi. Evaluation and analysis of adverse drug reactions of second generation antipsychotics in psychiatry. International Journal of Pharmacy and Pharmaceutical Sciences. 2012;4(5).

57. P. Lakshmi KV, Gopineni Divya,T S Durga Prasa,, Sastha Ram V Kishoreand Dr. DivitiRanganayakulu. A Study on Adverse Drug Reactions of Antipsychotics in Psychiatry Patients of South Indian Hospital. Journal of Scientific Research in Pharmacy.2015;3(4):153-155.

Annexes

Annex I: Patient information sheet

Name of the principal investigator: Goitom Mengistu

Name of study area: Jimma University Medical Center

Research budget covered by: Jimma University

Research objective: This study was aimed to assess drug related problems and associated factors among psychiatric patients admitted to JUMC from March 01 to August 30, 2018.

Significance of the study: The outcome of this study will provide baseline information for future researchers and it will improve the awareness of health care professionals and policy makers about importance of pharmaceutical care practice. Hence, it will contribute to the formulation and implementation of pharmaceutical care services in the health care system policy.

Study procedure: Patient specific data will be collected using structured data collection tool to determine if the patient's drug-related needs are being met; i.e. all the patient's medications are appropriately indicated, the most effective available and the safest possible agent is used, and the patient is able and willing to take the medication as intended.

Risks: No risks except the time that patient spend during the interview.

Participant right: The patient has a right to stop the interview at any time, or to skip any question that he/she does not want to answer.

Benefit: The study is beneficial for the patient in improving quality of service delivery in future visits. It informs health care providers about the status of care. It also can be used as a source of information for the hospital and policy makers.

Incentives: You will not be provided any specific incentive for taking part in the research other than acknowledgment.

Confidentialities: The study result will not include patient's name and address and any information communicated will be kept confidential.

Agreement: Patients are expected to be fully voluntary to participate in the study.

Whom to contact: If you have any kind of inconveniencies about the study, please communicate the principal investigator; Goitom Mengistu: phone number: 0983947400 or email goitmen4@gmail.com

Annex II: Informed consent

Research title: Drug related problems and associated factors among psychiatric patients admitted to psychiatric ward at JUMC, Southwest Ethiopia, 2018.

Code number_____

1. I confirm that I understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is completely voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.
3. I understand that my medical notes will be looked at by data collectors of this study and necessary information will be extracted. I give permission for these individuals to have access to my records.
4. I agree to take part in the above study. I would like to confirm my agreement by signing.

Participant's name _____Signature_____ date_____

Name of the data collector: _____ Signature: _____ date_____

Name of the principal investigator: _____Signature: _____ date_____

Thank you for your participation and cooperation

Greetings!

My name is Sr. / Ato ----------

I am data collector for master student Goitom Mengistu currently working his research work for graduation in clinical Pharmacy in Jimma University, institute of Health and school of pharmacy.

The objective of the study is to assess drug related problems and associated factors among psychiatric patients admitted to psychiatric ward at JUMC from 01 March to August 30, 2018.

I would like to assure you that the study is confidential and secure i will not keep a record of your name and address. You have a right to stop the interview at any time, or to skip any question that you do not want to answer. Your correct answer to the questions can make the study achieve its goals. Therefore, you are kindly requested to respond genuinely and voluntary with patience.

Result of the interview:

1. Completed
2. Partially completed
3. The interviewee refused
4. Others_____

Annex III: Data collection tool

Jimma University
Institute of Health

School of Pharmacy

Data collection tool to identify drug related problems and associated factors among psychiatric patients admitted psychiatric ward in JUMC from March01- August, 2018.

A. Questioner English version

1. Participants' Socio demographic Characteristics and disease related questions

No	Questions	Response
1.	Card No	----------
2.	Patient's sex	□ Male □Female
3.	Age	_____in years
4.	Body weight	_____ in kg
5.	Height	_____in cm
6.	BMI	_____kg/m^2
7.	Marital status	1. Single□2. Married□ 3. Divorced □ 4.Widowed □
8.	Religion	1. Orthodox □ 2.Protestant□ 3. Muslim □ 4. Others--------
9.	Educational status	1. Non formal education □ 2. Primary education (1-8 grade) □ 3. Secondary education (9-12 grade) □ 4. Tertiary education (diploma and above) □
10.	Current Occupation	□ Housewife Farmer Unemployed □ Civil servant □ Other specify_____
11.	Monthly income in Ethiopian Birr?	_____ Birr
12.	Alcohol consumption	□ Yes : □No :
13.	If alcohols for Q.12, What type of alcohol do you take?	1. Beer 2. Caticala 3." Teg"4. " Tela" 5. others_____
14.	If yes for Q.13, how many times /week	□ one times □ two times □ ≥three times

