

**SPECTRUM OF SKIN DISEASES AND DRUG PRESCRIBING
PATTERN AMONG OUT PATIENTS IN PUBLIC AND FAITH
BASED HOSPITALS IN THREE REGIONS OF
TANZANIA**

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**MSc. (Pharmaceutical Management) Dissertation
Muhimbili University of Health and Allied Sciences
October, 2015**

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AMONG OUT PATIENTS IN PUBLIC AND FAITH BASED HOSPITALS IN
THREE REGIONS OF TANZANIA**

By

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**A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the
Degree of MSc in Pharmaceutical Management of Muhimbili University of Health
and Allied Sciences**

**Muhimbili University of Health and Allied Sciences
October, 2015**

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled “*Spectrum of Skin Diseases and Drug Prescribing Pattern Among Out patients in Public and Faith Based Hospitals in Three Regions of Tanzania*” in fulfillment of the requirements for the MSc Degree (Pharmaceutical Management) of Muhimbili University of Health and Allied Sciences.

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DECLARATION

I, **Deo**ratias **Rweyemamu**, declare that this Dissertation is my own original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

Signature _____

Date _____

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ABSTRACT

Background: Skin diseases account for a higher proportion of outpatient attendances especially for children under five years in Tanzania. In some studies, skin diseases have shown to be among the top ten diseases of hospital admissions. Inappropriate prescription and use of medicines is an extremely serious global problem that waste resources, may be harmful to patients and lead to development of antimicrobial resistance. Prescribing patterns studies and data of spectrum of skin diseases are used in interventions to improve use of medicines, informed decision making and health planning.

Objectives: The study aimed at investigating the spectrum of skin diseases and drug prescribing pattern among out patients in public and faith based hospitals in three regions of Tanzania.

Methodology: This was both a cross sectional retrospective and prospective study conducted between January to December 2014. The Spectrum of Skin diseases and the data for prescribing indicators were collected retrospectively from medical records of 5 health facilities using WHO-Simple Prescribing Indicator Forms. The Prospective study involved use of structured questionnaires to collect data from 43 OPD prescribers on availability and utilization of Standard Treatment Guidelines (STG). Study sample of 1020 prescribing encounters were obtained through random sampling from 4520 medical records of skin diseases. Data was analyzed using the ‘Statistical Package for Social Sciences’ (SPSS) program version 20.0.

Results: A total of 2151 drugs were prescribed for the 1020 prescriptions obtained from the health facilities, giving a range of 1.9 – 2.5 average number of drugs per encounter with a mean of 2.11 (SD 0.64). Medicines prescribed by generic name constituted 75% (SD 7.2%) of the total prescribed medicines. Antibiotics and injections were encountered by 38 % and 5.0% respectively. Eighty one to ninety percent (81%-90%) of the prescribed medicines with a mean of 85% (SD 3.7%) were from EML. About 72% (31/43) of prescribers reported to consult STGs, only 65% (28/43) of them had copies of STGs in their working rooms. The study established that 68.7 % of the patients were treated according to STGs in both public and faith based health facilities. The skin diseases

observed included noninfectious dermatoses (63.8%) and infectious dermatoses (36.2%) of which included dermatitis variants 40%, pyoderma 19% and superficial mycosis 12%.

Conclusions and Recommendations.

Overall the prescribing practices were agreeable with WHO recommendations for 4 indicators which were average number of drugs per prescription, prescribing from EML, percent of encounter with injections and key drugs in stocks. However, 3 indicators were not in accordance with the WHO guidelines and they included percent encounter with antibiotics, generic prescribing and percent availability of STGs among prescribers. From this study it is recommended that rational prescribing of antibiotics and generics should be provided to both public and faith based prescribers. Also an intervention is necessary to enhance accessibility of STG by improving their distribution to various health facilities. All this will in turn improve management of the prevailing skin diseases.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CPM	Center for Pharmaceutical Management
DAP	Drug Action Program
DCPA	Dermatitis Cruris Pustolosa Atrophicans
EML	Essential Medicines List
FDCs	Fixed Dose Combinations
FBHF	Faith Based Health Facilities
GOPD	General Outpatient Department
HMIS	Health Management Information System
HMTC	Hospital Medicines and Therapeutic Committee
HIV	Human Immune Deficiency Virus
INRUD	International Network for Rational use of Drugs
IRB	Institutional Review Board
MSD	Medical Stores Department
MSH	Management of Science for Health
MTC	Medicines and Therapeutic Committee
NIMR	National Institute of Medical Research
OTC	Over the Counter
OPD	Outpatient Department
MOHSW	Ministry of Health and Social Welfare
RUM	Rational Use of Medicines
MUHAS	Muhimbili University of Health and Allied Sciences
STG	Standards Treatment Guidelines
SPSS	Statistical Package of Social Sciences
UK	United Kingdom
UNICEF	United Nations Children's Fund
WHO	World Health Organizations

Definitions of Terms

- **Rational use of medicines:** Refers to a condition where by patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for adequate period of time and at the lowest cost to them and their community.
- **Dermatological Disorders:** Are various common skin diseases ranging from bacterial skin infections, virus and fungal skin infections, allergic skins and parasitic skin infestations (scabies and pediculosis)
- **Medicines Therapeutic Committee (MTC):** A Medicines and therapeutics committee (MTC) in district and regional hospital, which is also known as therapeutics committee, is a committee designated to ensure safe and effective use of medicines in the facility or area under its jurisdiction. MTC activities involve different cadres of health professional, who have different experiences, beliefs, skills, practices, motivations and status.
- **Pyoderma:** the generic term used to describe any variant of superficial bacterial skin infection (e.g. impetigo, impetigo contagiosa, ecthyma, folliculitis, “impetigo of Bockhart”, furuncle, carbuncle, tropical ulcer, etc.);
- **Standard treatment guidelines (STG):** Clinical guidelines consisting of systematically developed statements to help prescribers make decisions about appropriate treatments for specific clinical conditions. Evidence-based clinical guidelines are critical to promoting rational use of medicines. They provide a benchmark of satisfactory diagnosis and treatment against which comparison of actual treatments can be made.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

In the developing world, skin disorders constitute approximately one half of all diseases encountered and can affect more than 60% of general population. They appear to dominate patterns of illness at village or community level particularly in resource-poor areas. Skin diseases have serious impacts on people's quality of life such that they may be burden to the nations (1). Various types of diseases affect the skin, but they differ depending on age, geographical region, climate and socioeconomic status. Many skin diseases are curable or controllable. However, it is recognized that factors such as poor housing, inadequate nutrition, unsanitary conditions and environmental pollution may contribute to prevalence of a disease (2).

In Tanzania there is a number of people suffering from common skin problems manifesting as primary and secondary cutaneous complaints. They are found among children, adults as well as in old persons. The common skin problems are scabies, bacterial skin infection, superficial mycosis and viral skin infection (3). Poor treatment exacerbates the problem because it fails to alleviate the disease. It has a wider impact on continuing ill-health, as well as affecting local micro-economics through erosion of household budgets.

Studies on drug prescribing patterns rely on WHO/INRUD prescribing indicators as sufficient for making intervention on drug use improvement. These indicators define the problem of drug use pattern and identify areas for intervention. Irrational prescribing of drugs is of common occurrence in clinical practice (4). Most common and important reasons are lack of knowledge about drugs, unethical drug promotions and irrational prescribing habits among the clinicians. The prescribing behavior of the doctor depends upon the input from various sources like patients, academic literatures, professional colleagues, commercial publicity and government regulations. Various prescribing errors are caused by ineffective use of these inputs and are very common in clinical practices. Studies on prescribing pattern and data on skin diseases spectrum are important in making

informed decision for channeling resources and setting priorities in health planning. Prescribing data are also used to devise and implement interventions for improving rational drugs use (5).

1.1.1 Medicines used in dermatological practice

Dermatological infections are categorized as primary and secondary infections in order to target successful therapy (6). The categories of medicines that are primarily used in dermatological diseases are vitamins, minerals, antibiotics, antiseptics, antifungal drugs, antiviral drugs, antihistamines, local anesthetics, emollients, keratolytics, antiparasitic and topical corticosteroids. Most skin diseases are chronic and require lifetime treatment. Upon proper diagnosis and treatment, the management of skin diseases often results in great improvement and satisfaction to the patient. The treatment required generally to be cheaper and locally available (7). Evaluation of the type of medicines to be prescribed and identification of part of the body is necessary before embarking on the treatment. Certain treatments may have adverse effects causing hypopigmentation (a lightening of the pigment of the skin) or hyperpigmentation. For example, hypopigmentation can be caused by steroid injections, and the use of psoralens and estrogens can result in hyperpigmentation. Both are highly noticeable on dark skin and this can have detrimental effects on the patient (8).

1.1.2 Healthcare system in Tanzania

Health care service delivery in Tanzania is provided through a decentralized pyramidal pattern of a referral system from community health services to consultant hospitals. All these levels offer curative, preventive and promotive services. The services are provided by both public and private health facilities, public facilities being the majority accounts for 64% of all health facilities (9). Primary Health Care services form the basement of the pyramidal structure of health care services with a number of dispensaries, health centers and one District hospital at the district level. Approximately 87% of all health facilities in Tanzania are dispensaries. As of 2012, the health facilities for both public and private included 5,680 dispensaries, 742 health centers and 241 hospitals (10).

The hierarchy of conventional medical facilities that provide clinical and preventive services to Mainland Tanzanians is described below, in Figure 1.



Figure 1: Hierarchy of health services provided in Mainland Tanzania.

Source: United Republic of Tanzania, Ministry of Health (11).

1.1.3. Situation of Skin diseases in Tanzania

The available data suggest that in Tanzania skin disease is among the top ten diseases of hospital admissions in 2009 and 2010 among children with less than five years of age. The diseases were preceded by malaria, pneumonia and diarrhea. Moreover, the diseases were among the top ten diseases conditions for the outpatient's attendances ranking 6 in the list in 2009, 7 in 2010 and 2011. Table 1 indicates the position of skin disease in relation to other diseases among outpatient attendances (12).

Table 1: Top ten outpatient diagnosis among under-fives: HMIS 2009 – 2011

Rank	2009		2010		2011	
	Diagnosis	% of diagnosis	Diagnosis	% of diagnosis	Diagnosis	% of diagnosis
1	Malaria	38.2	Malaria	34.8	Malaria	33
2	ARI	17.4	ARI	17.4	ARI	18.5
3	Pneumonia	7.3	Pneumonia	9.0	Pneumonia	9.5
4	Diarrhea	6.9	Diarrhea	8.0	Diarrhea	9.2
5	Intestinal worms	4.7	Intestinal worms	3.7	Intestine worms	4.8
6	Skin Diseases	2.9	Urinary tract Infection	3.4	UTI	3.2
7	Eye diseases	2.9	Skin diseases	3.0	Skin diseases	3.0
8	Urinary tract inf.	2.4	Eye Infection	2.4	Eye infection	2.6
9	Anemia	1.6	Anemia	1.6	ILL defined illness	2.0
10	Ill-defined illness	1.6	ILL Defined Symptoms	1.3	Anemia	1.7

Source: HMIS data for Mainland Tanzania, 2009, 2010, 2011

Dermatological disorders were identified by the National Institute for Medical research (NIMR) among 10 priority areas for disease focused research in 1999. In 2006 – 2010, the Institute used the stipulated criteria for setting priorities for National health research that aimed to optimize utilization of scarce resources available for research. The following diseases were identified and the arrangement was in the order of research sensitivity; Malaria, upper respiratory tract infections, diarrhea, pneumonia ,intestinal worms, eye infections, skin infections ,sexually transmitted diseases, anemia ,trauma and accidents (13).

1.1.4 Challenges towards improvement of medicines use

Many countries have undertaken small scale and large scale interventions to improve the situation of drug use. However, they face number of challenges such as human resource constraints in primary health care, poor access to essential medicines, flawed procurement process, poor distribution mechanisms and unethical prescribing practices (14). Lack of

well-organized drug regulatory authority, presence of large number of drugs in the market and the lucrative methods of promotion of drugs employed by pharmaceutical industries play a great role in complicating the problems. This ultimately leads to poor patient outcomes and significant wastage of scarce resources (15).

With the aid of UNICEF/DAP, Tanzania adopted the World Health Organization approach in 1983 on the rational use of drugs aimed at promoting rational prescription through a multi-pronged strategy, such as adoption of essential medicine list, development of standard treatment guidelines, determination and restriction of irrational prescribing through use of Medicines and Therapeutic Committee (16). Since the initiation of the program, the country has experienced improvements in availability of essential medicines that resulted to better use of medicines through rational prescribing. The field test study for rational use of medicines in 12 developing countries has shown much improvement in the percentage of generic medicines prescribed, in Tanzania by (82%) and Zimbabwe (94%) while the lowest were Nigeria (58%) and 63% of Sudan (17).

1.1.5 Steps taken to improve Prescribing Practices

Inappropriate use of medicines in various disease conditions including dermatology, poses a major challenge in health care system as it can waste scarce resource, reduce therapeutic outcome and lead to development of drug resistance (18). To improve the rational use of medicines, multi-strategies have been adopted in many of developing countries involving combination of educational and managerial components. Drug use evaluation and indicator studies have also been widely used (19).

1.1.5.1 The Hospital Medicines and therapeutic committee

The clinical consequences and economics costs of medication misuse are a challenge for the healthcare system. Preventable medication errors occur in hospitals each year resulting in an addition of billions in healthcare costs. The impact of the Medicines and Therapeutics Committee on hospital care is significant through effect on medication therapy (20). WHO advised every country to form District Hospital Medicines and Therapeutic Committees (MTC), which is a body designated to ensure safe and effective use of medicines in the facility or area under its jurisdiction. Such committees are well-

established in industrial countries as a successful way of promoting more rational, cost-effective use of medicines in hospitals. Governments may encourage hospitals to have MTCs by making it an accreditation requirement to various professional societies (21).

