



Prescribing patterns of medicine using WHO prescribing indicators at the Out-patient department of Galkayo South Hospital, Mudug region, Somalia.

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Dedication

I dedicate this thesis to my beloved parents who helped me countless times and believed in me all the time especially when I didn't believe myself.

Acknowledgment

In the Name of Allah, the Most Merciful, the Most Compassionate all praise be to Allah, the Lord of the worlds; and prayers and peace be upon Mohamed His servant and messenger.

My dearest wife who lead me through the valleys of darkness with light of hope and constant support during this period and to our kids Mohamed Amin and Abdullahi Ayman whom without their love I could not have made this journey.

Professor Lars L Gustafsson, my supervisor, my teacher who took this difficult mission to teach the essence of research to a novice without losing hope. Although he was living far away, he was yet always so near and available for my support. Without his immense patience, knowledge, motivation and never losing hope of me I would not dreamed of completing this work. I will always remember you Professor Lars G Gustafsson.

I also give my gratitude to my local mentor and supporter who close at hand when I needed someone to discuss with and the leadership of Kalkayo University who allowed me to carry this research work.

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Abstract

Background

Irrational use of medicines such as polypharmacy, overuse of antibiotics and injections is an international problem which costs a lot both to countries and to patients worldwide in terms of money and side effects. The problem is more prevalent in less developed countries with substantial waste of meagre resources and side effects. In Somalia, where government is very weak and has other more pressing problems control of medicinal use has fallen in the backyard but there are no studies on the magnitude of the problem. The overall aim of this study was to investigate the prescribing pattern of medicines in the out-patient department of Galkayo South Hospital in Mudug, Somalia using the Drug Use Indicators developed by the World Health organization.

Method

Cross-sectional descriptive study we collected all prescriptions issued at the hospital out-patient during an 8 day period spread over two months. Moreover, the only three doctors working at the out-patient were interviewed on their knowledge on rational use of drugs and World Health Organizations standard treatment guidelines. Prescription data collected was analyzed according to four pre-set indicators using Microsoft Excel and presented as graphs and tables. In total.

Results

1385 prescriptions were collected, around 173 patients per day. Thirty five percent (35%) of the patients were males while the remaining sixty five percent (65 %) were females. Almost all ages were represented between 3 months to 79 years old. In total 3014 medicines were prescribed of which 946 (31.2%) were antibiotics and 889 (29.5%) were analgesics. Most prescribed antibiotics were amoxicillin, metronidazole and albendazole. The total numbers of medicines prescribed with their generic names were 965 (70%).

In conclusion from the findings of this study which is the first of its kind in the area show a clear high prevalence of irrational use of drugs in terms of polypharmacy and overuse of antibiotics and poor knowledge of drug prescribers about the rational use of drugs and existing WHO standard treatment guidelines.

Abbreviations

WHO: World Health Organization

GSH: Galkayo South Hospital

UTI: Urinary Tract Infection

MCH: Maternal and Child Health

INRUD: International Network for the Rational Use of Drugs

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1 Introduction

1.1 Background

More than 50% of all medicines worldwide are prescribed, dispensed, or sold inappropriately worldwide while 50% of patients fail to take them correctly. Conversely, about one-third of the world's population lacks access to essential medicines. Treatment with medicines is one of the most cost-effective medical interventions known, and the proportion of national health budgets spent on medicines ranges between 10% and 20% in developed countries and between 20% and 40% in developing countries (1). Thus, it is serious that so much medicine is being used in an inappropriate and irrational way.

Common types of irrational use of medicine include:

- The use of too many medicines per patient (polypharmacy);
- Inappropriate selection of drugs for diseases diagnosed with patients.
- inappropriate use of antibiotics, often in inadequate dosage, for non-bacterial infections;
- Over-use of injections when oral formulations would be more appropriate;
- Failure to prescribe in accordance with clinical guidelines;
- Inappropriate self-medication, often of prescription-only medicines.

There are many factors contributing to irrational use of medicines.

Three different factors can be identified:

- Health professionals incorrectly diagnose diseases due to lack of training, independent information about medicines and confidence to own competence.
- Weak health Systems with ineffectively implemented regulations on ethical principles in patient care and for registration of medicines. Other systems related factors include, unreliable medicines supply systems shortage of qualified health workers and absence of monitoring and supervision systems.
- Misleading beliefs, poor knowledge about diseases and treatments of patients and lack of good communications contribute to irrational use of medicine.

Lack of access to medicines and inappropriate doses result in increasing morbidity and mortality, particularly for childhood infections and chronic diseases such as hypertension, diabetes, epilepsy and mental disorders.

Inappropriate use and over-use of medicines is a waste of resources – often out-pocket payments by patients. It also results in significant patient harm in terms of poor patient outcomes and adverse drug reactions.

The over-use of antibiotics is leading to increased antibiotic resistance while the use of non-sterile injections is leading to the transmission of hepatitis, HIV/AIDS and other blood-borne diseases. Irrational use of medicines can stimulate inappropriate patient demand, and lead to reduced access and attendance rates due to medicine stock-outs and loss of patient confidence in the health system (1).

Inappropriate use of antibiotics is not only giving an antibiotic where or when it is not indicated. It can also be giving the correct antibiotic for an incorrect duration, i.e., too long or too short a time. In some cases, the correct antibiotics can be given in combination with medicines that interact with the antibiotic, in which case the therapeutic benefits are minimized according to University of Washington, 2000.

1.2 Drug use in Somalia according to WHO

Essential drugs program in Somalia ceased with the collapse of central government and the infrastructure of the Ministry of Health in 1991. Access to essential drugs, particularly through public health services, is low and variable depending on the local presence of donor supported programs. Lack of access to essential drugs of good quality is making a large number of Somali people compromise their health and lives.