15.	Cigarette smoking status	Never smoked □ Ex smoker □ Current smoker □
16.	If current smoker what is the amount of cigarette you smoke per day?	_____pieces /day
17.	Khat chewing status	□ Never □Sometimes □ All times
18.	Traditional and herbal medicine use	□ Yes □No
19.	If yes to Q. 18, What type of traditional medicine do you use?	_____
20. .	Other substance use status	1.Cannabis □ Cocaine □.Amphetamine □.Hallucinogen □ 5. Other specify_____
21.	Living status :	1. Living with family 2. Living with friends 3. Lives alone 4. Others--
22.	Residence	□ Rural □ Urban
23.	Pregnancy	□ Yes □No
24.	Breast feeding	□ Yes □No
25.	Number of hospitalization since the last one year	□ Zero times □ One times □ Two times □ ≥ Three times
26.	Source of medication fee	□ Free □ Payment
27.	Medication administration	□ Relatives, health workers
28	Income	----------ETB
29	Social support	□ No □ Yes

2. Data abstraction format /checklist(data from review of patients medical record)

a. Chief compliant ----------

b. History of present illness ----------

---

c. Initial date of diagnosis ----------

d. Duration on treatment----------

e. Documented/suspected ADR/Allergy if any----------
---

f. Past medical history (relevant illnesses, hospitalizations, surgical procedures, emergency department visits, injury)----------
---

---

g. Side effect and type of side effect----------

h. Past medication/immunization history

Indication	Drug therapy	Response	Year/month /date

i. **Vital signs:**

Date													
BP													
HR													
RR													
T^0													

j. Relevant laboratory results and investigations

Date				
LFT:	AST	ALT		
RFT:	BUN	Scr.		
CBC:	WBC		RBC	PLT
	Neutrophils= Lymph= Others=		Hct= Hgb= MCV=	
RBS/FPG	RBS		FBS	
Lipid Profile:	HDL	LDL	Triglyceride	Total cholesterol
Imaging diagnostics:				
Electrolyte	Na	K	Cl	Other
Troponin/CK-MB				
Others				

k. Medical conditions and medications

Date of admission	Working diagnosis	Drug regimen/added drug	Discharge date	Status on discharge

K. **Medication profile (for schizophrenia only)**

Current medication	**Reason for combination if any combination(it is possible to cite more than one reason)**	**Maintenance dose before combination (if there combination)**	**Monotherapy trial before combination**
FGA **1.** **2.** **3.** **4.** **SGA** **1.** **2.** **Other** **1._____** **2._____**	a. Inadequate response b.Intolrance to side effect from high dose c. Smoking d. Additive dosage effect e. Frequent relapse f. Poor compliance to po medications g.Other_____	**1.** **2.** **3.** **4.**	Drug used A. Single drug only b. Two drug alternatively c.≥ 3 drug alternatively
		1. **2.**	Trial duration a.<4weeks b.<6weeks c.≥6weeks d. Other_____

3. **Adverse Drug Reaction Probability Scale assessment (Naranjo scale)**

Question	yes	No	Don't know
1. Are there previous *conclusive* reports on this reaction	+1	0	0
2. Did the adverse event occur after the suspected drug was administered?	+2	-1	0
3. Did the adverse reaction improve when the drug was discontinued or a *specific* antagonist was administered?	+1	0	0
4. Did the adverse reaction reappear when the drug was re administered?	+2	-1	0
5. Are there alternative causes (other than the drug) that could have on their own caused the reaction?	-1	+2	0
6. Did the reaction reappear when a placebo was given?	-1	+1	0
7. Was the blood detected in the blood (or other fluids) in concentrations known to be toxic?	1	0	0
8. Was the reaction more severe when the dose was increased or less severe when the dose was decreased?	1	0	0
9. Did the patient have a similar reaction to the same or similar drugs in *any* previous exposure?	1	0	0
10. Was the adverse event confirmed by any objective evidence?	1	0	0