1.1.5.2 Educational intervention

Educational interventions to change prescribing practices target the prescribers. Many studies have been done to document drug use patterns. They indicate that over prescribing, multi-drug prescribing, misuse of drugs, use of unnecessary expensive drugs and overuse of antibiotics and injections are the most common problems of irrational use of drugs by prescribers as well as consumers (22). An intervention trial in India on the “effect of patient education and standard treatment guidelines on asthma control” showed improvement in medication adherence and asthma control (23). In influencing physician prescribing habits, a combination of strategies are likely to be the most effective. These include the provision of interactive opportunities for physicians to be involved in developing and experiencing the new therapeutic approach (19).

Multi-faceted interventions, involving both educational and managerial component, are more effective than those employing only one strategy (19). Whichever approach is used, interventions should focus on specific problem behavior and should target the prescriber, dispensers, facility or public depending on where the assessment indicates the problem lie. Figure 2 shows a framework for improving the use of medicines:

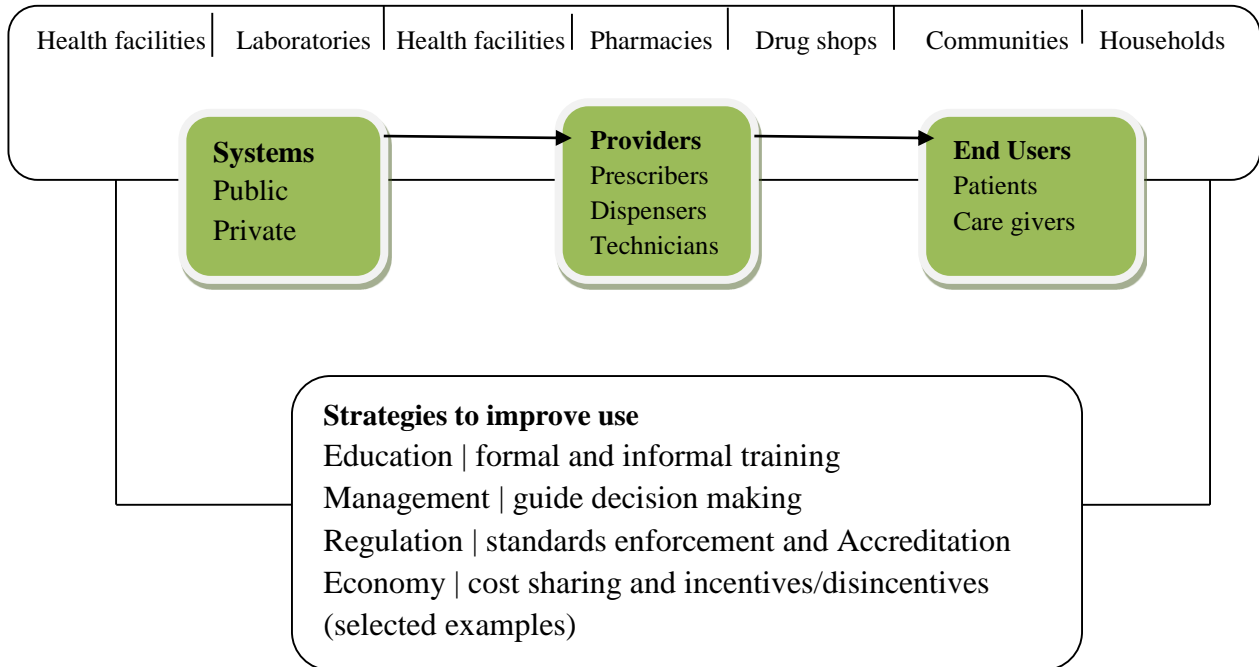


Figure 2: Frame work for improvement of medicine use

Source: CPM/MSH 2011.

1.1.5.3 Assessing medicines use using WHO/INRUD quantitative indicators

Assessment of drug use patterns in health facilities with the WHO drug use indicators is becoming increasingly necessary in order to promote rationality in the use of drugs in developing countries. WHO in collaboration with the International Network for the Rational Use of Drug (INRUD) developed core indicators for assessing medicines use. The indicators were developed to be used as a measure of performance in three general areas related to rational use in primary care.

- Pharmaceutical prescribing practices by health providers
- Key elements of patient care, covering clinical consultations and medicines dispensing
- Availability of facility specific factors which include support of rational use, such as key essential drugs and minimum pharmaceutical information (24).

The indicators are also used to define a limited number of objective measures that can describe the drug use situation in a country, region or individual health facility. Such

measures, or indicators, will allow health planners, managers and researchers to make basic comparisons between situations in different areas or at different times. In the current study the prescribing indicator was applied to explore on the prescribing pattern in dermatology in hospital setting in order to analyze their rationality. This will increase therapeutic efficacy through giving feedback to prescribers. The study employed the following medicines use indicators to measure the aspects of outpatient treatment (19).

1.1.5.3.1 WHO/INRUD prescribing indicators.

The prescribing practices measure the performance of health care providers in several key dimensions related to the appropriate use of drugs.

1. Average number of medicines prescribed per patient encounter
2. Percentage of medicines prescribed by generic name
3. Percentage of encounters with an antibiotic prescribed
4. Percentage of encounters with an injection prescribed
5. Percentage of medicines prescribed from an EML or formulary

1.1.5.3.2 Facility indicators

These represent the features of the working environment that measures the ability to prescribe drug rationally.

1. Availability of clinical guidelines and essential medicines list (EML)
2. Percentage of key medicines available in a facility

1.2 Statement of the Problem

Dermatological diseases are common problems in developing countries especially in sub-Saharan Africa. Several community based prevalence studies report that skin disease prevalence range from 21% to 85% in the region (9). In Tanzania there are numbers of people suffering from common skin problems. They are found in children, youth and adults as well as in old persons. The common skin problems are pyoderma, acne, scabies and superficial mycoses (25). Two studies in Tanzania reported that prevalence of skin diseases ranged between 34.7% and 57.3% respectively (26, 27).

Irrational prescription of medicines is a common occurrence in clinical practices, worldwide more than 50% of all medicines are prescribed or dispensed inappropriately. Inappropriate use of medicines can reduce therapeutic outcome, cause wastage of scarce economic resource and lead to development of drug resistance (18).

Tanzania adopted the WHO approach in 1991 on the rational use of medicines, through multi-pronged strategy such as adoption of essential drug list and development of standard treatment guidelines. Although there are some improvement in the availability of essential medicines that could results in the better use of medicines, there is evidence of poor prescribing of drugs which is manifested by the higher number of drug per prescriptions, high use of injectable formulations and antibiotics (28).

Data on spectrum of skin disease and prescribing pattern in dermatology are scarce. Lack of adequate and qualified prescribers especially in rural health settings can attribute to improper diagnosis and prescribing, only 35% of the required personnel are in place to provide health services (29). Few dermatologists do exist; dispensaries and health centers are managed by clinical officers and nurses who have limited training in dermatology. District and regional level health facilities have improved availability of qualified prescribers.

These prescribers diagnose various skin disorders and prescribe wide range of medicines to treat them, therefore it was necessary to determine spectrum of skin diseases and medicines prescribed to treat them, in order to determine if it is accordance with the Tanzania Standard Treatment Guidelines and WHO/INRUD drug use standards.

1.3 Conceptual Framework

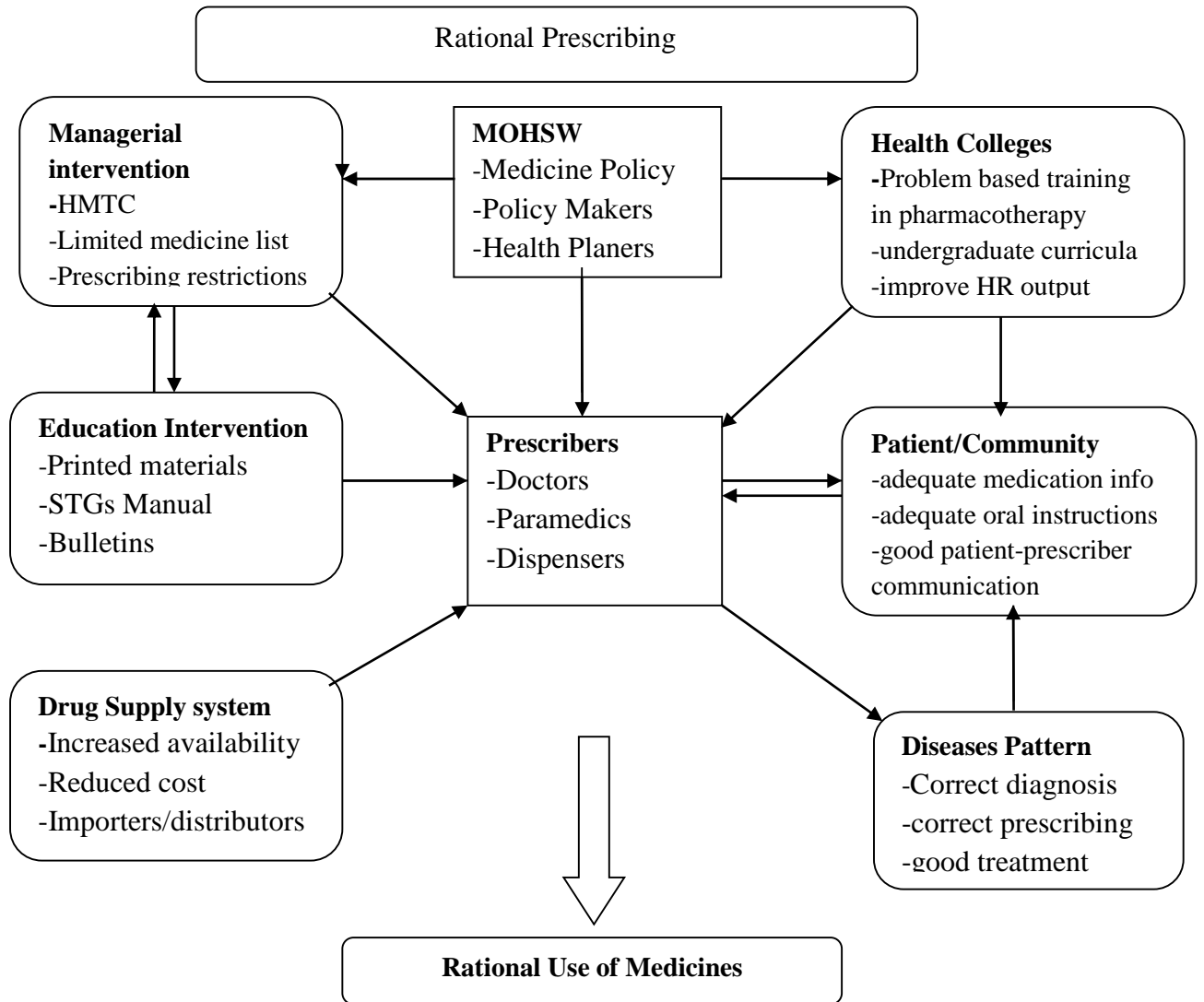


Figure 3: Improving Prescribing, a conceptual framework

Framework overview of parts involved in improving prescribing pattern:

- ✓ MOHSW
- ✓ Patient and community
- ✓ Educational and managerial interventions
- ✓ Drug supply system
- ✓ Common diseases
- ✓ Health colleges/university

1.3.1 Conceptual Model for improving prescribing in Tanzania

Inappropriate prescribing is manifestation of irrational use of medicine that occurs when medicines are not prescribed in accordance with the guidelines based on scientific evidence. Improving prescribing practices is a multifaceted process. Rational prescribing begins with prescribers who may be medical doctor, paramedical or nurses, as shown in figure 3. The prescribing behavior of the doctor depends upon the input from various sources like patients, academic literatures, professional colleagues, commercial publicity and government regulations. MOHSW is the key player to organize and undertake educational and managerial interventional on RUM program. Printed materials like STGs and medicines bulletin are used to impart knowledge and create awareness aiming at changing prescribing habits. Hospital medicines therapeutic committees has main responsibility of approval of medicines that includes hospital drug related policies, rational use of medicines and cost containment. The function of MTC is further extended towards ensuring patient safety, promoting evidence based medicines, formulary management and conducting continuing education.

1.4 Rationale of the Study

In Tanzania skin diseases account for a higher proportional of outpatient attendances whereas few dermatologists are available in hospitals to manage and prescribes for skin diseases. In dispensaries and health centers skin diseases are managed by clinical officers and nurses who have limited training in dermatology. With the few dermatologists available in health care delivery system there is likeness that prescribing in dermatology is irrational. The data drawn from this study will be used to reveal forms of malpractices in prescribing in dermatology and indicate the areas for intervention. Short falls in prescribing deduced from this study will assist the MOHSW, health planners, and health providers to formulate appropriate strategies to improve these practices. Moreover, the study will generate information relevant for prescribers who are supposed to make rational prescribing. Pharmacist will also benefit from the study for rational decision in planning, ordering, and dispensing. Findings on the patterns of the skin diseases will provide a basis for effective planning and policy implementation for management of these diseases.

1.5 Research Questions

- I. Is the prescribing for dermatological disorders rational?
- II. What are the top ten dermatological disease patterns?
- III. What is the extent of oral and topical antibiotic prescribing in dermatology?
- IV. What is the extent of the use of glucocorticoids and their combinations?
- V. Are the standard treatment guidelines available at health facilities?
- VI. Do prescribers use and adhere to STG?

1.6 Study hypothesis

Prescribing in dermatology outpatients department does not differ from STGs and WHO prescribing indicators in public and faith based Hospitals.