National drug policies based on essential drugs are not well developed. Non-qualified and often inappropriate sale of medicines in the informal private sector has expanded without any control. Quality of drug imported into the country is doubtful. There is no functioning regulatory system of quality control for drugs in the country. This is particularly serious in view of the widespread and thus currently uncontrolled importation of medicines of undeterminable quality. Although in the Northwest and northeast steps have been initiated to regulate pharmaceutical sector in their respective zones. However, neither of the zonal authorities have the capacity to enforce the regulations developed.

Pharmaceutical supply to public health institutions is dependent on international aid. Different agencies and the remnants of the health facilities have been using drugs which are not always appropriate for the prevailing health priorities and which may be unnecessarily expensive.

Today, drugs are brought to the country, mainly through international aid organizations and the private sectors. Public financing for drug purchasing is largely provided by Western donors, and Western and Islamic charities, but no quantification is available, mainly of the latter sources. Private financing is substantial, as suggested by the proliferation of drug selling outlets. Many channels supply private health care providers. No large-scale private scheme is said to be in place.

Since 14 years, UNICEF ensures the supply of PHC kits to about 300 facilities, mainly MCH clinics, across the whole of Somalia. Since two years, UNICEF has introduced a complementing system, supplying additional basic drugs according to requests from facilities. UNICEF / WHO / GFATM support the supply of drugs needed by disease control programs, like malaria or tuberculosis. Many NGOs supply the hospitals they support with drugs acquired through their own channels. No supply system shared by many partners is in place, which results in diseconomies of scale.

In Somaliland, drugs are taxed at the entry port, which could provide a way to estimate their value. Many of the drugs imported into Somalia might be exported to neighboring countries thereafter. In 2001, very poor standards of storage and distribution were reported. Drugs are stored in small amounts at multiple points, which make their proper handling difficult. Most staff managing drugs lack professional skills.

Private suppliers are handling drugs without the care required to ensure the activity and safety of the products. Sporadic quality controls have given worrisome results. The substantial drug expenses incurred by Somali people are therefore likely to translate into the purchase of ineffective and dangerous preparations.

Absolute deregulation and commoditization prevails in Central / Southern Somalia. The health authorities of Puntland and Somaliland have issued regulatory provisions, which remain to be enforced. Overall, drug selling outlets are now counted in the thousands, representing an important source of income. Some agencies rely on Kenyan laboratories, considered as reliable; to submit the drugs they use to test. No pre-service pharmacy training program is provided within Somalia. Skills have been acquired on the job, or not at all. No information about the number of cadres active in the pharmaceutical area has been found. Both pre-service and in-service training programs are needed to improve the performance of drug handlers. The design of these programs must address the demands generated by the advanced privatization of health care delivery (2).

1.3 Study Objectives

General Objective:

The general objective of the study is to assess the prescribing pattern of medicine in the Out-patient department of Galkayo South hospital using WHO core indicators for prescriptions.

Specific Objectives

- To measure the extant of prescribed antibiotics in the study period at GSH.
- To identify the most prescribed antibiotics at GSH.
- To determine the most diagnosed disease at GSH.
- To measure the extant of drugs prescribed using their generic name at GSH.
- To identify factors leading to doctors to inappropriately prescribe medicine by using the WHO core of drug indicators.

Research Question:

What is the extent of irrational use of medicine in Galkayo city especially at GSH?

Do prescribers at Gakayo South Hospitals follow the WHO guideline for prescribing medicine?

1.4 Problem of the statement

Since the collapse of Somali central government in 1991, most of regulations and administrations have been destroyed or not enforced including monitoring of imported drugs or guidelines used when prescribing medicine. Most of the drugs used in Somalia are imported from different countries, there is no process in place to check their quality or expiration date, and most of those imported drugs are sold or dispensed in pharmacies and hospitals. So any patient or person is able to buy drugs without prescription. Since inappropriate use of drugs is evident in Somalia especially in Galkayo city, and the problem is wide, this research will only focus on prescribing patterns at the out-patient of galkayo south hospital. May be in the future research could be made drug dispense in the pharmacies.

1.5 Significance of the study

Since there are no studies done earlier to show pattern of prescriptions in Primary Health Care facilities in Somalia, this study was intended to shed light on this issue by investigating prescription pattern of one of the busiest public hospitals in Somalia, located in Galkayo city, Mudug region. Moreover, the study results and findings will be valuable for decision makers and regional donors to health facilities in Somalia.

1.6 Justification of this research

Medicine use is important and improves quality of life of the population but it is also important to be used and dispensed under the regulation set by the WHO/INRUD in order for patients to be safe. Since there is no available data to show us whether Somali public and private Hospitals are following these regulations, this study is intended to get some idea how the use of medicine in Somalia is by investigating the out-patient department of one public hospital supported by NGOs that is located in Galkayo city Mudug region.

2 Literature review

Medicines play a crucial role in improving the health outcome of population. However, improved access to quality medicines is not enough to get benefit from medicines, but also the appropriate use which has become a global concern.

A major step towards rational use of medicines was taken in 1977, when WHO established the 1st Model List of Essential Medicines to assist countries in formulating their own national lists. The present definition of rational use was agreed at an international conference in Kenya in 1985. In 1989, the International Network for the Rational Use of Drugs (INRUD) was formed to conduct multi-disciplinary intervention research projects to promote more rational use of medicines (3). Following this, the WHO/INRUD indicators to investigate drug use in primary health care facilities were developed. This methodology is widely and regularly used .

The WHO and INRUD have developed three types of indicators, these are:

The prescribing indicators:

- Average number of medicines per encounter:
- Percentage of medicines prescribed by generic name:
- Percentage of encounters with antibacterial prescribed:
- Percentage of encounters with an injection prescribed:
- Percentage of medicines prescribed from essential drugs list or formulary.

Patients care indicators:

- Average consultation time
- Average Dispensing time
- Percentage of medicines actually dispensed
- Percentage of medicines adequately labeled
- Patients' knowledge of correct dosage

Health Facility Indicators:

- Availability of copy of Essential Medicines List or Formulary
- Availability of key medicines

In this research we will only be focusing on prescribing indicators and how Galkayo south Hospital adheres to these indicators.