Scoring

9=definite, 5-8=probable, 1-4= possible, 0=doubtful

Cipolle's drug therapy problems classification system

Domains	Drug therapy problems	Possible causes
i. Indication	1. Unnecessary drug therapy	No medical condition at that time No need of drug for that condition Duplicate therapy Non-drug therapy indicated Treating avoidable ADR
	2. Needs additional drug therapy	Addictive or Recreational drugs Untreated indication Preventive or prophylactic Synergistic or potentiating
ii. Ineffectiveness	3. Needs different drug product	Inappropriate drug selection Condition refractory to drugs Dosage form inappropriate Not effective for the condition
	4. Dose too low	Wrong dose(sub-therapeutic dose) Frequency inappropriate Drug interaction Duration inappropriate
iii. Safety	5. Adverse drug reactions	Undesirable effect not dose related Unsafe drug for patient Drug interaction not dose related Allergic reactions Contraindication present
	6.	Wrong dose(over therapeutic dose) Frequency inappropriate Duration inappropriate Drug interaction Incorrect administration
iv. Adherence	7. Non-adherence	No willingness to take the drug Patient forget to take the drug Direction is not understood Patient cannot swallow/administer Cost of medication too expensive Unavailability of medication Disbelieves on the drug effectiveness Patient felt better or worse Fear of adverse events Regimen complexity

Planned intervention

- **I0. no intervention**

I1. Prescriber level **I3. At drug level**

- ☐ Prescriber informed only
- ☐ Prescriber asked for information
- ☐ Intervention proposed to prescriber
- ☐ Intervention discussed with prescriber

Drug changed to-----
Dosage changed to-----
Formulations changed to----
Instructions for use changed to-
new drug started

I2. At patient level

- ☐ Patient (drug) counseling
- ☐ Written information provided(only)
- ☐ Patient referred to prescriber
- ☐ Spoken to family member/care giver

Drug stopped
Frequency changed to----------

I4.Other intervention or activity

- ☐Other interventions (specify)—
- ☐Side effect reported to authorities

Acceptance and Implementation of intervention (tick one box only)

A1. Intervention accepted

- ☐ Intervention accepted and fully implemented
- ☐ Intervention accepted and partially implemented
- ☐ Intervention accepted but not implemented
- ☐ Intervention accepted and implementation unknown

A2. Intervention not accepted

- ☐ Intervention not accepted, not feasible
- ☐ Intervention not accepted, no agreement
- ☐ Intervention not accepted, due to other reason(specify)_____
- ☐ Intervention not accepted, unknown reason

A3. Other (no information on acceptance)

- Intervention proposed, acceptance unknown
- Intervention not proposed

Status of DRPs (outcome of intervention)

O0**.** Problem status unknown

O1. Problem totally solved

O2. Problem partially solved

O3.Problem not solved

- Lack of cooperation of patient
- Lack of cooperation of prescriber
- Intervention not effective
- No need or possibility to solve problem

4. Summary of DRPs

Date	S/n	Type of DRP	Causes	Intervention	Status of intervention

5. Logical questions to identify whether or not the patient is experiencing drug therapy problem

1. is the medication (indication) appropriate?

a. Is there a clinical indication for each medication being taken?

b. Are all of the patient's medical conditions that can benefit from drug therapy being treated?

2. Is the drug therapy effective for the disease condition?

a. Is the most effective drug product being used?

b. Is the dosage of the medication sufficient to achieve the goals of therapy?

c. Is the dosage form appropriate?

3. Is the drug therapy as safe as possible?

a. Is there any adverse drug reaction being experienced?

b. Is there any sign of toxicity (based on clinical parameters (signs and symptoms) or lab. values)?

Questionnaire Amharic Version

<u>የታካሚ መረጃ ወረቀት</u>

የተመራማሪ ስም: ጎይቶአም መንግስቱ

ጥናት የሚካሄድበት ቦታ: ጅማ ዩኒቨርስቲ ሜዲካል ሴንተር

የትናቱ በጀት ከፋይ: ጅማ ዩኒቨርስቲ

የትናቱ አላማ:በአእምሮ ህመም ምክንያት ተኝቶ የሚታከሙ ላይ ከመድሀኒት የተያያዙ ችግሮች መገምገም እናወሳኝ ነገሮችን መለየት።

የጥናቱ ጠቀሜታ:ጥናቱ ለጤና ባለሞያዎቸ እናለፖሊሲ አውጪዎች ስለመድሃኒት አጠቃቀም እናችግሮቻቸው ያላቸው ትኩረት እነዲጨምርያረጋል። በተጨማሪም በተመሳሳይ ዙርያ ወደፊት ለሚሰሩ ጥናቶች መሰረታዊ መረጃ ይሰጣል።