1.7 Study Objectives

To investigate spectrum of skin diseases and drug prescription pattern among out patients with dermatological disorders in public and faith based Hospitals in three regions of Tanzania

1.7.1 Specific Objectives

1. To determine the top ten recurring skin diseases to which treatments were sought.
2. To determine the prescribing pattern with regards to number of medicines per prescription, encounter with antibiotics, generic prescribing, encounter with injection, drug prescribed from EML and route of administration.
3. To determine availability of STGs and EML at the Health facilities
4. To assess if prescribers use and adhere to STGs with regard to diagnosis and medicines prescribed.
5. To determine adherence to WHO/INRUD core medicine use indicators

1.8 LITERATURE REVIEW

Inappropriate prescribing is a manifestation of irrational medicines use that occurs when medicines are not prescribed in accordance with the guidelines based on scientific evidence to ensure safe, effective and economic use. The underlying reasons for such practices on the part of prescribers and consumers need to be understood and addressed in any interventions (19). Various studies have been done across the globe to assess the trends in prescribing and patterns of skin diseases morbidity. In the United State of America, a study to evaluate dermatologic disease in family medicine noted that skin diseases accounted for 8% of all visits to family physicians in 2002–2005. The five most common skin disorders diagnosed by family physicians were dermatitis, pyoderma, tinea, benign neoplasms, and candida infections. The three most commonly prescribed medication classes for skin problems were antihistamines, topical anti-infective, and adrenal corticosteroids. The family physicians diagnosed a wide range of skin disorders and noted unnecessarily increased use of antibiotics prescribed to treat them (30). In Brazil the study of nosologic profile of dermatologic visits reported that dermatoses acne, superficial mycoses, pigmentation disorders, actinic keratosis, atopic-contact eczema and pyoderma (impetigo and folliculitis) were the most public health problem (31).

A study done in India on morbidity profile and drug utilization patterns in allergic diseases in skin for outpatients revealed disease patterns of dermatitis, urticaria and, atopic dermatitis. Of the total drugs prescribed, (54%) were oral formulations, (45%) for topical route and (37%) were fixed dose combinations. Antihistamines (34%) were the most commonly used oral drugs, topical drugs were prescribed mostly as combination of steroids, antifungal and antibiotics. Excessive use of oral formulations, preference for fixed dose combinations and use of brand names in all prescribed product evidenced high irrational prescribing in this study (4) Juno et al (32), found that the pattern of skin diseases in Rural India included eczema 16.5%, dermatitis (14.7%), urticaria 7.5%, polymorphic light eruption 4.75% and tinea infection 10.25%. The commonly prescribed drugs were antihistamines, antifungals, antibiotics, and corticosteroids. Eczema was the highest presentation and antihistamines was the most commonly prescribed drugs (32).

Irrational prescribing is often associated with shortage of skilled man power or lower level of education. Studies done in the United Kingdom (UK) on unselected populations suggest that around 23-33% have a skin problem that can benefit from medical care at any one time. Surveys noted that around (54%) of the United Kingdom population experience a skin condition in a given twelve month period. Most of population (69%) practice self-care with few seeking medical advice from doctors, high sales of OTC skin products suggested that people buy many products from pharmacies. Irrational prescribing occurred with majority of people who were attended by independent and supplementary prescribers for skin diseases who have little or no training in dermatology (33).

The same situation was seen in South west Nigeria-Osun state in the study by Babalola et al (34), where poly pharmacy, the high use of antibiotics and injections was high at the primary health care level and were coupled with shortage of high skilled manpower (34). The study reported high rate of antibiotic 50% and injection 72.7% being prescribed by lower cadres' health assistance, community health workers and nurses as compared to physician and pharmacists. To tackle the problem the study suggested recruitment of skilled personnel and continuing educational programs for primary health care workers. Antibiotics are medicines most commonly prescribed, the use of antibiotics if irrational through irrational prescription would lead to development of drug resistance thus results in treatment failure to the common bacterial infections. The study in Wassa West (Ghana) on prescribing patterns with special reference to antibiotics reported the poor prescribing performance of health centers reflected by lower cadre of prescribers working at this level of health facilities as compared to district hospital (35).

Drugs are hazardous and potentially toxic, inappropriate prescribing of medicines may cause harm to the patients and loss of life. Oral Isotretinoin is primarily used as a treatment for severe acne that does not respond to other treatments. Although effective for treating severe acne is a potent human teratogen, it cause severe birth defects when exposed to pregnancy mothers. So pregnancy prevention is of paramount importance for women taking isotretinoin. In South Africa, a retrospective analysis of the prescribing patterns of isotretinoin was conducted during 2005 and 2006 reported high number of female patients of child-bearing potential claiming their isotretinoin prescriptions. The study reported an

increased use of isotretinoin and great concern for irrational prescribing of the drug to a substantial number of females of child-bearing potential (36). An observation from a study in Saudi Arabia showed that some dermatologist did not comply with the prescription guidelines of isotretinoin for female of child bearing potential, thus 3 of 7 of female received isotretinoin had their pregnancy terminated (37).

The uses of topical cortical steroids in dermatology pose a great concern; potent cortical steroids if not used rationally can course serious cutaneous and systemic effect such as skin thinning (atrophy), increased risks of skin infections to bacterial and virus, percutaneous absorption that may lead to systemic effects especially in children, hypersensitivity, immunosuppressant and tachyphylaxis. Therefore, steroid drugs should be used with care considering the site of application and age of the patients. The study in India reported high use of very potent cortical steroids in combination with antimicrobial by 51.8% of inpatients and 28% outpatients respectively (38). The high use cortical steroids were also reported in Sichuan province China (39), where the percent encounter with glucocorticoids was 19.99% and percent encounter with both glucocorticoids and antibiotics was 16.67%. The reason behind irrational medication uses were attributable to lack of medical knowledge of rational medication uses among rural doctors and lack of medical devices for disease diagnosis in those township health centers. The study recommended enhancement of professional training in rational medication uses for rural doctors, improve health facilities for township health centers and promote health education to rural residents (39). Similar observations were also made in Western Nepal that topical corticosteroids and their combinations were the most prescribed drugs. (40).

The use of standard treatment guidelines (STGs) is one of the core strategies used to promote rational use of medicines. The STGs are systemically developed statements to help prescribers make decisions about appropriate treatment for specific clinical conditions. STGs offer a number of potential advantages for patients, health providers, medicines supply managers, and health policy makers. Consistency among prescribers leads to reduced confusion and increased adherence to treatment by patients. Also most effective treatments are prescribed which help to improve supply of drugs if medicines are prescribed only when needed. Therefore, every prescriber is supposed to have the STG

copy for quick reference when the need arise. The study in Ghana at Tamale hospital found that standard treatment guidelines and essential medicines lists were largely available and therefore STGs availability was not a major challenge to compliance with the standard provisions in the hospitals surveyed (41). In Lesotho, a study on antibiotic prescribing in 6 hospitals reported an average availability and adherence of prescription to STGs was 64.67% and 42.8% respectively (42). Such observation was also noted in Ujjain India (43), that adherence to treatment guidelines for acute diarrhea in children up to 12 yrs was low. In Namibia, the study findings show that overall compliance with the STGs was 55.1%, and availability of STGs among prescribers varied considerably from 60% to 94% in health facilities surveyed (44).

Polypharmacy is a common type of irrational use of medicines. Prescriptions of many drugs to a patient has undesirable clinical and financial consequences to patients. Polypharmacy is usually judged by measuring the average number of medicines per prescription. The higher number of drug per prescription was noted in South West Nigeria (Osun state) where they reported an average number of drugs per encounter to be as high as 6.11 (34). Similar observations were reported in Western Nepal, India and Iran Republic from studies with average number of drugs per prescription prescribed 2.42, 2.79 and 3.4 respectively (4,40,45). WHO recommends that the average number of drugs to be prescribed range 1.6 – 1.8. The lesser the number of drugs prescribed per prescription the better for rational use of medicines.

Countries in the East Africa had occasionally employed WHO/INRUD drug use indicators to assess and improve the way in which drugs are prescribed, dispensed and used. Elsewhere, these indicators have been used widely to assess the quality of prescribing in health delivery system. A survey in Kenya, to assess essential medicines of healthcare system and households in Public and Faith Based Health Facilities, reported the average number of drug per prescription to be 3.0 for both public and faith based owned facilities (46). Prescribing by generic name was extremely low in both Public and Faith based sector. Another study in Kenya reported the mean number of drugs per patient encounter to be 2.7, and that only (45.5%) of the drugs were prescribed using generic names (47). Similarly, in Tanzania the results from the Baseline survey of pharmaceutical sector 2002

reported an average number of drug per prescription 1.8 which was in accordance with WHO standards. Other two studies in Tanzania reported an average number of drug per prescription to be 2.3, while generic prescribing was 87% and 75.5% respectively (48, 49). In Uganda, a baseline survey study on pharmaceutical sector of 2008 in public health facilities reported an average number of drug per prescription to be 3.2 which was considered adequate, where each patient received 3 or 4 drugs (50).

Over prescribing of antibiotics and injection is a common type of inappropriate medicine use. Antibiotics has many negative effects including encouraging the development of antimicrobial resistance, Injectable formulations are relatively expensive and require additional expenses such as needles, syringes and other associated medicine administration costs. Also injections contribute to increased risks of infection transmission e.g. Hepatitis B and HIV. In Kenya a study found high prescribing of antibiotics 76.7% and 68.4% in public and FBHF respectively. In the government health facilities, percentage of patients prescribed one or more injections was found to be 13% compared with 27% in the FBHF sector. Also another study in Kenya reported the high use of antibiotics prescribed (74%) and injections was prescribed by (13.2%) which was within the required range (47).

Similar situation was observed in Uganda, a baseline survey study of 2008 reported an average of 66.7% and 16.7 % of patients received one or more antibiotics and injections respectively. The use of antibiotic was considered high indicating irrational prescribing pattern for antibiotics while the use of injection was considered adequate (50). The median percentage of drugs prescribed that were on the Essential Drugs List of Uganda in public health facilities was 93.5%. Regarding the use of injection, the situation in Tanzania was not different from Kenya and Uganda, a study conducted between 1999 and 2001 showed that in private dispensaries over 70% of patients attending out-patient clinics received at least one injection per encounter, a value higher than WHO recommended target of 17 % (51).

Another study on prescribing habits in church owned primary health care facilities that was conducted in Dar es Salaam and Coastal Region reported the encounter of Antibiotics and injections to be 35.4 and 19 %, respectively. In this survey, most drugs were prescribed according to EML. The study showed that there was an overuse of injections

compared to the recommended figure of 15% (49). For the malpractices of irrational prescribing observed, the study suggested the need for educational intervention to prescribers (48).

A national Essential Medicines List (EML) and Standard Treatment Guidelines (STG) or Clinical guidelines are key documents for ensuring that medicines are procured, prescribed and dispensed rationally and in line with public health priorities. In Uganda, the availability standard treatment guidelines in public and mission health facilities was 80.6% and 93.9% respectively (50). In Kenya the guidelines were not available to most health care professionals, the study established that availability in public facilities was 41.7% while that in Faith based owned facilities was 25%. This was higher compared to the findings of the study done in Tanzania in 2002 which reported that STGs & EML in public health facilities were available by 25% of the premises surveyed (52).

In Tanzania there is limited information in the literature regarding prescribing patterns in dermatology. However, several other related studies which evaluate the medicines use situation using WHO/INRUD tools are available as discussed in the above paragraphs.

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study Area

The study was conducted in three regions, namely Morogoro, Dar es salaam and Kilimanjaro. It involved referral regional health facilities which were either public or faith based owned. Morogoro region hospital is the referral point that serves the whole region. St. Francis Ifakara, a referral mission hospital located in this region, was also included. One of the Hospital from Moshi Municipality in Kilimanjaro, Mawenzi Regional Referral Hospital consented. The other one namely KCMC Referral Hospital did not consent to participate. In Dar es Salaam region, one Regional referral hospital (Temeke) and one faith based Hospital (Shree Hindu Mandal) were included in the study.

2.2 Study Design

The study design was cross sectional retrospective and prospective. The study was conducted retrospectively for collecting data from medical records for skin diseases spectrum and prescribing indicators that were recorded between January to December 2014. Prospectively, structure questionnaires were used to collect data from OPD prescribers regarding availability and utilization of Standard Treatment Guidelines (STG).

2.3 Study Population

The study population included 43 OPD prescribers available at the time of conducting the study and 4520 OPD prescribing records of skin disorders from which 1020 study sample were obtained through random sampling. The target population included Outpatient Department (OPD) prescribing records covering one year study period (January to December 2014). The study units were all referral regional hospitals which were either public or faith based organization (FBO) from Dar es Salaam, Morogoro and Kilimanjaro regions.

Faith Based Organization (FBO) provide a substantial contribution in health care delivery in Tanzania, it is the second biggest health care provider after the public sector. Currently 40% of health facilities are owned by private sector which include faith based

-organization (FBO), private for profit providers and Civil Service Organization. The public sector contribute 60% of healthcare services. The Ministry of Health contracts selected health facilities owned by the main Faith based provider to deliver care at subsidized cost to most underserved population in the country through service level agreements. The Government through the MOHSW provides grants in aid to the Faith Based Organizations according to the contract service agreements. Similarly, the MOHSW supports Faith Based Organizations by providing them with qualified staff through secondment arrangements. Like public health facilities, FBO acquire essential medicines, Standard Treatment Guidelines (STG) and Essential Medicines lists (EML) from MSD.

2.3.1 Sampling Procedures

The study employed Mixed Sampling Procedure to select health facilities, purposeful sampling included referral public and faith based health facilities in Morogoro and Kilimanjaro regions. In Dar es salaam, one public health facility was selected using simple randomly sampling (lottery method) among three available (Mwananyamala, Temake and Amana). One faith based hospital (Hindu Mandal) was purposeful selected. The study employed WHO guidelines for comparison of drug use involving more than one health facility to obtain the study sample of encounters (17). A number of encounters used for this study were based on WHO guidelines which require a minimum of 600 encounters for a cross section survey taken from 20 health facilities at the rate of 30 encounters per facility. However, WHO recommends a minimum of 100 encounters or more if a single facility is involved (53).