2.1 Use of medicines in Europe

Over 90% of all antibiotics are prescribed at the primary care level in Europe, and are mostly prescribed for respiratory tract infections in children (4-6). The main causes of antibiotics prescribing are Upper Respiratory Tract Infections (URTI) acute tonsillitis, bronchitis and otitis media, however these are mostly viral self-limiting conditions and no antibiotic treatment is needed according to the authors.

A longitudinal study conducted in 25 European countries between 1997 and 2003, also showed that, the volume of outpatient antibiotic use increased with high seasonal variation (increase of 30% in the first and fourth quarters compared with the second and third quarters), and penicillins were the most prescribed outpatient antibiotics, while the use of cephalosporins, tetracyclines and sulphonamides remained the same or decreased, but quinolones increased (7).see figure 1.

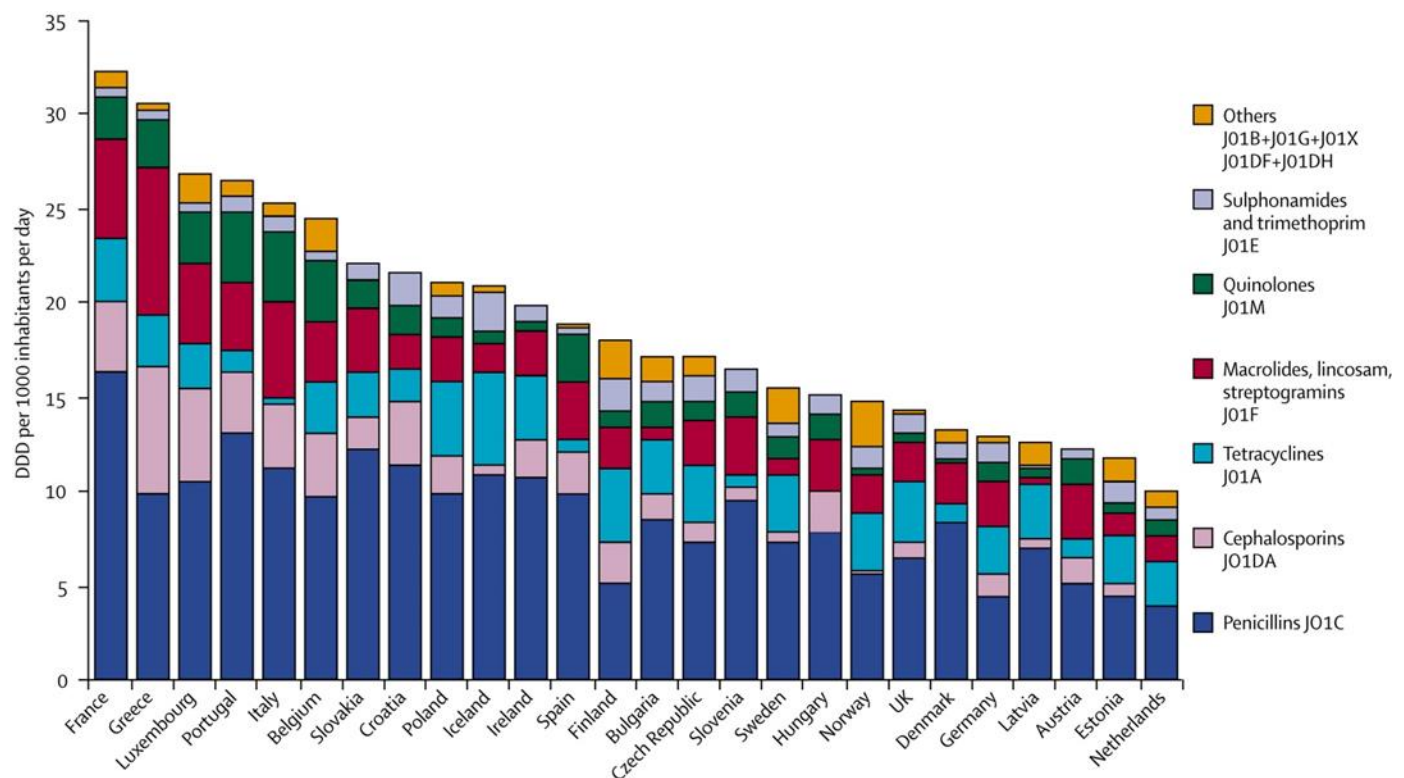


Figure 1: Antibiotic prescriptions pattern in Europe.

A cross sectional survey titled 'The Prevalence of Prescribing Antibiotics by Primary Health Care Physicians in Turkey: A multi-centered Survey' in which 267 physicians participated. The study reported that 22.6% of the reviewed prescriptions had antibiotics. The most prescribed antibiotics were amoxicillin+ clavulanic acid (15.6%) and amoxicillin + sulbactam (15.1%). Of the conditions recorded, acute upper respiratory infections accounted for 53.3% and UTIs accounted for 16.4% (8), however in Somalia we don't have any study to compare these findings. But we are hoping that this research will show the level of irrational use of medicine in some part of Somalia.

2.2 Use of medicines in Asia

A study in Cambodia revealed that the percentage of medicines with antibiotics was 66%, the use of unnecessary injection was 0.9-4.5%, the average number of medicines per encounter was 2.3, the average consulting time and dispensing time was 4 minutes for each, and the appropriate prescription of Oral Rehydration Salt for treatment of Diarrhea in under five years children was only 3.3% (9), this study shows that most of the indicators were optimal and prescribers followed WHO guideline of drug use.