የጥናቱ ሂደት: መረጃ ሰብሳቢ ሰዎች የተሳታፊውን ፍቃድካገኙ በኋላ በማስጠየቅያ ወረቀት ቃለመጠይቅ ያረጋሉ። ከዛበመቀጠል ከመዝገብ ካርዱ የተመዘገበውን መረጃ ይወስዳሉ።

ጉዳት: ጥናቱምንምአይነትጉዳትየለውም።

የተሳታፊ መብት:ተሳታፊው ቃለመጠይቁን በፈለገው ሰአት ማቋረጥ እንዲሁም ያልፈለገውን ጥያቄ አለመመለስ ይችላል።.

ጥቅም:ጥናቱ ለቀጣይ ግዜ ጥራት ያለውን አገልግሎት ለመስጠት ይጠቅማል።

ማበረታቻ: በጥናቱ ላይተሳታፊ በመሆን የሚሰጥ ምንም አይነት ማበረታቻ የለውም።.

ምስጢር ጠባቂነት:ጥናቱ የተሳታፊውን ስም፣አድራሻ እናሌላ ያስተላለፈውን መልእክት በተገቢው መልክ ይጠብቃል።

ስምምነት: ታካሚው በሙሉ ፍላጎት ተሳታፊ እንደሚሆን ይጠበቃል።.

ለተጨማሪ መረጃ የዚህ ጥናት አስተባባሪ ማነጋገር ይችላሉ።

ስም፡ጎይቶአም መንግስቱ

- ስልክ: 0983947400
- ኢሜል:goitmen4@gmail.com

<u>በጥናቱ ለሚሳተፉ የስምምነት ማረጋገጫ</u>

እኔ ስለዚህ ጥናት ሙሉበሙሉ ተነግሮኝ ተረድቻለሁ።አላማውም በኣእምሮ ህመም ምክንያት በሆስፒታል

ህክምና ላይያሉ ከመድሀኒት የተያያዙ ችግሮች መገምገም እናወሳኝ ነገሮችን መለየት።

ይህ ተሳትፎ በፈቃደኝነት ላይየተመረኮዘ መሆኑን ተረድቼለሁ። በተጨማሪም የተረዳሁት በዚህተሳትፎየ አገኛኛለሁ የምለውምንም አይነት የተለየ አገልግሎት: ክፍያ ወይም ስጦታ እንደማይኖር ተረድቻለሁ።

ይህውል የሚያገለግለው ለዚህ ብቻ ነው።

ከዚህ በታች ስሜ ያለው በዚህ ጥናት ለመሳተፍ ተስማምቼለሁ።

የተሳታፊስም_____ፊርማ_____ቀን_____

የመረጃ ሰብሳቢ ስም: _____ : ፊርማ _____ ቀን_____

የተመራማሪ ስም: _____ ፊርማ: _____ ቀን_____

ለተሳትፎችሁ እናድጋፋቹሁ አመሰግናለሁኝ

ስሜ:አቶ/ወ/ሪት_____

እኔ የጎይቶኦም መንግስቱ የሚባል በአሁን ሰአት ለምረቃ ማስተርስን የሚሰራ መረጃ ሰብሳቢ ነኝ።

የጥናቱ ዋናአላማ በኣእምሮ ህመም ምክንያት ሆስፒታል ህክምና ላይያሉ ከመድሀኒት የተያያዙ ችግሮች መገምገም እናወሳኝ ነገሮችን መለየት ነው።

ጥናቱ ምስጥር ጠባቂ መሆኑን ላረጋግጥላቹ እወዳለሁኝ ቃለመጠይቁን በፈለጋችሁት ሰአት ማቋረጥ ትችላላችሁ በዚህ ጥናት ምላሽበ መስጠት በማገዛችሁ በጣምአመሰግናለሁኝ።