2.3.1.1 Sample size Calculations

The sample size of prescribing encounters and that of OPD prescribers were obtained using the following calculations:

2.3.1.1.1 Sample size for a number of Encounters

1. WHO recommends:
 - A. A minimum of 600 encounters to be included in cross-sectional survey (54).
 - B. This is equivalent to 30 encounters per facility if 20 health facilities are included
 - C. At least 100 encounters if individual health facilities are studied.

2. In this study the maximum total of 200 encounters per health facility was chosen
3. Sample size of 200 encounters per facility covered one year period records (retrospectively)
4. To obtain an average of encounters per health facility per month: X/Y (55).
 - $X = \text{Total encounters per year per facility} = 200$
 - $Y = \text{Number of month in a year} = 12$
 - $\text{Number of Health facilities} = 5$

$$\therefore 200 / 12 = 16.66 \approx 16.7 \text{ rounded to the whole figure } 17$$

- $\text{Average number of encounter per month selected randomly} = 17$
- $\text{Total encounters per health facility per year becomes } 12 \times 17 = 204$

Total sample size of the study: $12 \times 17 \times 5 = 1020$

\therefore Total Sample size of the study was 1020 encounters

2.3.1.1.2 Sample Size of Prescribers

Given that there was small number of prescribers available in the public and faith based health facilities. The prescribers that happened to be available at the time of data collection were enrolled. A total of 43 prescribers from OPD of each of the 5 health facilities were interviewed.

2.4 Pre-Testing of Tools

The data collection tools (structured questionnaire and prescribing indicator forms) were tested at 2 different facilities in order to validate them prior to rolling out to a larger scale. The health facilities involved were Makandana Hospital Tukuyu and Tumbi Designated Hospital Kibaha.

2.5 Ethical Considerations

The Ethical clearance was granted by the Ethical Review Committee of the Muhimbili University of Health and Allied Sciences (MUHAS). The study involved interviewing clinicians and dispensers using questionnaires on the availability and usage of standard treatment guidelines and essential medicines list. Consent was sought from participants. Informed consent forms were provided in order to request them to participate in the study

(appendix 4). The participant were assured of confidentiality, and that no reference would be made to specific respondent or study units. The investigator sought permission from relevant authority offices before visiting the selected health facilities.

2.6 Inclusion Criteria

All prescribed records in the OPDs with diagnosed skin diseases for the period of one year from January - December 2014 were included. All prescribers or clinicians that attended patients in the OPD at the time of this study were likewise included.

2.7 Exclusion Criteria

The following records were excluded from the study, OPDs records with **diagnosis diseases** other than skin diseases. Prescriptions of skin diseases associated with HIV infections. Prescriptions with other co-morbidities.

2.8 Data Collection Techniques

Data for prescribing indicators was collected retrospectively using “WHO Prescribing Indicator Form”. The form encompassed all necessary data obtained from the hospital records on patterns of prescribing. For Health facility indicators, data were collected prospectively using structured questionnaire to assess the availability and utilization of STGs and EML, (Appendix 1 – 7)

2.9 Data Management and Analysis

Data collected on survey forms, WHO Prescribing Indicator Form; quantitative variables for computation of spectrum of skin diseases, average number of drugs per prescription, percentage of generic drugs prescribed, percentage of medicines prescribed from essential drugs list, percentage of encounters with antibiotics and injections prescribed and proportions of drugs prescribed as topical or oral route were calculated and summarized on the Simple Prescribing Indicator Form, (Appendix 6; WHO/DAP/93). From survey forms, data were recorded to Microsoft Excel spread sheet and exported to Statistical Package of Social Sciences (SPSS Version 20.0) for cleaning and analysis.

From a structured questionnaire, qualitative variables such as demographic data of the prescribers (sex, experience and profession-independent variable), availability of STG

(independent), utilization of STGs (dependent) data were also analyzed using SPSS under descriptive statistics. Mean (average), minimum and maximum values and the confidence intervals for indicators were generated using Epi-info 7 software. Statistical significance for categorical variables was tested using the Chi square at 5% level of significance. Differences with p-values less than 0.05 were considered significant. The findings were presented using tables, bar charts, pie charts, and other relevant graphics.

2.9.1 Assessment of Adherence to STGs

Utilization of STGs and EML was measured by looking into the patients files, copies of NHIF claim forms, outpatient treatment registers and Health Management Information System, HMIS (MTUHA), where patient records, diagnosis and prescribed medicines were being recorded. Adherence to STG was measured basing on the following considerations; where medication is given for incorrect diagnosis, wrong medication is selected for diagnosis, dosage is inadequate or length of treatment is too brief compared to that in STG, brand-name medicine is used instead of generic equivalent, route of administration, medication is not needed and where two or more medications are used when fewer would achieve the same effect.

At each health facilities 204 prescriptions encounters were reviewed. Adherence of prescribers was analysed for compliance with STGs and prescribing indicators. This was achieved by reviewing the records of prescription encounters on selected diseases (mainly from the top ten list). The skin diseases reviewed were selected because they are common and frequently encountered in the Outpatient Department (OPD). The assessment included bacterial skin infection (pyoderma), atopic dermatitis, fungal infection, acne vulgaris, allergic contact dermatitis, nonspecific dermatitis, urticaria, vitiligo, scabies and pruritus. It was important to take care that the same patient not selected more than once for the same skin disease. This was done by checking the patient's demographic profile.

2.10 Study Limitations

The study used the WHO prescribing indicators, which were supposed to record exactly what is prescribed to patients, but not why. In order to explain why, other techniques are needed (qualitative approach). The indicator studies may indicate over or under consumption of medicines. However, it does not provide details on the nature of an irrational use.

The study for prescribing indicator was a retrospective review of prescriptions from OPD register or patient files. Some records in the (HMIS-MTUHA) books were partially filled, missing or poorly written. (Investigator consulted the prescribers at the time of data collection to clear doubt on missing data or poorly written text. Records that with illegible handwriting, were left out.

The investigator could not collect data from one health facility. The sixth health facility did not grant permission within the time frame. However, the study still possess more than minimum sample size of encounters recommended by WHO.

CHAPTER THREE

3.0 STUDY RESULTS

3.1 Introduction

This chapter presents results that were obtained from the survey conducted in 5 health facilities including three public and two faith based owned facilities. The results are presented in tables and figures preceded by brief explanations of findings. The survey took place between March and April 2015 in three regions (Dar es salaam, Morogoro and Kilimanjaro).

3.2 Demographic profile

A total of 1020 patient records (encounters) of skin diseases from dermatological outpatient clinics were reviewed. Of the total records reviewed, 569 (55.8%) patients were females and 451 (44.2%) patients were males. The mean age of the female patients was 28.2 ± 17.9 years and 26.9 ± 17.6 years for male patients. The patient's ages ranged between 0.25 – 80 years.

The subjects were categorized depending on their age group relative to gender distribution. It was noted that in the age groups between 0-10, 11-20 and 11-30 both females and males were mostly affected. Majority of the male patients were in the age group of 21-30 (24.2%) and female patients were in the age group between 11-20 years (20.7%). The detailed information is given in Table 2;

Table 2 : Distribution of Patients with Dermatological Disorders by Gender and Age

Age group	Female n=569	Male n= 451	Total
10 and below	104 (18.3%)	95 (21.1%)	199
11 - 20	118 (20.7%)	92 (20.4%)	210
21 - 30	114 (20.0%)	109 (24.2%)	223
31 - 40	100 (17.6%)	54 (12.0%)	154
41 - 50	67 (11.8%)	54 (12.0%)	121
51 - 60	36 (6.3%)	28 (6.2%)	64
61 - 70	21 (3.7%)	12 (2.6%)	33
71 - 80	9 (1.6%)	7 (1.5%)	16
Total	569 (100%)	451 (100%)	1020

In table 3, a total numbers of 43 health workers including prescribers, nurses and pharmacist were interviewed of which 79 % were men. About 68.9% of the prescribers had over four years' of profession experience.

Table 3: Social-demographic characteristics of prescribers

		Demographic variable	Frequency (n=43)	Percent %
1	Sex	Male	34	79.1
		Female	9	20.9
		Total	43	100
2	Academic Qualification	Certificate	0	0
		Diploma	15	34.9
		Advanced diploma	13	30.2
		Degree	14	32.6
		Masters	1	2.3
		Total	43	100
3	Occupation	Clinical Officer	13	30.2
		Nursing officer	1	2.3
		Amo	11	25.6
		Medical Doctor	8	18.6
		Pharmacist	6	14
		Pharm Technician	2	4.7
		Dermatologist	2	4.6
		Total	43	100
4	Working Experience	1-2 years	6	14
		3 years	7	16.2
		>4 years	30	69.8
		Total	43	100

3.3 Prescribing Patterns in Public and Faith based Health Facilities

During the study period from January to December 2014, a total number of 2151 medicines were prescribed on 1020 prescription encounters studied as presented in table 4.

Table 4: Type and Route of Administration of the Prescribed Drugs

SN	Type of Medicines Prescribed	Frequency (%)	Oral	Topical	Intra muscular
1	Steroids	760 (35.3%)	100 (4.7%)	616 (28.6%)	44 (2.1%)
2	Antibiotics	504 (23.4%)	293 (13.6%)	201 (9.3%)	10 (0.47%)
3	Antifungal	289 (13.4%)	120 (5.6%)	169 (7.9%)	
4	Antihistamine	178 (8.3%)	173 (8.0%)	5 (0.23%)	
5	Keratolytics	165 (7.7%)	14 (0.65%)	151 (7.0%)	
6	Others	255 (11.9%)	187 (8.7%)	68 (3.2%)	
8	Total	2151 (100)	887 (41.2%)	1210 (56.3%)	54 (2.5%)

N.B: Others include; antiseptics, analgesics, vitamins, antiparasites, anti-viral, sunscreens and emollients

In table 4, it is notable that, steroids were the most prescribed medicines 35.4% followed by antibiotics (23.5%) and antifungal (13.4%). Topical formulations prescribed drugs accounted for (56.3%), oral medications (41.2%), and parenteral medication (2.5%). Most drugs were prescribed as single formulation. The fixed dose combinations (FDCs) were (6.9%) while oral Antibiotics (13.6%) were most commonly used. The most commonly prescribed topical medicines were steroids and their combinations (28.7%).

3.4 Percentage of Encounter with Glucocorticoids Prescribed

About 53.7% of prescriptions contained any glucocorticoid. Among the top 10 common diseases, glucocorticoids were prescribed mostly for atopic dermatitis 24.3% (133/548), contact dermatitis 14.1% (77/548) and non-specific dermatitis 8.8%, which were much higher than other diseases. However, unexpectedly glucocorticoids were also prescribed for other skin disorders including acne vulgaris 2.4% (13/548), cellulitis 2.2% (12/548), and impetigo 1.1% (6/548).

3.5 Prescribing Indicators

3.5.1 Average Number of Drugs per Encounter

The average number of drugs per encounter ranged from 1.9–2.5 across the different Health facilities surveyed, with a mean of 2.11 (SD 0.64). The calculated 95% confidence strongly suggest that, the true mean of the study for average number of drug per prescription lies between 1.9 and 2.3. Considering individual prescriptions, number of medicines prescribed ranged from 1-5. The Faith based Referral Hospitals had slightly higher (2.2 and 2.5) number of drugs prescribed than the WHO standards (1.6-1.8) (48), figures around 2 are accepted, so these values were within acceptable range.

Table 5: Comparative Means of Core Drug use Indicators in the studied Health Facilities

Indicators	Average no. drugs/encounter	% drugs by generic name	% antibiotic encounters	% injections encounters	% drugs Prescribed from EML	% of key indicator drugs in stock
WHO standard values	1.6 – 1.8	100.0	20.0 –26.8	13.4-24.1	100.0	100
National baseline Survey 2002	1.8	82	42	14	98.5	87.3
Study average at 95% CI	2.11 (2.0,2.3)	75 (68.6,79.7)	38 (34,42.3)	5.0 (2.1,7.6)	85 (82.4,87.9)	84 (76.0,93.3)
Health Facility	Mean (SD)					
Temeke Regional Hospital	2.0 ± 0.5	77.8	36.8	1.5	81	73.3
St.Francis Referral Hospital	2.2 ± 0.6	76.0	39.2	4.9	84.4	100
Morogoro Regional Hospital	2.0 ± 0.7	77.0	31.4	10.8	90	80
Hindu Mandal Hospital	2.5 ± 0.7	62.8	36.8	6.4	82	73.3

Mawenzi Regional Hospital	1.9 ± 0.6	81.8	46.0	1.5	87.4	93.3
Maximum	2.5	81.8	46	10.8	90	100
Minimum	1.9	62.8	31.4	1.5	81	73.3

Key:

SD = Standard deviation

3.5.2 Percentage of Drugs Prescribed by Generic name

Table 5 shows that the percentage of drugs prescribed by generic name across the health facilities surveyed ranged from 62.8 – 81.8 %, with a mean of 75% (SD 7.2%). Mawenzi Hospital had the highest generic prescribing rate 81.8%, followed by Temeke 77.8%. Hindu Mandal Hospital had the lowest generic prescribing rate 62.8%.