A drug utilization review was carried out in the medical outpatient department of the Manipal teaching hospital, a tertiary care hospital in Pokhara, western Nepal, to determine the prescribing frequency of commonly used drugs (10). A total of 530 prescriptions were analysed, and the mean \pm SD drugs per prescription was 2.15 ± 1.71 ; 67.4% of the drugs were prescribed by brand name and only 39.56% of the drugs prescribed were from the WHO essential drug list. The frequency of prescribing of antiulcer drugs, antibiotics, antiasthma drugs, antihypertensive and analgesics was 24.15% (n=128), 23.96% (n=127), 20.56% (n=109), 19.81% (n=105) and 15.09% (n=80), respectively. This study revealed considerable scope for educating prescribers to improve their prescribing practice.

2.3 Use of medicines in Africa

In 2009, a cross-sectional study conducted at the University of Ilorin Teaching Hospital in Nigeria, evaluated the prescription patterns and cost. The findings were that out of the 630 prescriptions that were reviewed, 83.5% of them had at least one antibiotic and only 45.6% of the prescriptions were presented in generic names. The conclusion was that prescribing habits in developing countries were bad as prescribers were not complying with standard treatment guidelines and that a lot of costs were incurred as a result of irrational prescribing (11).

A recent study conducted in Ethiopia a total of 362 prescriptions were reviewed retrospectively from a total of those prescribed for 1-year period (12). The average number of drugs prescribed per encounter was 2.1 with a range between 1 and 5. The percentage of encounters in which an antibiotic or injection was ordered was 58.8% and 3.6%, respectively while the percentage of those drugs prescribed by generic name and from an essential drug list was 98.4% (n=742) and 81% (n=611), respectively. Amoxicillin (9.2%), ciprofloxacin (6.2%), and doxycycline (4.8%) were among the common antibiotics prescribed. This study showed that the prescription pattern for most antibiotics deviates from the one advised by the WHO.

2.4 The practice of prescribing medicines in Somalia

An assessment of drug utilization in Somaliland and Punt-land, carried out in 2001, showed worryingly poor standards of practice, equally shared by private and public prescribers(2). Reportedly, over-prescription of drugs is a commonplace. Self-prescription habits are strong and may account for much drug consumption. An Essential Drugs' List, a National Formulary and Standard Treatment Guidelines have been developed and introduced into the country since 2007, although not followed by public and private health sectors (13).

3 Methodology

3.1 Study site

This study took place in Galkayo city, the capital of Mudug region, Galmudug state lying in central Somalia with an estimated population of 137,667 inhabitants (14). The prescription data were collected in outpatient in a hospital on the southern part of Galkayo (Galkayo South Hospital) with a catchment population of about 45% of galkayo inhabitants. Galkayo city has many private hospitals and different pharmacies where doctors or health workers see patients and treat there, but there is only one public hospital in the south part where majority of the people in the south visit or admitted depending on their condition. Two non-governmental organizations support the hospital with medicine and equipments, so the hospital is free for the public, and that is why majority of galkayo people come for treatments.

Galkayo South Hospital is a multispecialty hospital with an emergency unit, outpatient department and several inpatient wards such as maternal, pediatric and nutrition. At the outpatient departments there are three doctors who work 6 days per a week, 8 hours per day. According to the outpatient data of the hospital, the total numbers of patients who visit at the center are about 150- 200 patients per day, mostly women and children. Those patients are divided into three categories: children, women who are pregnant or lactating and adults, these divisions allow each patient to see an experienced doctor with their conditions.

When patients meet the attending doctors, they usually get their prescribed medicines from the hospital pharmacy free of charge, but due to frequent stock shortages the patients are sometimes sent to the private pharmacies where they can buy the medicines by themselves.

3.2 Study design

The design of the study was the result of many consultations between the researcher and his supervisors both locally and in Sweden. Well before the start of the study, the researcher briefed the hospital leadership and the doctors working at the outpatients where the study to be carried out and their acceptance and support assured. Then ethical clearance was sought as described below. The researcher and supervisors agreed to make the study in two arms:

Arm one: A This research was used a cross-sectional descriptive survey to investigate the drug study where the researcher prescription pattern among the doctors working at the outpatient clinics in the Galkayo south hospital using 4 different indicators: 1) most prescribed therapeutics medicines, 2) percentage of antibiotics prescribed, 3) Percentage of drugs prescribed with generic names, and 4) number of drugs per prescription. It was designed that prescription data to be collected during a pre-planned period of eight days dispersed over a period of two months.

Arm two: In this part of the study a qualitative survey was planned to investigate the knowledge of prescribers on the rational drug prescribing, factors which can influence doctor's behaviour in drug prescribing and the prescriber's knowledge on the WHO standard treatment guidelines using a pre-tested questionnaires consisting of 12 questions.

3.3 Data Collection

3.3.1 Arm one of the study:

According to the outpatient data at the hospital, the total number of patients who visit at the center is about 150- 200 patients per day. With this basic information and assuming that irrational use of medicines is highly prevalent in the area, we calculated that a sample of 1200 to 1400 prescriptions were needed to give a good power to detect any irrational use of drugs in the outpatient clinics. This sample required for the study was estimated to be collected in a total of eight days-period. To avoid any time bias, the eight-days data collection period were dispersed in a two-month period, 2 days per week. During the study days, the researcher was collecting all the prescriptions from that particular day of the week from the pharmacy where patients hand their prescriptions to staff of the pharmacy. After data was collected, each day prescriptions was put in one excel together in order to be easier when the researcher plans to analyze the data, the information took from each prescriptions were; Age, Gender, Diagnosis, Number of drugs prescribed per patients and names of each prescriptions, after data is recorded prescriptions are returned back to the hospital.

3.3.2 Arm two of the study

In the second arm of the study, the researcher has also interviewed the prescribers about the challenges they face, their knowledge and adherence to WHO drug prescription indicators using a questionnaire consisting of 12 questions (see appendix 1). The questions were written in English. The researcher was reading the questions for the prescribers, translating into Somali and was explaining to them when needed. The researcher met each prescriber separately. The researcher was then immediately writing down the answers of the prescribers using their exact words.

