PREVALENCE AND AWARENESS OF DERMATOLOGICAL DISORDERS AMONG PATIENTS ADMITTED TO MEDICAL WARDS AT MUHIMBILI NATIONAL HOSPITAL IN DAR ES SALAAM, TANZANIA.

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Medicine (Internal Medicine) of the Muhimbili University of Health and Allied Sciences

May, 2009

CERTIFICATION

The undersigned certify that he has read and hereby recommend for submission a dissertation entitled: **"Prevalence and awareness of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital in Dar es Salaam, Tanzania",** in partial fulfillment of the requirements for the degree of Master of Medicine (Internal Medicine) of the Muhimbili University of Health and Allied Sciences.

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DECLARATION

I, Pauline Chale hereby declare that, this dissertation is my original work and has not been accepted for a similar degree in any other university.

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DEDICATION

I dedicate this work to my parents, Mr. and Mrs. N.F. Chale, the founders of my education. I also dedicate this work to my sisters Jacqueline and Pelegrina, and to my brothers Pamphili-Richard and Ferdinand. Special dedication to my nephews Nicodemus and Erwin, and to my nieces Dionisya-Catherine and Grace.

ABSTRACT

Background: In developing countries, dermatological disorders are commonly encountered in communities and in clinical practices, with prevalence ranging from 20% to 80%. In Sub-Saharan African countries including Tanzania, the burden of skin diseases is underestimated in most health authorities. Many previous studies were community-based and very little was done among admitted patients. The attitude of regarding skin diseases as benign conditions may affect patients' as well as health workers' awareness and attention on skin diseases.

Objectives: To determine the prevalence and awareness of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital in Dar es Salaam, Tanzania.

Study design and settings: A hospital-based descriptive cross sectional study conducted among patients admitted to medical wards at Muhimbili National Hospital.

Materials and Methods: Patients were consecutively recruited from the admitting male and female medical wards. Patients or parental/guardian written consent was sought to fulfill their willingness to participate. During interview, direct questioning was used to assess patients' awareness on dermatological disorders. Patients were asked for the presence of any dermatological problems, the associated symptoms, their distribution and how they were managed. Complete dermatological examination was done to all enrolled patients by the author, regardless of their response on presence or absence of dermatological disorders. The assessment of the lesions was done based on their distribution, pattern and morphological features. Dermatological diagnoses were made

based on observed clinical features and in difficult cases, dermatological diagnoses were made with the assistance of a consultant dermatologist who was the supervisor of the study.

Specimens from skin scrapings, hairs, nails were subjected for microscopic examination for fungal elements after being prepared with potassium hydroxide. Fungal identification by colonial growth and biochemical testing were done after 14 days of culture on Sabouraud's Dextrose agar. For suspected bacterial infections, all specimens were subjected for Gram staining and then cultured on Blood and MacConkey agar plates. Twenty-four hours later, bacterial identification by colonial growths and biochemical testing were done. Histopathological investigations were done to confirm malignancy. Mite infestations were confirmed microscopically.

Results: Three hundred and ninety patients were enrolled into the study, of whom 221(57%) were females. The mean age was 36.7±17.9 (range 7-84 years). The overall point prevalence of one or more dermatological disorders was 60%. Of those studied, dermatological disorders were common in males (65%); young adults aged 18-44 years were mostly affected. When all forms of dermatological disorders were considered, fungal infections (30%) were the leading diagnosis. Inflammatory conditions (23%), viral infections (9%) and neoplasms (5%) were commonly associated with HIV diseases. Other important dermatological disorders were bacterial infections (12%), infestations (2%), autoimmune diseases (2%) and miscellaneous conditions (31%). Both referring medical practitioners and admitting doctors of Muhimbili National Hospital rarely documented dermatological disorders as primary or additional diagnosis. The majority of

the patients (55%) were not aware of the dermatological disorders. However, probing increased the sensitivity (51%) of identifying dermatological disorders compared to spontaneous complaint.