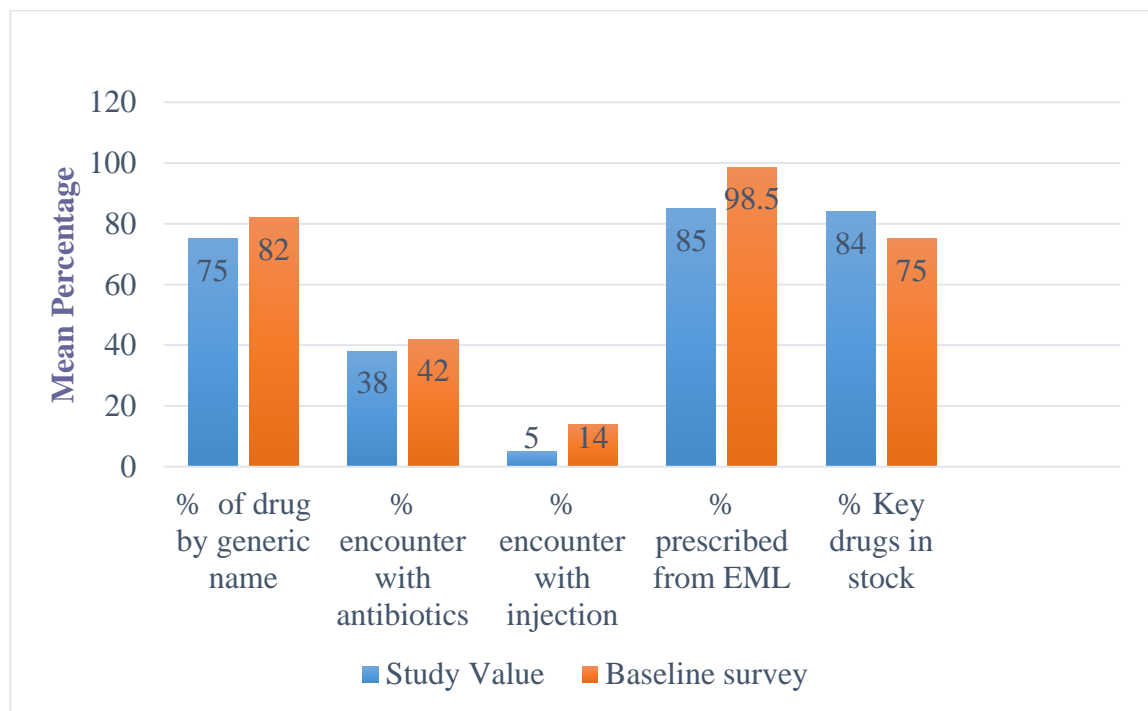


Figure 4: Mean Percentage core prescribing Indicators relative to National Baseline survey 2002

3.5.3 Inter Health Facilities Variations of Prescribing and Health Facility Indicators

The data obtained from the study indicate the following results as portrayed in figure 5;

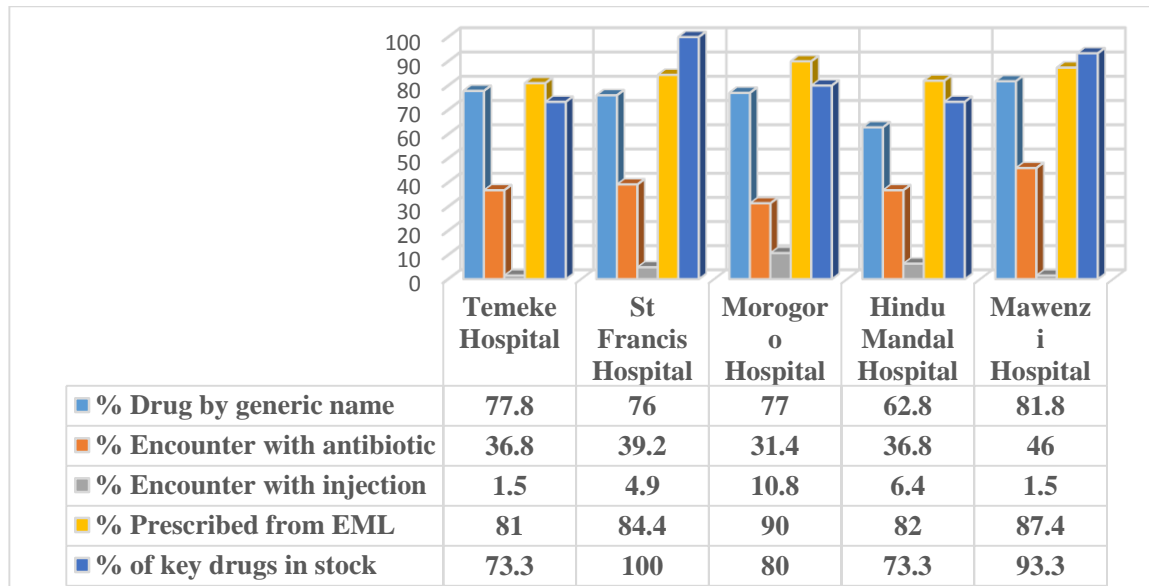


Figure 5: Comparative prescribing and health facility indicators for studied health facilities.

3.5.4 Percentage of Encounter with Antibiotics and Injections

In Table 5 and Figure 5, the percentage of encounters with an antibiotic prescribed ranged from 31.4%–46.0%, with a mean of 38% (SD 5.3%). The number of prescriptions to which injection was encountered was 5% (SD 3.9%). On average the percentages were below WHO value with a considerable variation among facilities ranging between 1.5 % and 10.8 %.

3.5.5 Percentage of drugs prescribed from Essential drug list (EML)

Table 5 and Figure 4, shows the percentage of drugs prescribed from the EML or formulary to range from 81%–90%, with a mean 85 % (SD 3.7%). When the data is disaggregated by hospital, Morogoro Regional Hospital had the best performance in this indicator amounting to 90% of all prescribed medicines. Temeke Hospital was the lowest performer with 81% of the medicines prescribed on the EML.

3.6 Health Facility Indicators

3.6.1 Availability of copy of Standard Treatment Guidelines & Essential Medicines Lists

Every Prescriber is supposed to have a copy of STG when prescribing. Findings from this study revealed that 31/43 (72%) of the prescribers reported to consult STGs as a basis for prescription and clinical case management. Only 28/43 (65 %) of them had copies of STG on their working desks.

A higher proportion of prescribers in faith based hospitals 80% (12/15) were found to have STGs on their working room/desks as compared to public health facilities 57% (16/28). However the difference was not statistically significant, P-value 0.134

3.6.2 Prescriptions adherence to STG at Health Facilities

It was observed in this study that 68.7% of the studied prescriptions adhered to STGs in both Public and faith based health facilities. Adherence was highest in Public Health facilities 75% with the lowest in Faith based Health facilities 59.3%.

Table 6: Proportion of Patients Treated According to STG and Type of Health Facility

	Adhered to STG		Not Adhered		Total
Faith Based Health facilities	242	(59.3%)	166	(40.7%)	408
Public Health facilities	459	(75%)	153	(25%)	612
Total	701	(68.7%)	319	(31.3%)	1020
$X^2 = 28.02$ P-value < 0.001					

The observed differences 59.3% and 75% between public and faith based health facilities on adherence to STGs in treatment of patients were indeed statistically significant: $X^2 = 28.02$, p-value < 0.001

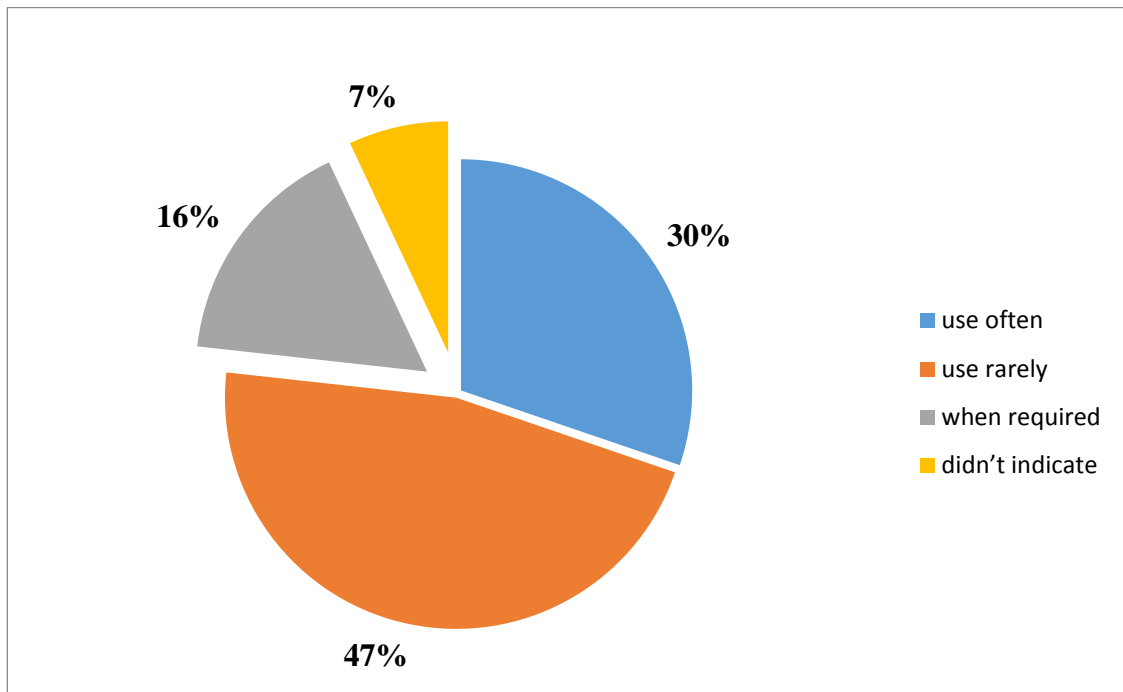


Figure 6: Response of prescribers on frequency of use of STGs from both public and faith based health facilities

3.6.3 The frequency of use/consulting STGs by the prescribers in five health facilities

Regarding the frequency of use of STGs, about (47%) of prescribers reported to have been using STG rarely. Those who consulted STG often as a basis for clinical case management amounted to 30%. (Figure 6)

Table 7: Reasons for not Consulting STGs

Reasons	Frequency	Percent
Do not have any copy	10	50
Adequate knowledge and experience in the field	5	25
Heavy patients load	3	15
No new information added	2	10
Total	20	100

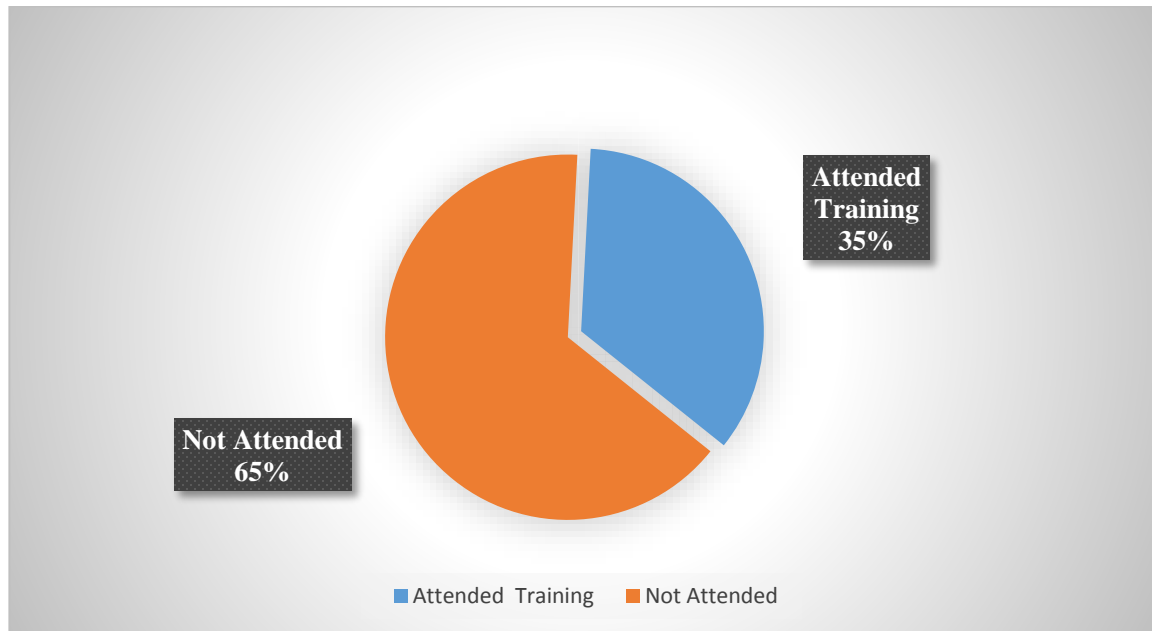


Figure 7; Proportion of OPD prescribers in public and faith based health facilities attended trainings on RUM

Figure 7 show that about 35 % of prescribers from both public and faith based health facilities had attended in service training on rational use of medicines.

Prescribers in faith based health facilities reported to have attended in service training on rational use of medicines in high proportion compared to public health facilities. Figure 8 summarizes these findings;

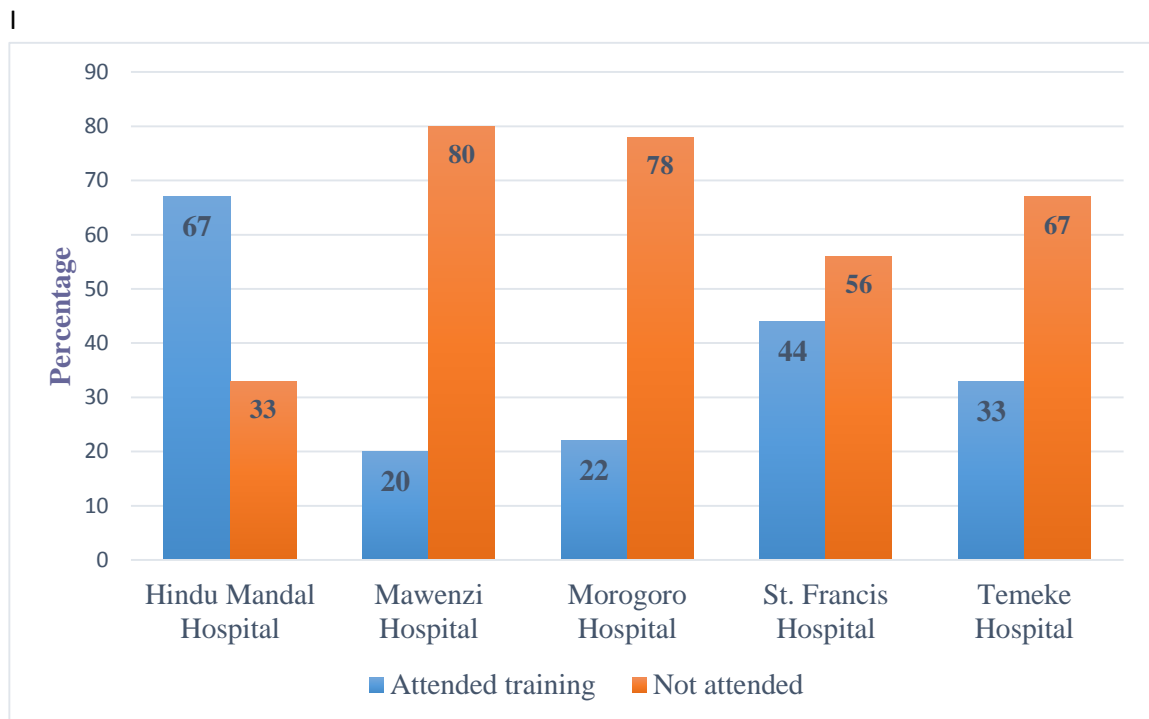


Figure 8: Proportion of OPD prescribers by Health facilities attended in-service training on rational use of medicines

3.6.4 Reported Strategies Used in the Hospitals to Improve Prescribing Practices

The following responses (Table 8) were given when prescribers were interviewed on the approaches used to improve rational use of medicines; feedback through morning report (clinical meetings) was reported by 67.6% and 32.4 % of prescribers in public and faith based health facilities respectively. The second most employed approach reported was conducting of short course or in service training by 66.7% and 33.3% in public and faith based owned facilities. Increase availability and use of STGs was also an important strategy used. The use of Hospital Medicines and Therapeutic Committee as tool to improve RUM in their health facilities were reported by few respondents.