3.3.3 Data analyses

Data analysis was conducted between 20th of March to – 20th of April 2018. All data entry and analysis was carried using Microsoft Excel. The crude data which were collected in Excel format were analyzed according to age, diagnosis and research indicators. All diagnosis were grouped into twenty different diseases according to the International Classification of Diseases (ICD-10) (15). Then the frequency of each disease and its percentage in respect to the total number of diseases identified were calculated. All drugs prescribed were classified according to their therapeutic use into six different groups (antibiotics, analgesics, antidiarrheal, vitamins, antihistamines and others). The percentage of each group was then calculated in respect to the total number of prescriptions. Then data collected were analyzed according to the four pre-set indicators. All data is then summarized in tables and graphs. After these analyses was finished the researcher interviewed the doctors that was working the outpatient department of the hospital during the study period, those interviews are summarized in the result section.

3.3.4 Ethical consideration

Ethical approval was obtained from Galkayo University Ethical committee. All procedures regarding the confidentiality of patient documents and clinician details were followed in full. The research results would only be shared with the university authorities and Somali Swedish research group. The patients' records and any other relevant documents were handled as regulated by the hospital authorities as necessary. Confidentiality was assured as no names were captured on the data collection tool, the medical prescriptions were used with trusted individuals and has been returned to the hospital. Physicians willing to participate in the study were requested to sign the consent form.

4 Results

This chapter provides detailed information from the analysis of the data collected from the hospital during the 2 months of the study period. The result will be shown in two parts, in part one the analysis will only be quantitative results including patient characteristics, most diagnosed diseases and prescription details of the patients, and the other part of the result will be qualitative analysis in which we summarize the interview of the doctors that work in the OPD department.

4.1 Quantitative results

4.1.1 Characteristics of patients

Table 1: Characteristics of the patients

Gender	Frequency	Percentage %	children	Patients older than 18 years
Female	844	61	315	529
Male	541	39	202	339
Total	1385	100	517	868

As you can see from the table above, the number of patients who visited the hospital during the study period was 1385 patients, each patient has received one prescription from the visit of the doctor which he would go to the pharmacy to collect the medicine. Of the 1385 patients, 844 (61%) of the patients were Female with the age between 3 months to 75 years old, and 541 (39%) were Male between the age of 4 months to 79 years old. 517 (37.3%) of the patients who received prescriptions were children, in which 315 (70%) of the children were Female and their age was less than 18 years old, the remaining 202 (30%) were Male less than 18 years old. Most of these children were accompanied by their mothers, fathers or someone who could take their responsibility and could control the dosage of their drugs.

4.1.2 Most diagnosed diseases in the Out-patient department.

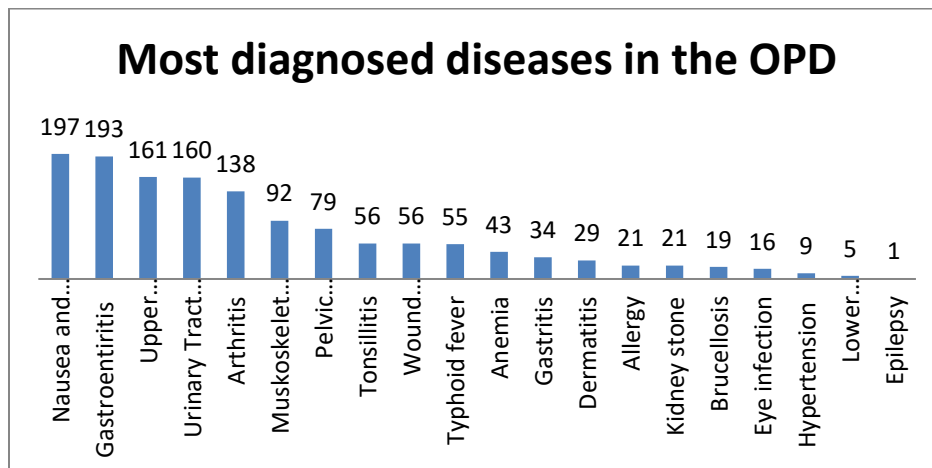


Figure 1: Most diagnosed diseases in the out-patient department.

From the Graph above, The number of patients under the study were 1385 participants, the most diagnosed disease in the out-patient department of the hospital was Nausea and vomiting in pregnancy with frequency of 197 (14.2 %), Gastroenteritis was second most diagnosed disease with frequency of 13.9% mostly were children, other mentionable diagnoses were Urinary tract infection and Upper respiratory tract infection both with frequency of 11.6%. Hypertension, Epilepsy and Lower respiratory tract were the least diagnosed diseases in the outpatient department all with frequency less than 1%.

4.1.3 Most Prescribed drugs in groups

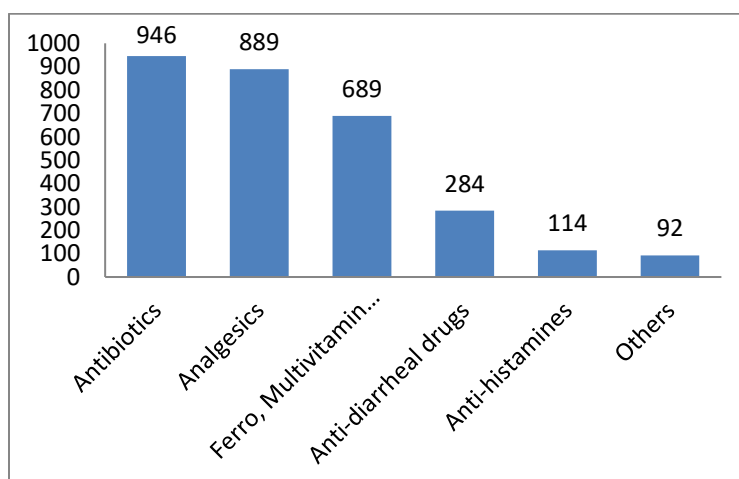


Figure 2: Most prescribed drugs put together in groups

As you can see from figure 2, during the research 3014 drugs were prescribed, of the 3014 drugs 946 (31.2%) drugs were Antibiotics prescribed for patients with different infectious diseases, 889 (29.5%) were analgesics with Paracetamol being the most prescribed drug in this category. Ferro-folic, Multivitamin and Malax (Maalox drug) were also prescribed drugs with frequency of 689 (22.9%) mostly of this category if not all were given pregnant women complaining of nausea and vomiting. Anti-diarrheal and Anti-histamines were also prescribed in significant number with frequency of 284(9.4%) and 114(3.7%) respectively. The last Category is Others which 3014 drugs prescribed 92 (3.1%) of the drugs were given, in this category drugs included are Antihypersentives and anti-diabetic drugs with frequency of less 1%, Omeprazole with frequency of 1.1% and other drugs such carbamazepine, Hydrocortisone and Whitefield creams.