የቃለ መጠይቁ ውጤት

አልቀዋል_____ በከፊል አልቀዋል_____

ሌላ_____ ተነፍገዋል _____

ሀ. የታካሚ ማህበረሰባዊ ጥያቄዎች/ባህርያቶች

መምርያ: በተዘጋጀውን ሳጥን ምልክት√ ያድርጉ በተጨማሪ ታካሚውን በመጠየቅ ክፍትቦታውን ይምሉ።

ተራቁ	ጥያቄዎች	
1.	ካርድ ቁጥር	_____
2.	የታካሚ ጸታ	ወንድ□ ሴት□
3.	እድሜህ ስንትነው?	_____አመት
4.	የሰብነት ክብደት	_____ኪ. ግ
5.	የጋብቻ ሁኔታ በተመለከተ	1. ያላገባ □ 2.ያገባ□ 3.የተፋታ□ 4.ባሏ/ሚስቱየሞተባት/በት□
6.	ሃይማኖትህ /ሽ ምንድነው?	1. ኦርቶዶክስ□ 2.ፕሮቲስታንት□ 3.ሙስሊም□ 4.ሌሎች_____
7.	ክፍተኛ የትምህርት ደረጃህ/ ሽ ስንትነው?	1. መደበኛየትምህርትደረጃየለኝም□ 2. ከ1_8□ 3. ከ9.12□ 4. ዲፕሎማእናከዛበላይ□
8.	ስራህ /ሽ ምንድን ነው?	----------
9	ወርሃዊ ገቢህ ስንትነው?	_____ብር
10.	የአልኮሆል መጠጥ ሁኔታ	ነ. ጠጥቼ አላቅም□ 2. እጠጣ ነበር□ 3. አንዳአንዴ እጠጣለሁ□ 4. ሁሌ እጠጣለሁ□
11.	ጥያቄ 10 መልሱ አዎ ካልክ/ክሽ ምንአይነትአልኮሆል ትወስዳለህ/ለሽ?	1. ቢራ□ 2. ካቲካላ□ 3. ጠጅ□ 4. ጠላ□ 5. ሌላ_____
12.	ጥያቄ11 መልሱ አዎ ካልክ/ክሽ በሳምንት ስንት ግዜ?	□ አንድ ግዜ □ ሁለት ግዜ □ ሰወስትና ከዚያ በላይ

13.	የሲጋራ ማጨስ ሁኔታ?	1. አጭሴአላውቅም 2. አጨስነበር 3. አሁንምአጨስአለሁኝ
14.	አሁንየምታጨስ ከሆነ በቀን የምታጨሰው ሲጋራ ብ ስንትነው?	_____በቀን
15.	ድሮታጨሽ ከነበርክ/ሽ ለስንትግዜ አጫሽነበርክ/ሽ?	ለ_____አመት
16.	የጫት መቃም ሁኔታስ?	ቅሜ አላውቅም እቅምነበር አንዳአንዴእቅማለሁኝ ሁሌእቅማለሁኝ
17.	የባህል መድሃኒት ወስደህ/ሽ ታቃለህ/ሽ?	1. አዎ 2. አይደለም
18.	ጥያቄ 17አዎ ካልክ የወሰድከው ባህላዊ መድሃ አይነትነው?	_____
19.	ማን ጋር ነው ምትነረ/ሪው?	1. ከቤተሰብ 2.ከጎረቤት 3. ብቻየነውምነሮው 4.ሌላ------
20.	መኖርያ በተመለከተ	ገጠር ከተማ
21.	እርጉዝ ነሽ?	አዎአይደለም
22.	ጥብ ማጥባት	አዎአይደለም
23.	ከባለፈው አመት ወደዚ ያለው ስንት ግዜ ሆስፒታል ተኝተዋል/ተችተሻል?	ምንም አንድ ግዜ ሁለት ግዜ ≥ ሶስት ግዜ
24.	በሽታዎ በምርመራ ከተረጋገጠ ስንት ወር አደረክ/ግሽ?	----------ወር
25.	ህክምና ከጀመሩ ስንት ወር አደረክ/ግሽ?	----------ወር
26.		