Table 8: Strategies Recommended for improvement of Prescribing Practice

Health Facility	Strategies used by health facilities to improve prescribing practices				
	short course or in service training	feedback through daily morning report	Availability and use of STGs	Periodic prescribing review by HMTc	Prescribing restrictions by HMTc
Public health facilities	14 (66.7 %)	25 (67.6 %)	10 (58.8 %)	1 (50 %)	3 (60%)
Faith based Health facilities	7 (33.3 %)	12 (32.4 %)	7 (41.2 %)	1 (50 %)	2 (40%)
Total	21 (100 %)	37 (100 %)	17 (100 %)	2 (100 %)	5 (100%)

3.6.5 Key Medicines Availability at Health Facilities

It was observed that in all health facilities, availability of 15 key essential drugs in stock ranged from 73.3 – 100% with an average of $84\% \pm 12\%$. The ability to prescribe drug rationally was influenced by two important components; adequate supply of essential medicines and access to unbiased information about these medicines. (Figure 4).

3.6.6 Availability of Reference Materials at Health Facilities

It was revealed that a total average percentage availability of reference books in all health facilities was $51\% \pm 22.2\%$. In all hospitals the staffs could produce a copy of either 2007 or 2013 edition of STGs. Mawenzi Regional Hospitals, had the highest percentage of 83.3% (8/11) of reference materials. Temeke and Hindul Mandal Hospitals had the lowest percentage 27%, (3/11) availability of the reference materials.

The study also found that Hindu Mandal and Temeke Hospitals had addition copies of reference books which were found at health facilities and were not initially included in the standard list. Some of these books were; A to Z drug facts (February 2007 8 edition), Antibiotics protocol, Drug information, a guide for pharmacist, (Fourth edition-August 2011). Essential drugs 3rd edition 2006, Mimis June-2008 and Hand book of dermatology for primary health care (A practical guide to diagnosis- march 2007)

Table 9: Availability of Reference Materials at Health facilities

Reference Books	NAME OF THE FACILITY				
	Morogoro Regional Hospital	St.Francis Hospital	Mawenzi Regional Hospital	Temeke Regional Hospital	Hindu Mandal Hospital
Tanzania STG & EML	Yes	Yes	Yes	Yes	Yes
Tanzania National Formulary (TNF)	No	Yes	Yes	No	No
Malaria Diagnosis & Treatment Guidelines	Yes	Yes	Yes	No	No
IMC Guidelines	Yes	No	No	Yes	Yes
British National Formulary (BNF)	Yes	Yes	Yes	No	Yes
Tanzania Pharmaceutical Hand Book (TPH)	No	Yes	Yes	No	No
HIV/AIDS STG	Yes	No	Yes	Yes	No
British Pharmacopoeia	Yes	Yes	No	No	No
TB/Leprosy STG	Yes	Yes	Yes	No	No
WHO Model Formulary 2008	No	No	No	No	No
Good Dispensing Manual	No	No	Yes	No	No
Percent Availability	64%	64%	73%	27%	27 %

The data portrayed in Table 9 indicate that:

- All health facilities had Tanzania Standard Treatment guidelines (2007 or 2013)
- None of Health facilities had WHO model formulary-2008

3.7 Outpatient's Dermatological disease spectrum

Table 10 and 11 present profile of dermatological diseases from 5 health facilities. Basing on the clinical diagnosis by dermatologists or general practitioners, the skin diseases were categorised mainly in two groups, namely infectious and non-infectious dermatoses. Non-infectious disorders constituted 63.8% (651/1020) of all skin disorders, as against 36.2 % (369/1020) for infectious disorders. The common noninfectious skin diseases were eczematous diseases (atopic dermatitis, contact dermatitis, nonspecific dermatitis and

seborrhoeic dermatitis) present in 40 % (410/1020), acne vulgaris 8.4% (86/1020), pruritus 2.6% (27/1020) followed by keloid scar 2.5% and prurigo 0.9%. The common infectious dermatoses were bacterial skin infections (pyoderma) at prevalence of 19 % (194/1020) with cellulitis 5.6% (57/1020), impetigo 5.5% (56/1020), folliculitis 4.6% (47/1020) erythrasma and DCPA with 1.9% and 0.8%, respectively, (Table 13). Superficial fungal infections presented at the rate of 12.2% (123/1020) with dermatophytoses (tinea) accounting for 10.9%, (110/1020) and candidiasis 1.2% (12/1020). The commonest dermatophytoses were tinea corporis, tinea versicolor, tinea capitis and tinea unguium. Other infectious dermatoses found were scabies 3% (31/1020) and viral infection 2.1 % (21/1020).

Table 10: Morbidity Profile of Dermatological Disorders among Outpatients Consultation in Public and Faith Based Health Facilities

Column1	Column 2	(n =1020)
Dermatological disorders	No. of cases (n)	Percent
Infectious disorders		
Fungal Infections	123	12.1
Bacterial infection (Pyoderma)	194	19
Viral Infection	21	2.1
Parasitic Infection	31	3.1
Total	369	36.3
Non Infectious dermatological disorders		
Acne vulgaris	86	8.4
Allergic conditions		
Atopic dermatitis	152	14.9
Allergic contact dermatitis	86	8.4
Nonspecific dermatitis	52	5.1
Seborrhoeic dermatitis	34	3.3
Total	410	40.1
Papulo squamous diseases		
Psoriasis	17	1.7
Pityriasis alba	8	0.8
Lichen planus	11	1.1
Lichen simplex chronicus	4	0.4
Total	40	4
Pigmentary disorders		

Vitiligo	35	3.4
Melasma	4	0.4
Leukoderma	8	0.8
Total	47	4.6
Allergic reaction/itchy		
Urticaria	44	4.3
Pruritus	27	2.6
Pruritic papula eruptions	11	1.1
Prurigo nodularis	19	1.9
Allergic drugs reactions	9	0.9
Total	110	10.78
Miscellaneous		
Photodermatitis	3	0.3
Keloid scar	25	2.5
Hemangioma	1	0.1
Erythroderma	10	1
Erythema	4	0.4
Actinic cheilitis	1	0.1
Total	44	4.3

Table 11: Infectious Dermatological Disorders

(n =1020)		
Bacterial infection (Pyoderma)	No of cases (n)	Percent
Cellulitis	57	5.6
Impetigo	56	5.5
Folliculitis	47	4.6
Erythrasma	19	1.9
Dermatitis cruris pustolosa atrophicans (DCPA)	8	0.8
Furuncles	3	0.3
Tropical ulcer	4	0.4
Total	194	19.1
Fungal infections		
Tinea versicolor	41	4
Tinea unguium	10	1
Tinea pedis	18	1.76
Tinea cruris	4	0.4
Tinea corporis	19	1.86

Tinea capitis	18	1.76
Candidiasis	12	1.18
Kerion	1	0.1
Total	123	12.06
Parasitic infection		
Scabies	31	3
Viral infection		
Molluscum contagiosum.	2	0.2
Herpes simplex	9	0.9
Chicken pox	2	0.2
Viral warts	8	0.8
Total	21	2.1

3.7.1 The Most Common Top Ten Skin Diseases

Table 12, Shows the pattern and magnitude of the most common ten skin diseases.

Table 12: Distribution of Ten Most Common Skin Diseases by gender.

SN	n=1020	Female	Male	Total (%)
$X^2 = 26.88$ P -value 0.002				
1.	Bacterial skin infection	98 (9.6)	96 (9.4)	194 (19.0)
2.	Atopic dermatitis	95 (9.3)	57 (5.6)	152 (14.9)
3.	Fungal infection	57 (5.6)	66 (6.5)	123 (12.1)
4.	Acne vulgaris	42 (4.1)	44 (4.3)	86 (8.4)
5.	Allergic contact dermatitis	52 (5.1)	34 (3.3)	86 (8.4)
6.	Nonspecific dermatitis	27 (2.6)	25 (2.5)	52 (5.1)
7.	Urticaria	35 (3.4)	9 (0.9)	44 (4.3)
8.	Vitiligo	24 (2.3)	11 (1.1)	35 (3.4)
9.	Scabies	13 (1.3)	18 (1.8)	31 (3.1)
10.	Pruritus	14 (1.3)	13 (1.3)	27 (2.6)
Total		457 (44.8)	373 (36.6)	830 (81.4)

The difference in the distribution of skin disorders among females and males was statistically significant $P < 0.05$ (0.002). (Table 12)

Table 13: Distribution of Total Dermatoses amongst Females and Males by Category

				X²	P-
value					
Category	Female	Male	Total	9.48	0.0021
Infectious	182 (17.8)	187 (18.3)	369 (36.2)		
Non-infectious	386 (37.8)	265 (25.9)	651(63.8)		
Total	568 (55.6)	452 (44.3)	1020 (100)		

Chi-Square value 9.48, P value < 0.05 (0.002). As p value is statistically significant; there is a difference in distribution of diseases amongst males and females in all observed dermatoses.

CHAPTER FOUR

4.0 DISCUSSIONS

4.1 Introduction

The chapter presents detailed discussions of Study results of skin disease profile and prescribing pattern for dermatology using the WHO/INRUD drug use indicators. The study to assess prescribing pattern in dermatology has never been conducted in Tanzania. Skin disorders occur in high frequency and medicines for treating them, if improperly used have clinical consequences and financial costs comparable to the patients suffering from other diseases conditions.

4.2 Compliance to Prescribing Indicators for Rational Use of Medicines

Inappropriate prescribing of medicines may lead to a significant risk of an adverse drug-related event, poor patient outcomes and wastage of scarce resources. Studies on prescribing patterns aim to monitor, evaluate and make rational use of medicines (15). Irrational prescribing have been observed to some extent in this study. The average number of drug per prescription 2.1 across all health facilities indicated a good performance though it was slightly higher than the WHO value (1.6-1.8) and 1.8 of the 2002 National Baseline Survey (49,52). The performance is considerably good since the average number of the medicines prescribed around 2 is acceptable. The value obtained from this study are higher than those of Yemen 1.5 and 1.3 of Zimbabwe (17) but similar to 2.1 of Malawi (56), and less than that of Uttarakhand, India 2.79 and 3.8 of Lesotho (4,41).

The findings of this study have revealed that faith based health facilities have slightly higher number of drugs per consultation in contrast to public health facilities despite that they have higher proportion of health workers who have attended RUM training and who own copies of Standard Treatment Guidelines. These differences can possibly be attributed to financial incentive which increases pressure on prescribing. In FBHFs some prescriptions had up to 5 medicines. However prescriptions with 5 medicines were few and majority had 1 to 3 medicines thus resulted to an average of 2.1 medicines per prescription (Table 5). Trend of elevated number of medicines per consultations in FBHFs

were also observed in the study done earlier in Tanzania that reported 2.3 drugs per consultations (49). Although these value are in acceptable range, and cannot be defined as polypharmacy, there is a need to check and monitor prescribing trend so that it does not go much higher to avoid consequence of possible polypharmacy to patients.

Generic prescribing measures cost effectiveness in health system to use and procure cheaper and affordable medicines. Generic analogue of drugs are cheaper than branded substitutes and have equal potency. WHO recommends prescribing by generic name by 100%. This may help to identify drugs clearly and enable better information exchange between the health care providers by ensuring the use of common terminologies among prescribers and dispensers in a health facility, thereby reducing dispensing errors. The average percentage of drugs prescribed by generic name across all health facilities was 75% (Table 5). Similar findings, which was 75.7% were also reported in another study in Tanzania (49). Lower percentages of generic prescribing were obtained for studies in Saudi Arabia (61.2%) and Lesotho (35.6%), respectively (42, 57). The very poor results were obtained in a study done in India (4), where all drugs were prescribed by brand name. However studies by WHO in other countries have shown that generic prescribing levels as high as 82–93% can be attained. The average percent of encounters with antibiotics prescribed of this study was 38% (Figure 4). This was higher than WHO standards but lower than (42%) obtained in national baseline survey (52). For injection results indicated (5%) which was much lower than the WHO value (13-24) % and 14% of national baseline survey.