4.1.4 Antibiotics prescribed in the outpatient department

As mentioned figure 3, of the 3014 prescribed drugs 946 of them were antibiotics. Most prescribed antibiotic by was Amoxicillin with frequency of 428 (45%) of the antibiotics may be because was , the reasons prescribed mostly was pregnant women with some kind infection and children with Upper respiratory tract Gastrointestinal infections. The second most prescribed antibiotics were Metronidazole with frequency of 137 (14%), Most of these drugs were given children with Gastrointestinal diseases, with small percentage of Metronidazole was given women with Pelvic Inflammatory Disease.

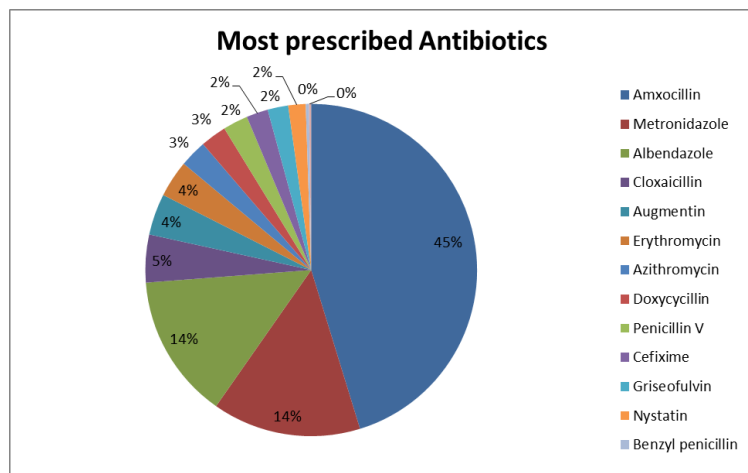


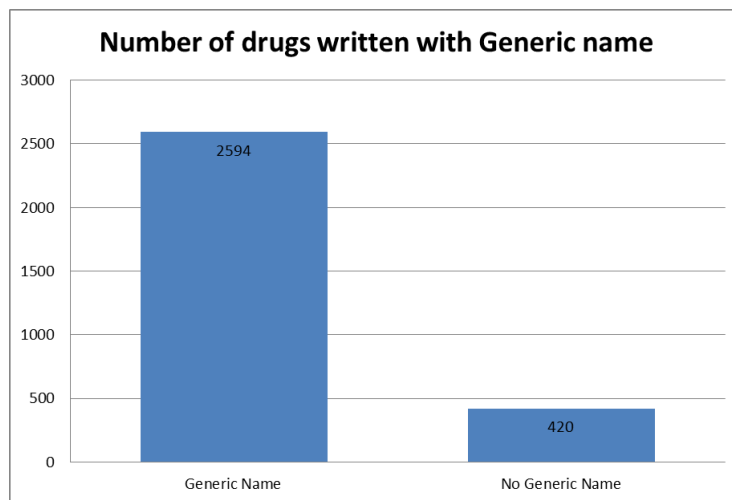
Figure 3; Most prescribed Antibiotics in the 2 months of the research.

Cloxacillin and Augmentin (Amoxicillin-clavulanate) were also among the prescribed drugs with frequency of 44 (5%) and 38 (4%) times respectively and reasons being Wound infection and Upper respiratory tract infections. Other antibiotics such as Erythromycin, Azithromycin, and Penicillin V were mostly prescribed for patients with Tonsillitis, Upper respiratory tract infections and Gastrointestinal infections. Cefixime were given pregnant women with Urinary tract infections and Typhoid fever patients.

The least prescribed drug was Benzyl Penicillin with frequency 4 times (less than 1%) of the drugs, the reason given these patients were mostly severe Tonsolitis and one case of Syphilis.

4.1.5 Percentage of drugs prescribed written with generic name

Of the total of 3014 drugs, 2594 medicines (86%) were prescribed by their generic names (see figure 4).



4.1.6 Number of drugs per prescriptions (polypharmacy)

Figure 5 shows the number of prescriptions containing only one drug, two drugs, 3 drugs, and 4 or more drugs. Drugs written per patient in the total of 2 months, the total prescription was 1385, 1177(85%) of those prescriptions prescribed were written with three or less drugs per patient, 118 (9%) of the prescriptions were written with four drugs for each patient, and 90 (6%) of the prescriptions were written with 5 or more drugs for each patient.

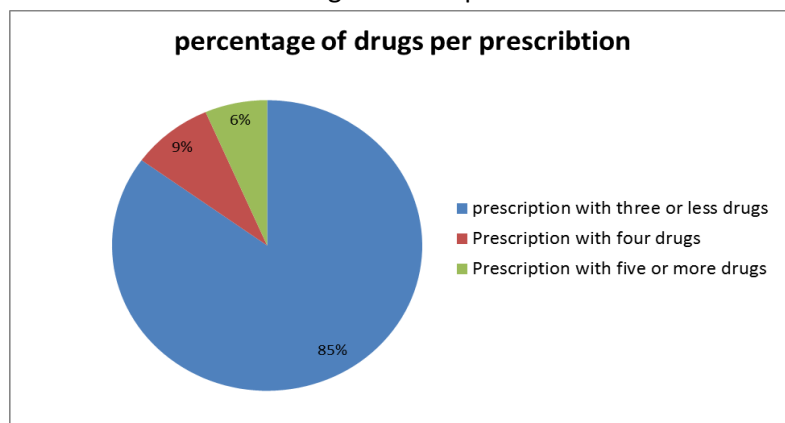


Figure 5: Number of drugs written per prescriptions.