ለ.ከመድሐኒት የተያያዘ ጉዳት/ የሰብኒትቁጣ ግምገማ

1. ከባለፈውዐመትወዲህያለውግዜከምምትወስደውመድሀኒትየተያየዘየልተለመደሁኔታ/የሰብነትመቆጣትአጋትሞህያቃል?
□አዎ □አይደለም
አዎ ከሆነ የሁኔታው ምልክት ግለጽ ----------

2. ከባለፈውዐመትወዲህያለውግዜከምምትወስደውመድሀኒትየተያየዘየልተለመደሁኔታ/የሰብነትመቆጣትአጋትሞህያቃል?
□አዎ □አይደለም

4. ጉዳቱ መድሃኒቱ ከወሰድከው በኃላ ነው የተከሰተው?
□አዎ: □አይደለም: □አይታወቅም

5. መድሃኒቱ ከተቓረጠ በኃላ ጉዳቱ አሻሽለዋል?
□አዎ: □አይደለም: □አይታወቅም

6. መድሃኒቱ እንደገና ስትወሰድው/ጅው ምልክቱ/ጉዳቱ እንደገና ተከስተዋል?
□አዎ: □አይደለም: □አይታወቅም

7. ከመደሃኒቱ ዉጭ ሌላ እንደዚ ዓይነት ጉዳት ሊያመጣ የሚችል አለ?
□አዎ: □አይደለም: □አይታወቅም

8. ጉዳቱ የመድሃኒቱ መጠን ሲጨምር ብሰዋል ወ ይም የመድሃኒቱ መጠን ሲቀነስ ቀንሰዋል ?
□አዎ: □አይደለም: □አይታወቅም

9. ከዚ በፊት እንደዚ ዐይነት ተመሳሳይ ምልክት/ጉዳት ለተመሳሳይ መድሃኒት አጋጥሞህ ነበር?
□አዎ: □አይደለም: □አይታወቅም

Questioner Afan Oromo version

1. **<u>Waraqaa odeeffannoo hirmaataa</u>**

   Maqaa Qorataa;-Goitom Mengistu

   Bakka qorannochi itti Godhamu;- Hospitaala Speeshaalayizdii Yuniversitii Jimmaa

   Baajata qorannichaaf kan kanfalu;- Yunivarsitii Jimmaa

   Faayidaa qorannichaa:oggeessotaa yaalaatii fi qaamolee poolissii fayyaa baasaniif odeeffaannoo qorichaa haalaa barbaachisaa ta'een akka fayyadamanii fi tarkaanffii barbaachisaa ta'ee akka fudhataniif ni gargaara. Akkasumas namoota gara fulduratti qorannoo gaggeessaniif odeeffaannoo bu'uurawwa ta'e ni kenna.

   Adeemssi xinxalichaa ;- Namoonni ragaa sassaaban hayyama hirmaatoota erga argatani booda waraqaa ittiin gaafataman irrati gaafii afaanii ni godhu. Itti aansuudhaanragaa kaardii galmee irrati galmaa'e ni fudhatu.

   Miidhaa;- xinxalichi miidhaa gosa kamiyuu hin qabu.

   Mirga hirmaatichaa;- hirmaataan gaaffii afaanii yeroo barbaadetti addaan kutuu akkasumas gaafii inni hin barbaadne deebisuu diduu ni danda'a.

   Faayidaa;- xinxalichi yeroo itti aanuuf tajaajila qulqulina qabu kennuuf ni fayyada.

   Jajjabeessaa;- xinxalicha irrati hirmaachuudhaan faayidaa jajjabeessaa kennamu gosa kamiiyuu hin jiru.

   Iccitii Eeguu;- xinxalichi maqaa hermaatichaa teessoofi ergaa kan biraa dabarsse bifa seera qabeessa ta'een ni eggata.

   Walta'inssa;- yaalamaan fedhii guutuudhaan hermaataa ta'uun irraa egama.

Ragaa dabalataaf qindeesoota xinxalicha kana dubisuun ni danda'ama.

1. .Obbo Goitom Mengistu Qormaamataa Xinxalichaa

   Bilbila;- 0983947400

   Emeail;-goitmen4@ gmail.com

1. **Qajeelffama**;- Sanduuqa qophaa'eti mallttoo gudhaa, Dabalataan yaalamaa gaafachudhaan iddoo banaa guutaa