Similar results were reported by Maini et al in India on drug utilization study in dermatology where percentage encounter with antibiotics and injection was 46.86% and 6.76% respectively (57). Another study conducted in Tanzania-Tanga region for diseases other than dermatology showed higher number of antibiotics 66.6% and injection 25.72% which were much higher than the findings of this study (28). In dermatology, the use of antibiotics can be reduced if prescribers reduce the use of fixed dose combinations topical preparations which contain antibiotics, antifungal and steroids where antibiotics are used when not indicated except for eczematous conditions which may occur with bacterial and fungal as secondary infections.

The low usage of injection in dermatological disorders found in this study was not unexpected. In normal situation most of skin diseases are treated by topical and oral route rather than parenteral route. Most of the injectable medications in dermatology are antibiotics and steroids. It was found in this study that of all drugs prescribed, steroids constituted the largest part 35.4% followed by 23.4% of antibiotics (Table 4). Of all medicines prescribed 56.3 % were prescribed to be administered topically and 41.2 % by oral route and less than 2.5% by parenteral route. Similar results were reported in other studies in India that, 60.2% of medicines were for topical route, 38.1% for oral route and 1.7% by injectable route (58). On the other hand Dutta et al (4) in India reported oral route 54.18%, and topical formulation 45.82% respectively. The fixed dose combination of prescribed drugs was 37% higher than that obtained in this study which was 6.9%.

On average, a high proportion of drugs prescribed in this study (85%) were from the EML, the range across health facilities was from 81% to 90 % (Table 5). This range seem to be so encouraging as it shows how closely we are to reach 100 % which is the WHO standard values. The good performance should be maintained to provide cheaper, affordable and safe treatment in dermatology. However, the high rate of drugs prescribed from the EML appears somehow to conflict with the low rate of generic prescriptions (75%) as evident from Figure 4. This may be because some commonly brand names e.g. Aspirin (Acetylsalicylic acid) or Whitfield's ointment (Compound benzoic acid and Salicylic acid) do exist in the EML (3). The earlier study-field test in Tanzania (1991) reported 88% of drug prescribed from national drug formulary (17), and the later Baseline survey of pharmaceuticals in Tanzania (2002) reported 98.5% which was higher than this study. These findings could also be supported by good results reflected by health facility indicator of this study. As indicated in figure 4, key essential drugs in stock was available by 84%, this can improve rational use of medicines through use of generic and essential drugs.

4.3 Compliances with health Facility Indicators.

The World Health Organization report that in developing countries, in primary care 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 (18). Results in table 6 of this

study has established that 75% and 59.3% of the patients were treated according to STGs in public and faith based health facilities respectively, with overall adherence of 68.7% (Table 6). The observed difference was statistically significant ($P < 0.001$). In Namibia the study for some selected diseases conditions including pneumonia, diarrhea, candidiasis and hypertension used loose and strict criteria to determine adherence to STGs. The strict criteria required prescriptions to fully comply with the stipulations of the STGs, while the loose criteria allowed for some deviations in the dose and duration of treatment, non-use of generic names, and use of additional medicines, such as analgesics and multivitamins. The study reported overall compliance with the STGs in treatment of patients by 26.2% using strict criteria and 55.1% using loose criteria (44). Adherence to STGs in public health facilities in another study in Tanzania was slightly low 70.08% compared to the findings of this study (28).

Prescribers and dispensers at any time may require to consult references to remind them some issues related to services they provide like diagnosis, dosage, regimens, indications and drugs interaction. Prescribers are supposed to have a copy of STG when prescribing. Findings from this study showed that 72% of prescribers who reported to consult STGs as reference for clinical case management, about 65 % of them had copies of STG on their working desk/room and only 30% of them consult STG more often as basis for prescription (Figure 7). However some prescribers indicated to have reference documents in soft copy form in their Personal computers and others had proprietary books other than STGs.

The study findings indicate a better performance as compared to study in Nigeria where only 35% of the prescribers interviewed found to have copies of STGs and 29.7% of them reported to use them regularly in their clinical practices (54). The study in Namibia conducted in public health facilities reported between 37.5% - 83.3% of prescribers owned personal copies of STGs across the regions surveyed and prescribers between 20 – 66.7% used STGs frequently on daily basis (44). That was comparable to the present study that report 30 % of prescribers that have tendency to consult their STGs often.

It is evident from figure 8 that, only 35% of the prescribers interviewed reported to have attended in service training on rational use of medicines. Most of the respondents agreed

to have attended various in-service training from time to time but not about rational use of medicines. Hence these trainings are highly required. Respondents suggested improved access to STGs while other suggested supportive supervision, as the way toward improvement of use of STGs by prescribers and hence improved prescribing practice. Most of respondents reported to have been using feedback through daily morning report, short course trainings followed by availability and use of clinical guidelines. Involvement of Medicines and Therapeutic Committee (MTC) in monitoring drug use in health facilities was reported by few respondents (Table 8). It was noted that, almost all health facilities had established hospital therapeutic committees. They were functional, only that they were mostly engaged in activities other than promoting Rational Use of Medicines (RUM) like preparing budgets, reconciling purchased items and funds used and cross checking the drugs consignment brought in from MSD or other sources. Despite MTC of other health facilities, only the MTC of Mawenzi Hospital seemed to be involve actively in the aspect of promoting rational use of medicines, it was noted to have recently established Hospital drug formulary for local use. The document had been disseminated to prescribers and the pharmacy staffs.

Apart from STGs, prescribers do require to access other relevant reference materials. They are meant to be available at each health facilities or to each health care worker in order to provide for standardized guidance in making decisions about appropriate health care for specific disease conditions. Incidences of forgetting doses, regimens or diseases conditions are common. Drug toxicity, side effects, interactions and reactions need to be correctly known and taken care of. Results in table 9 show that, the availability of reference materials in health facilities surveyed was 51% .This value is considerably low. The availability of essential medicines in the referral regional health facilities of both public and faith based was fairly good. On average, 84% of 15 key medicines on the list was available at the health facility (Figure 4). This is higher than the overall average of 75% that was obtained in the study of baseline survey in Tanzania in 2002 and 79% of in-depth assessment of medicine supplies in Tanzania in 2008 (59). The study in Tanga-Tanzania reported 73.4% an average availability of tracer medicines at zonal medical stores (28). Since the capacity of MSD to supply all essential medicines is not to optimal, these findings could be explained by individual health facility efforts and strategies to

acquire essential medicines through various sources, using self-generated funds like CHF, NHIF and Revolving drug Funds .

4.4 Spectrum of skin diseases of Patients for the studied Health Facilities

Skin diseases have become significant health problem in Tanzania as in many other developing countries. Available data from the routine Health Management Information System (HMIS) 2011 (Table 1), suggests that skin diseases constitute a substantial number of outpatient attendances for people of all ages but more prominent for children of under 5 years (12). The monitoring trends in the frequency and type of referrals to dermatology out-patient clinics are important for decision making and in predicting the future developments of health service. Based on clinical diagnosis by dermatologist and general practitioners, the patterns of skin diseases observed in this study comprised of Infectious dermatoses and Noninfectious dermatoses. Non-infectious disorders constituted 63.8 % of all skin disorders, whereas infectious disorders constituted 36.2 % (Table 13). Furthermore the difference in the distribution of total dermatoses amongst male and female was statistically significant. These findings are similar to the study in Saudi Arabia where non-infectious dermatoses were present in 69.8% and infectious dermatoses present in 28.6% (60), in India, in Anand District infectious and non-infectious was 18.14% and 79.60% (61) respectively. Studies in Tanzania also, reported 57.3% and 30.4% of infectious and non-infectious skin dermatoses respectively (26). In many previous studies infectious dermatoses were reported to comprise almost one third of all skin disorders. These findings are similar to the findings reported in this study. Results obtained in this study are contrary to those of a study in Nigeria by Olayinka (62), who reported infective skin disorders to present with the largest part 32.5% followed by non-infective dermatoses with 25% (62).

The findings of this study showed that the commonly occurring five dermatological disorders among the top ten skin diseases were bacteria skin infection (pyoderma) 19%, atopic dermatitis, 15%, fungal infection 12%, acne vulgaris 8.4% and allergic contact dermatitis 8.4% (Table 12). Pyoderma, dermatitis (atopic dermatitis, contact dermatitis) fungal and acne were the most commonly encountered skin diseases in previous studies conducted in Tanzania, Nigeria, India and Turkey (26, 62, 63).

Bacterial infection presented with cellulitis, impetigo, folliculitis, erythrasma and DCPA, Superficial fungal infection presented with candidiasis, tinea corporis, tinea versicolor, tinea capitis and tinea unguium. Similar results were obtained by Komba (26), in his study in Dar es salaam reported the common infectious dermatoses were pyoderma, pediculosis, capitis, pityriasis versicolor, tinea pedis, tinea capitis, tropical folliculitis and ulcers. Parasitic skin infection scabies found to occur as low as 3% among all total dermatoses (Table 10), the low prevalence of scabies could probably be due to decreased overcrowding especially at night and increased supply of clean water.

Of all the top ten skin diseases, the difference in the distribution among females and males was statistical significant $P = 0.002$. So the disease patterns observed in this study were of unequal distribution between genders. The females were more likely to contract skin disorders than male, this probably because females tend to seek medical care about their skin than their males counter parts, so they therefore present to OPD skin clinic in relatively high proportion. From table 2, the highest rate of skin disease by age was observed in the age groups between 11-20, and 21-30. Atopic dermatitis and contact dermatitis were seen more in females than males, fungal more in male than female and acne was found in equal distribution in age group of 11-20 and 21-30 yrs. Atopic dermatitis were more in children while contact dermatitis was observed more among adults' patients, this could be work related exposure or self-treatment with various skin remedies as these groups represent workers and school students age, are prone to the risk factors such as nature of occupation, involving more in physical activities with risk for contact skin irritants.

Pyoderma was predominant among the top ten skin diseases, a hot climate especially where hot humid atmosphere prevail can be a predisposing factor to development of the disease (64). In Colombia, the prevalence of streptococcal pyoderma in children was found to increase as the weather became hotter and more humid 12.2% in the subtropical zone and 26.8% in the tropical (65). Similarly a study once done in Tanzania showed that a high incidence of pyoderma was related to hot and damp coastal weather, poor hygiene (difficulties in access to water) and overcrowding with intimate personal contact (65). Tanzania being located in warm and tropical climate region, especially the Coast Region

we can expect high prevalence of the disease occurring among the community of poor social economic status and living in unhygienic conditions.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study observed the spectrum of skin diseases and drug prescribing practices in dermatological outpatients of Regional Referral Hospitals in public and faith based organizations in three regions of Tanzania which were Morogoro, Dar es salaam and Kilimanjaro. The study deployed WHO/INRUD core drug prescribing and health facility indicators. The findings suggested that, the health facilities did well on 4 indicators out of 7. These were average number of drugs prescribed per encounters (2.1), encounters with injection prescribed (5%), availability of key drugs in stock (84%) and percent of drug prescribed from EML (85%). The 3 poorly performed indicators, were percent of encounter with antibiotics (38%), percent of drugs prescribed by generic name (75%), this was considerably low since generic prescribing above 80% is considered satisfactory, and percent availability of STGs & EML among prescribers (65%). Adherence of prescribers to STGs to treat patient varied considerably between Health facilities where public Health facilities did well as compared to faith based health facilities.

Prescribing practices need to be improved regularly through continuing medical education. Few prescribers and pharmacy staff had attended in service training in rational use of drugs. The study results suggest that continuing education on rational drug use is extremely lacking. The use and availability of STGs among OPD prescribers were considerably low.

In regards to Skin disease profile, the study has revealed that pyoderma, dermatitis variants, superficial mycoses, acne vulgaris and urticaria are the most leading causes of skin diseases in the referral hospitals surveyed. The study has provided a profile and frequency of skin diseases encountered among the patients who attended outpatient dermatological clinic.

5.2 Recommendations

On the basis of the findings of this study, the following recommendations are made:

- Continuous education on rational prescribing of antibiotics and generic should be given to the prescribers of both public and faith based health facilities.
- Improve adherence to STGs and EML by ensuring functioning of Hospital and Medicines Therapeutic committee.
- Ensure that Tanzania STG and EML copies are sufficiently available at Health Facilities
- Pharmaceutical supply system should be strengthened to ensure sufficient availability of essential and generic formulation medications.
- Encourage medical colleges to recruit more candidates in dermatology specialty while improving clinical practices of general practitioners through short courses and in-service trainings.