4.2 Qualitative results

The only three doctors who are working in the outpatient department of Galkayo South Hospital, we interviewed face to face using structured questionnaire. The questionnaire contained 12 questions covering different aspects of rational use of drugs and the doctor's knowledge on the subject (see appendix 1).. The researcher interviewed each doctor separately. This is a summary of their replies to the 12 questions:

All the three doctors reported that each and every one of them possess copies of formulary and treatment guidelines prepared by Doctors Without Borders which was confirmed by the researcher by checking the availability of the manuals in the doctor's offices., When asked if they use internet to search for information about drugs, two have reported that they use websites such as Drug.com and Webmd.com to gather more information about drugs, the other doctor mentioned that he uses mostly books and discusses with other doctors about new drugs in the market. None of the doctors attended a training or seminar on rational use of drugs. When asked about prescription rules set by the WHO, two of the doctors have said they know those rules and adhere to most of the time. The third doctor said he doesn't know those rules set by the WHO but would read more about them in the future. The doctors reported that they are well aware that the hospital management uses an international list of drugs prepared by the set by Doctors without Borders. The three doctors that work in the outpatient department have acknowledged that there is some degree of irrational use of medicine in the city, mostly due to patients exaggerating their symptoms, poor patient compliance causing frequent relapses of the disease high patient load, lack of proper diagnostic laboratories which do not give sufficient time to the doctors to spend with the patients, allow the doctors to properly diagnose the patients ailments, think carefully about what they are prescribing or reflect afterwards about their work. Most of the doctors interviewed have suggested to worker harder to educate their patients about the dangers of antibiotics and ask for more seminars and training seminars about the rational use of antibiotics, and the dangers of polypharmacy as well as antibiotic resistance.

5 Discussion

The aim of this study was to assess the drug prescription pattern at the Out-patient clinics of Galkayo South Hospital using WHO drug prescribing indicators (3). The study consisted of two parts, a quantitative cross-sectional survey and a qualitative part. In the first arm of the study, we collected all prescriptions issued at the hospital outpatient during an eight-day spread over two month's period. In the qualitative part of the study, we interviewed the three doctors working at the outpatient using structured questionnaire. To our knowledge, this is the first study of its kind in the area. During the study 1385 patients visited the Outpatient of the hospital of which 75% was women and children between the ages of 4 months to 79 years. The most diagnosed disease in the study period was nausea and vomiting during pregnancy with a frequency of 14.2%. The second and third most diagnosed diseases were gastroenteritis and upper respiratory tract infection with frequencies of 13.9% and 11.6% respectively. In Somalia mother and infant mortality are among the highest in the world (16).

The over representation of these two groups in our sample only confirms that pregnant women and small children are the most weak and vulnerable groups in our societies. Other clinical problems presented by the group were Urinary tract infections, Arthritis, Musculoskeletal pain and Pelvic inflammatory disease with total frequency of less than 40 %. 11.6%, 10%, 6.6% and 5.7% respectively. Other diagnosis with lesser frequencies was Typhoid fever (4 %) and Brucellosis (1.4 %). There are no previous studies to compare these findings, but typhoid and brucellosis are frequently diagnosed in private clinical laboratories although the quality of those laboratories has been questioned (personal observation). The least diagnosed diseases in the study sample were Epilepsy (0.1%) and Hypertension (0.6%). The 0.1 % frequency of epilepsy among the study is similar to previous reports in resource-poor countries (17). The low frequency of hypertension in this sample only confirms also that non-communicable diseases such as hypertension and diabetes are still low as compared to communicable diseases such as diarrhea and upper respiratory infections. Regarding the drug prescription indicators, this study shows a general picture that drugs are prescribed irrationally and that the knowledge of prescribers about the concept of rational use of drugs is poor which is also consistent with reports from other resource-poor countries. In our study, the average number of drugs per prescription was 2.2 which is much higher than that recommended by the WHO which is 1.6-1.8. Besides the poor prescriber knowledge, the other reasons behind the polypharmacy reported by the doctors interviewed were patient pressure, and lack of the availability of first choice drugs. A drug survey done in 12 countries in Africa have shown that the average number of drug per prescription was as much as 3.4 in Nigeria and as low as 1.3 in Zimbabwe (18). Despite the fact that there is no properly functioning government in Somalia and that most institutions including health care system is still poorly regulated and controlled, it is interesting that our findings lie within the range of the above studies from other well-functioning countries in respect to Somalia.

In this study it is also found that a high number of patients were prescribed with antibiotics. Out of the 1385 patients visited in the outpatient, 813 (58.7%) were prescribed with antibiotics which is very high compared to WHO standard (20-26.8%). However, a national baseline study on

drug use indicators in Ethiopia in September 2002 also showed that the percentage of encounters in which an antibiotic was prescribed was 58.1%, which is similar to our findings (19). In the drug use pattern study in 12 developing countries, the percentage of encounters in which an antibiotic was prescribed was high in Sudan (63%), Uganda (56%), and Nigeria (48%) and relatively better in Zimbabwe (29%) (18).

The percentage of drugs prescribed by their generic name at the Outpatient of Galkayo South Hospital was 86% a little lower than the recommended standard by the WHO which is 100%. Most drugs written without their generic name was Malax (Aluminum hydroxide) and Daonil (Glibenclamide). The number of drugs written without generic name was low but most prescriptions that the drug Malax is written was so much that made the percentage of drugs written with generic name lower. This is small problem compared to inappropriate use of antibiotics and prescribing more than 3 drugs to one patient. In the study of 12 developing countries, the percentage of generic drugs prescribed was between 58 % to (94%) (18). which is in agreement within our findings.