No	Questions	Response
1.	Saala Yaalamaa	1. Dhiira□ 2. Dubara.□
2.	Umurii	Waggaa_____
3.	Ulfaatina	_____kg
4.	Akkaataa fuudhaaf heeruma	1. Kan hin fuune□ 2. Kan fuudhe □ 3. Kan walhiike□ 4. Dhirssa (niitiin kan irraadu'e(duute)□
5.	Amanttaan kee maalidha?	1. Ortodoksii□ 2. Pirootestaanttii □ 3. Musliima□ 4. Kan biroo_____
6.	Sadarkaan Barumassa kee inni ol'aanaan meeqadha?	1. Sadarkaa barumssa idilee hinqabu□ 2. 1-8□ 3. 9-12□ 4. Dipiloomaafi isaan ol□
7.	Hojii/dalagaa	_____
8.	Galii jiha qarshii Itiyoophiyaatiin?	Birrii_____
9.	Alkoolii ni dhugdaa?	□ Eeyyee : □ :Lakkii/mitii
10.	Gaafii 9 deebiin isaa eeyyee yoo jette dhugaatii gosa kam fudhata?	1. Biiraa□ 2. Araaqee □ 3. Daadhii□ 4. Farsoo □ 5. Kan biroo_____

11.	Gaaffii 10f deebii isaaeeyyee yoo jettee, torbanitti guyyaa meeqa taha?	□T okko □ Lama □ Sadii fi isaa ol
12.	Tamboo ni xuuxxaa?	Gonkumaa xuuxee hin beekuu □ Dura nan xuuxan turee □ Yeroo Amma kana xuuxaan jira □
13.	Yoo yeroo ammaa kana xuuxaa jirta tahee guyyaatti hangam xuuxxa?	Guyyaatti_____
14.	Akkam Jimaa ykn Caatii ni fayyadamtaa?	□ Gonkumaa □Yeroo tokko tokko □ yeroo mara
15.	Akkam dhibee kee kanaaf qoricha aadaa ni fayyadamtaa?	□ : Eyyee □ :Mitii
16.	Gaaffii 15f deebii isaa eeyyee yoo jettee, Yaala/qoricha aadaa kan akkamii fayyadamta?	_____
17.	Gargaarsa hawaasa:	1. Gargaarsa maatii 2. Qophaa jiraadha:
18.	Bakka Jireenyaa	□ Baadiyaa □ Magaalaa
19.	Haala ulfaa	□ : Eyyee □ :Mitii
20.	Daahima hoosiftuu qabdaa?	□ : Eyyee □:Mitii
21.	Jihoota 20 n darban keessatti kutaa yaalii tasaa dhuftee beektaa?	□ Gonkumaa □ Al tokko qofa □ Lamaa fi isaa ol
22.	Jihoota 20 darban keessatti siha meeqaa hospitaala ciistee?	□ Gonkumaa □ Al tokko qofa □ Lamaa fi isaa ol, yaalamtee beektaa

8. Madaalli midhaalee qorichaan dhufanii ykn allerjii

1. Jihoota 12’n darban keessatti midhaalee qoricha waliin wal qabatan si muudatanii beekuu? □:Eyyee□:Mitii

   Yoo eeyyee jettee akkam si godhee ----------

2. Gaaffii 1 f eeyyee yoo jettee gaaffilee armaan gadii deebisii.

a. Midhaan cinaa tasaa kun qoricha fidaa jettee yaadduu erga fuudhatteen booda uumamee?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

b. Midhaan cinaa kun yeroo qoricha fuudhattuu sitti foyyahee?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

c. Midhaan cinaa kun yeroo qoricha fidee jettee shakkituu fuudhattu sitti deebihee?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

d. Waanti biraa qorichaan alatti midhaa cinaa ati jettuu sirratti fidee ni jira?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

e. Midhaan cinaa ati jettuu kuni hanga qoricha ati fuudhattuu irratti ni hundahuu?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

f. Kanaan Midhaa cinaa kana fakkatuu qoricha kana ykn kana fakkaatuu fuudhattee booda ofirratti argitee beektaa ?

□ : Eeyyee □:Lakkii □ Ani hin beekuu

Declaration

I, the undersigned ,declare that this thesis is my original work and agrees to accept for the scientific ethical and technical conduct of the research project and provision of required progress reports as per terms and conditions of Jimma university, institute of health(funding organization) in effect at the time of grant is forwarded as the result of this application.

Name:_____

Signature_____Date_____

Place: Jimma University

Date of submission_____

This thesis has been submitted for final submission with approval of internal examiner and advisors.

Internal examiner

Mr. Bodena Bayisa (B.pharm, MSc in clinical pharmacy)

Date_____

Signature_____

Advisors

Mr.Girma Mamo (B.pharm,MSc, Assistant Professor)

Date_____Signature_____

Mr. Habtemu Jarso (Bsc, MPH, Assistant Professor)

Date _____Signature_____