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7.0 Appendices

7.1 Appendix I: Questionnaire for Prescriber on Utilization of STG

Survey Questionnaire

The questionnaire for the OPD prescribers and pharmaceutical personnel on the availability and utilization of Standard treatment guidelines and essential medicine list

No.	Question	Tick the correct response	Skip to
1.0	Background Information:		
1.1	Name of the Health facility		
1.2	Ownership of Health facility	(a) Public ____ (b) Faith Based ____	
1.3	Gender	(a) Male ____ (b) Female ____	
1.4	Academic qualifications	Masters, Degree, Advanced diploma, Diploma, Certificate, None,	
1.5	Profession	Dermatologist, MD, AMO, Co, Nursing officer, Pharmacist.....	
1.6	Duration of profession practice How long have you been prescribing?	(a) 1-2 years () (b) 3 years () (c) >4 years ()	
1.7	Have you come across skin diseases in your clinical practices?	(a) Yes () (b) No ()	
1.8	If the response to qn 1.7 is yes, what are the common skin diseases encountered?	
2.0	Availability of STGs at health facilities		
2.1	Do you have any copy of STG in your working room/desk?	(a) Yes () (b) No. ()	
3.0	Utilization of STG among prescribers as basis for prescription		
3.1	Do you consult clinical guidelines in your day to day clinical case management as a Reference?	a) Yes () (b) No ()	

3.2	If yes, How often do you consult it ?	(a) More often () (b) Rarely () (c) Whenever required ()	
3.3	If you use it more often, why ?	(a) It helps to remind some issues () (b) Any other reason_____	
3.4	If no to question no 3.1, why ?	(a) You do not understand it () (b) The knowledge you have is enough () (c) You do not have time to do that () (d) Any other reason.....	
3.5	If you use it rarely, why?	(a) it is not clear () (b) you do not have your own copy () (c) The knowledge you have is enough () (d) You do not have time to do that () (e) Any other reason.....	
3.6	Strategies to improve prescribing practices		
3.6.1	Which of the following is being used by your institution?		
	(a) Short course training	(a) Yes (b) No	
	(b) Availability and use of clinical guidelines	(a) Yes (b) No	
	(c) Prescribing restriction by HTC	(a) Yes (b) No	
	(d) Feedback through daily morning report	(a) Yes (b) No	
	(e) Any other reasons, explain.....		
3.7	Being prescriber/nursing officer/pharmaceutical Have you attended in service training in rational use of medicines?	a) Yes (b) No	
3.8	If yes in response 3.7 above, when?	(a) Recently (past few months) (b) Past one year (c) More than two years ago	
4.0	Thank You For Your Time		

7.2 Appendix II: Dodoso kwa Madaktari Juu Matumizi ya Miongozo

Dodoso la Utafiti

Dodoso kwa madaktari juu ya upatikanaji na matumizi ya Miongozo ya Matibabu (STGs) kwa Madaktari wa Kitengo cha matibabu cha Nje OPD

No.	Maswali	Sehemu ya majibu	Nenda
1.0	Taarifa za jumla :		
1.1	Jina la Kituo/Hospitali		
1.2	Umiliki wa kituo	(a) Hospitali ya Umma (b) Mashirika ya dini	
1.3	Jinsia	(a) Me (b) .Ke	
1.4	Kiwango Cha Elimu	Shahada ya Uzamili, Shahada ya kwanza, Diploma ya juu,Diploma, Cheti, Hakuna,	
1.5	Taaluma	Dermatologist, daktari, Daktari msaidizi- AMO, Mganga-Co,Nursing Officer,Mfamasia...	
1.6	Muda uliodumu katika Taaluma Ni kwa muda gani umedumu katika kutoa matibabu ?	a) mwaka 1-2 () b) Miaka 3 () c) Zaidi ya miaka 4 ()	
1.7	Katika wagonjwa unao wahudumia, je umewahi kutibu magonjwa ya ngozi ?	a) Ndio () b) Hapana ()	
1.8	Kama jibu ni Ndio kwa swali hapo juu 1.7, ni magonjwa gani ya ngozi unakutana nayo mara kwa mara ?	
2.0	Uwepo wa Nakala za Miongozo wa Matibabu (STGs) Katika Kituo/Hospitali		
2.1	Unayo nakala ya STG ktk chumba chako cha kazi/kabatini ?	a) Ndio () b) Hapana ()	
3.0	Matumizi ya STG miongoni mwa Waganga/Madaktari katika uandishi wa cheti cha dawa		

3.1	Unatumia STG ktk kuandika dawa na kuhudumia wagonjwa kila siku/mara kwa mara kama kumbukumbu rejea ?	a) Ndio () b) Hapana ()	
3.2	Ni kwa kiasi gani unatumia STG?	(a) Mara nyingi () (b) Mara chache () (c) Inapohitajika ()	
3.3	Unafikiri kwa nini unahitaji kutumia STGs?	(a) Inasaidia kukumbuka baadhi ya vitu () (b) Sababu nyinginezo _____	
3.4	Kama jibu ni hapana katika swali 3.1, kwa nini ?	(a) STGs haieleweki () (b) Elimu uliyonayo inakutosha () (c) Huna muda wa kukisoma () (d) Sababu nyinginezo.....	
3.5	Kama unakitumia mara chache, kwa nini ?	(a) STG haieleweki () (b) Huna nakala ya STG () (c) Elimu uliyonayo inatosha () (d) Huna muda wa kusoma STGs () (e) Sababu nyinginezo.....	
3.6	Mkakati wa kuboresha uandikaji wa dawa za cheti		
3.6.1	Upi/ipi mioangoni mwa mikakati ifuatayo inatumika na kituo chako ?		
	(a) Semina/mafunzo mafupi	(a) Ndio (b) Hapana	
	(b) Matumizi ya miogozo	(a) Ndio (b) Hapana	
	(c) Ufuatiliaji matumizi na kamati ya matibabu ya (d) hospitali (HTC)	(a) Ndio (b) Hapana	
	(e) Kupitia vikao vya asubuhi-clinical meeting	(a) Ndio (b) Hapana	
	(f) Nyinginezo,elezea.....		
3.7	Umewahi udhuria mafunzo kazini juu ya matumizi bora ya dawa ?	(a) Ndio (b) Hapana	
3.8	Kama jibu hapo juu 3.7 ni Ndio, lini...?	(a) Hivi karibuni (miezi michache iliyopita) (b) Mwaku mmoja ulopita (c) Zaidi ya miaka miwili ilopita	
4.0	ASANTE KWA KUSHIRIKI		

7.3 Appendix III: Observational Checklist

Table 2 General Checklist	
Name of Health facility :	Location :
Ownership of the health facilities:	Public _____ Faith based _____
Investigator _____	Contact _____
Qualification of Interviewee: Dermatologist _____	General Practitioner _____
Clinical Officer _____	Pharmacist _____ Nurse _____ Other _____
Who prescribes to the Patient with skin diseases?	
Does health facility have special OPD dermatological unity? Yes ___ No ___	
<ul style="list-style-type: none"> • Presence of STGs: 	
1. Presence of any STG	Yes.....No.....
2. If yes, how many copies?.....	
3. If yes, which edition(s)? 2007.....2013.....	
4. Where is it located, in the shelves.....on prescribers' desk.....	
5. Availability of 15 Key essential medicines in Health facilities	
OPD –Opd register/Prescription/Patient file	
1. Total number of Patients attended General Outpatient department at this HF.....	
2. Total number of patient among GOPD are of skin disorders at this HF.....	
3. Disease diagnosed	Prescription no.....
4. Medicines prescribed.....	
5. Medicines supposed to be prescribed according to STG 2007/2013.....	

7.4 Appendix IV: Informed Consent Agreement Form



STUDY TITLE: Spectrum of Skin diseases and drug prescribing pattern among out patients in public and faith based Hospitals in three regions of Tanzania.

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Greetings!

In partial fulfillment of a Master of Science in Pharmaceutical Management, it is a prerequisite to undertake and submit a dissertation on chosen problem topic. The above named study intends to investigate prescribing practices in dermatological disorders among public attending OPD in public and private health facilities. The study will reveal the situation and provide data that will rectify shortfalls in the prescribing practices.

Study information and Your Participation

The investigator would like to request your voluntary participation in this study where on one part you will be asked to fill in questionnaire responding to questions related to availability and utilization of standard treatment guidelines and EML. On the other part Outpatient treatment registers, Patient file, cards or copy of NHIF claim form retained at your facilities will be checked to obtain prescribing data relating to skin diseases drugs prescribed and the diagnosis made.

The final copy of the dissertation will be sent to each respective health facility after approval from Muhimbili University of Health and Allied sciences. I guarantee that the information will be treated with strict confidence.

Rights to Withdraw and Alternatives

Taking part in this study is completely voluntary. If you choose not to participate in the study or if you decide to stop participating in the study will not affect your good relationship with the investigator. You can stop participating in this study at any time, even if you have already given your consent and if for any reason you would wish to come back into the study after withdrawal, we will

be ready to accept you to continue with the study. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Compensation

The study will Not provide any payment for anyone participating in the study.

Who to Contact

If you ever have questions relating to this study, you should contact the above addressed personals.

Your rights as a Participant

This research has been reviewed and approved by the IRB of Muhimbili University of Health and Allied Sciences. An IRB is a committee that reviews research studies in order to help protect participants. If you have any questions about your rights as a research participant you may contact Prof. Mainen Moshi, Chairman of the College Research and Publications Committee, P.O Box 65001, Dar-es-salaam, Tel: 2150302-6.

Also you may contact the following persons for help :

Mr Deogratias Rweyemamu; mob 0754 444 545

Prof Mary Justin Temu ; mob 0768 023 787

Dr. Debora K.B Runyoro ; mob 0716 492529

Do you agree to participate? Tick the appropriate alternatives for your decision:

Yes.....NO.....

I, _____ have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of investigator _____

Date of signed consent _____

7.5 Appendix V: Informed Consent Form (Swahili Version)

Fomu ya Ridhaa Kushiriki katika Utafiti



Jina la Utafiti : Uchunguzi juu ya magonjwa na matumizi ya dawa miongoni mwa wagojwa wanje (kutwa) Wenye matatizo ya magonjwa ya ngozi katika Hospitali za rufaa za Umma na zile za Mashirika ya Dini.

MTAFITI MKUU : Deogratias Rweyemamu
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Ndg Salaam !

Kufanya utafiti juu ya matatizo au mapungufu katika maeneo mbali mbali utoaji wa uduma za afya ni mojawapo ya hitaji muhimu katika kuitimu masomo ya udhamili “Msc Pharmaceutical management,” Utafiti tajwa hapo juu unalenga kukusanya taarifa juu ya wagojwa wa nje, OPD juu ya matumizi ya dawa za kutibu magonjwa mbalimbali ya ngozi katika hospitali za umma na za mashirika ya dini.Matokeo ya utafiti huu yatumika kugundua mapungufu,matatizo na visababishi vinavyopelekea uandikaji,utoaji na matumizi ya dawa yasiyo sahihi na kupata ufumbuzi.

Maelezo ya utafiti na Ushiriki wako.

Mtafiti anakaribisha ushiriki wako wa hiari katika utafiti huu ambapo kwa upande mmoja utatakiwa kujaza dodoso lenye maswali kuhusiana na upatikanaji na utumiaji wa miongaozo kama”standard treatment guidelines na EML”. Kwa upande mwingine mtafiti atahitaji kuona na kupitia kumbukumbu kama Outpatient treatment registers,faili la mgonjwa, cards au copy za NHIF claim form zilizopo kituoni kwako kupata taarifa za magojwa ya ngozi yaliyobainishwa na dawa zilizo andikwa kutumika kwa mgonjwa.

Nakala ya taarifa kamili ya utafiti huu itatumwa hospitalini baada ya kuwa imeidhinishwa na kupata kibali kutoka Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili. Taarifa utakazo toa katika utafiti huu ni siri hazitatolewa kwa mtu mwingine au taasisi isiyohusika.

Haki ya kukataa au kujitoa kushiriki

Fahamu kuwa kushiriki kwako katika utafiti huu ni kwa hiari yako mwenyewe. Kama ukichagua kutoshiriki katika utafiti huu au kama ukiamua kutoendelea kushiriki hakuna adhabu yoyote itakayo kupata na pia hutopoteza haki zako zozote ambazo ulitakiwa uzipate kama mshiriki. Unaruhusiwa kusitisha kuendelea kushiriki wakati wowote utafiti unapoendelea kama unasababu yoyote kufanya hivyo. Pia unaruhusiwa kurejea kuendelea kushiriki katika utafiti hata kama mwanzoni uliwahi kusitisha na kuacha. Tutakuwa tayari kukupokea ili urejeapo uweze kuendelea kushiriki katika utafiti.

Fidia au Malipo

Ushiriki wako katika utafiti huu ni wa hiari hivyo hakuna Malipo yoyote itakayo tolewa .

Haki zako kama mshiriki:

Utafiti huu umepitiwa na kuidhinishwa na jopo la Kamati ya Utafiti na Machapisho ya Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili. Kama utakuwa na swali au maswali kuhusu haki zako kama mshiriki katika utafiti huu wasiliana na Profesa Mainen Moshi, Mwenyekiti wa Kamati ya Utafiti na Uchapishaji-MUHAS, S.L.P 65001, Dar es salaam. Simu Na : 2150302-6. Pia kwa msaada zaidi au tatizo lolote unaweza kuwasiliana na :

Mr Deogratias Rweyemamu; mob 0754 444 545

Prof Mary Justin Temu ; mob 0768 023 787

Dr. Debora K.B Runyoro ; mob 0716 492529

Je, Unakubali kushiriki ? Weka tiki kwenye ndio au hapana

Ndio.....Hapana.....

Mimi, _____ nimesoma na kuelewa fomu hii ya makubaliano. Maswali yangu yamejibiwa. Nimekubali kushiriki katika utafiti.

Sahihi ya mshiriki _____

Sahihi ya Mtafiti _____

Tarehe ya kusaini makubaliano _____

7.6 Appendix VI: Simple Prescribing Indicator Form

Health Facility..... Investigator.....Date.....

SN	Diagnosis	Sex m/f	Age Yrs	Drug Prescribed	Antibiotics Encounter	# Generic	#Drug per Prescription	Route admin	#Drug on EML
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									

Note : *0=No 1 7.7 Appendix VII: Facility Summary Form

7.7 Appendix VII: Facility Summary Form

Location _____

Date _____

Contact : _____

Problems or

Comments _____

Cases : Retrospective _____ Covering dates _____ to _____

Prospective _____ Covering dates _____ to _____

Patient Care _____ Covering dates _____ to _____

Essential drug list/Formulary available at facility? (0/1) _____

Key Drugs in stock to treat important disease conditions In stock(0/1)

Key Drugs in stock to treat important disease conditions	In stock(0/1)	% in stock this facility
1. ALU Tabs	_____	
2. Amoxicillin caps	_____	
3. Cotrimoxazole tab	_____	<input type="text" value=""/>
4. Salbutamol	_____	
5. Tetracycline eye ointment	_____	
6. Gentamicin 20mg/ml 2ml	_____	
7. Oral rehydration salts	_____	
8. Mabendazole tablets	_____	
9. Quinine tab/inj	_____	
10. Hydrocortisone cream	_____	
11. Benzoic acid + Salicylic acid.	_____	
12. Ferrous salts+ Folic acid	_____	
13. Acetyl Salicylic acid or Paracetamol tab	_____	
14. Cough Syrup	_____	
15. Povidone Iodine/gentian violet	_____	