The percentage of drugs prescribed from essential drug list at Galkayo Hospital in the study period was 100% which is similar to the standard of WHO (100%), Almost all the drugs used in the hospital are from the essential drug list, this is similar to other studies done in Ethiopia and across Africa. A national baseline study on drug use indicators in Ethiopia in September 2002 showed that the percentage of drugs prescribed from the essential drug list to be 99% In a study of prescription patterns from 12 developing countries, the percentage of drugs prescribed from their national essential drug lists (18) were close to the results of our study. Regarding the use of injection, there was no prescription carrying an injection in our sample of prescriptions. This is difficult to assess but can only be attributed to the fact that the three doctors were prescribing from the hospital essential drug list. We cannot exclude out also bias in the study since the three knew about the study and in that case they restricted their use of injections, In the interview with the three doctors working at the outpatients, they admitted that injections are commonly prescribed and often asked by the patients in their believe that injections are better than oral medications.

Most of drugs prescribed in Galkayo hospital during the study period were antibiotics and analgesics with frequency of 60%, This is worrying since these type of drugs can lead to drug resistance and addiction particularly opioid based analgesics.

Most influencing factor of prescribing pattern was availability of the drug, where laboratory shortage and high number of patients per physician also contributed to the irrational use of prescriptions. Patients visiting multiple times just so they could get the medicine they desire and exaggerate simple conditions just to get antibiotics were also factors influenced the pattern of prescriptions by physicians

5.1 Conclusion

This is the first study of this kind in the area and probably in the whole of Somalia since we could not identify similar study in our extensive literature search. The findings shed light to the existence of some irrational use of medicines in the area particularly polypharmacy and the overuse of antibiotics as well poor knowledge of prescribers on the proper use of medicines. Our

study will hopefully stimulate further similar studies in the area and will encourage local health authorities to focus educating drug prescribers and the public about the rational use of drugs.

This study was limited in its scope and time span. It was conducted in one hospital in Galkayo town Somalia where only three doctors operate in the out-patient of the hospital. The study period was also limited to 8 days spread over only 3 month's period. Thus its results should be interpreted with caution and in consideration of the above factors..

6 References

- 1) World Health Organization, Promoting Rational Use of Medicines: Core Components - WHO Policy Perspectives on Medicines, No. 005, September 2002.
- 2) World Health Organization, Health Systems Profile- Somalia; Regional Health Systems Observatory- EMRO 2006.
- 3) World Health Organization, How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators -(1993; 92 pages).
- 4) Stephanie Fletcher-Lartey, Melissa Yee, and Rabia Khan Why do general practitioners prescribe antibiotics for upper respiratory tract infections to meet patient expectations BMJ Open. 2016.
- 5) Jakob Holstiege and Edeltraut Garb s; Systemic antibiotic use among children and adolescents in Germany, European Journal of Pediatrics, 2013.
- 6) Kenealy T1, and Arroll B, Antibiotics for the common cold and acute purulent rhinitis, Cochrane Database of Systematic Reviews, 2013.
- 7) Ferech M1, Coenen S, Malhotra-Kumar S, and Dvorakova K, European Surveillance of Antimicrobial Consumption (ESAC), journal of antimicrobial chemotherapy, 2006.
- 8) Nurhan Meydan Acimis1, and Ayse Canan Yazici2; the Prevalence of Prescribing Antibiotics by Primary Health Care Physicians in Turkey: professional medical publications 2009.
- 9) Chanin Chareonkul, Va Luong Khun and Chaweewon Boonshuyar: study of three pilot health centers in Kampong Thom Province. Rural Health Training and Research Center June 2002.
- 10) Ravi Shankar P , Partha P , and Nagesh S; Prescribing patterns in medical outpatients, International Journal of Clinical Practice, 2002.
- 11) Jimmy M. Hangoma, antibiotic prescribing patterns among physicians at the university teaching hospital in Lusaka, Zambia. The University of Zambia Lusaka, 2014.
- 12) Muluken Wubetu, Tafere Mulaw, and Getachew Hailu; Assessment of Drug Prescription Pattern in Two District Hospitals, Northwest Ethiopia, Journal of Health Education Research & Development, 2018.
- 13) Health Systems Profile- Somalia; Regional Health Systems Observatory- EMRO 2006.
- 14) Galkayo city, Wikipedia, 29 November 2018.
- 15) World Health Organization, ICD-10 classification of mental and behavior disorders, WHO, 1993
- 16) World Health Organization, country statistics profile. Eastern Mediterranean Region, 2017.
- 17) J W Sander and S D Shorvon. Epidemiology of the epilepsies. J Neurol Neurosurg Psychiatry. 1997 June; 62(6): 679.
- 18) Ministry of Health Zimbabwe, Essential Drugs Action Programme . How to investigate drug use in health facilities. Geneva: Essential Drugs Survey. WHO; 1993
- 19) World Health Organization, Assessment of the Pharmaceutical Sector in Ethiopia, WHO, Addis Ababa; 2003.

7 Appendix

Interview with drug prescribers

1) Do you have a drug formulary in your office? Can you show me?

2) Do you have a treatment guideline in your office? Can you show me?

3) Where do you get information about drugs if not above books?

4) If you use the internet for your source of drug information, which are your favourite sites?

5) Did you attend a course/seminar on medicines during the past 2 years? If yes, give details?

6) Do you know about WHO essential medicine (EM)? Yes/No?

7) What are the core principles of WHO EM?

8) Do you practice EM principles in your clinical practice?

9) Does the facility/hospital your work has a local essential drugs list (EDL)?

10) Do you think irrational use of medicines is a problem in your area? if yes, why?

11) What do you think are the causes of irrational use of antibiotics?

12) How to improve this irrational use of antibiotics problem? Or over prescription of antibiotics?