Conclusions and recommendations: The study shows that, dermatological disorders are common among admitted patients and more than half of the patients were not aware of them. Basic dermatological education is important to improve knowledge and awareness on dermatological disorders to both patients and health care workers at primary and secondary health care levels.

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ABBREVIATIONS

AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
BBE	Benzyl Benzoate Emulsion
ESR	Erythrocyte Sedimentation Rate
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HCV	Hepatitis C Virus
ICU	Intensive Care Unit
IgE	Immunoglobin E
ILDS	International League of Dermatological Societies
K.S	Kaposi's sarcoma
KOH	Potassium Hydroxide
MNH	Muhimbili National hospital
MUHAS	Muhimbili University of Health and Allied sciences
NSAIDs	Non-Steroidal Antiinflammatory Drugs
NIMR	National Institute of Medical Research
PCR	Polymerase Chain Reaction
PPE	Pruritic Papular Eruption
QoL	Quality of Life
SCC	Squamous Cell Carcinoma

SDA	Sabouraud Dextrose Agar
SJS	Steven Johnson Syndrome
TEN	Toxic Epidermal Necrolysis
U.S	United State
U.K	United Kingdom
WHO	World Health Organization
ZN-stain	Ziehl-Neelsen stain

1.0 INTRODUCTION AND LITERATURE REVIEW

1.1 Background

The skin is the largest organ of the human body, covering an area of approximately $2m^2$ and accounting for 16% of adult body weight. It has three layers, which help in maintaining essential body functions like protection from microbes and other harmful external influences; sensory functions; regulation of body temperature and maintaining fluid homeostasis.[1,2] The skin can show signs of internal diseases and is an important marker for common changes associated with aging, nutritional deficiencies, underlying immunosuppression as well as racial discrimination.[2,3]

Skin diseases were reported to affect a reasonable number of patients in tropical communities of the developing countries. [4] Despite this, most of the communities regard skin diseases as benign conditions. Many health authorities are lacking rational control measures for the skin diseases.[4, 5] Therefore; less attention allows most of the skin diseases to run a chronic course among the sufferers with significant detrimental impact on the quality of life.

1.2 Epidemiology and prevalence of dermatological disorders

Skin diseases are extraordinarily diverse in clinical presentation, severity and epidemiology. The overall prevalence of skin diseases in population-based studies conducted throughout the world varies from 14% to 50%.[6] Skin diseases have been

reported to affect all age groups of both sexes; however, children are more vulnerable and extensively studied worldwide. [4, 6 7, 8]

The first epidemiological reports in dermatology can be traced as far back as 1746 when James Lind related scurvy in sailors with dietary factors. Furthermore, Joseph Gold Berger 1910 in Georgia State sanatorium observed that, patients admitted to hospital developed pellagra and he suggested that it was due to the absence of essential vitamins.[6]

In the developed world, previous studies of 1970's reported inflammatory dermatological diseases to be the most commonly diagnosed skin conditions.[6] Recently in the developed world, life style and regional variations especially industrialization are reported to affect the pattern and magnitude of dermatological diseases. In outpatient departments of industrialized countries, contact dermatitis accounts for about 5% of dermatological consultations while skin malignances keep on increasing.[6, 9, 10]

A recent publications of 2004, reported skin diseases to be among the top 15 diseases in the United States of America, with one out of every three people suffering from at least one active skin condition. These dermatological disorders were reported to increase health care spending between 1987 and 2000. The highly prevalent dermatological disorders identified include contact dermatitis (47%), atopic dermatitis (59%), and skin malignancies (34%). [9, 10, 11] Herpes simplex and human papilloma virus infections remain common in HIV-infected patients as opportunistic skin manifestations.[12]

In the United Kingdom, skin diseases comprise about 22.5% of general attendances in inner city hospitals. [10] Approximately, 20% of British children have atopic eczema by the age of four, psoriasis affects about 3% of the population, and skin cancers are reported to be the most common malignancies in the white-skinned UK population.[10,13]

In developing countries, most of the community-based surveys reported skin diseases to be one of the most frequent causes of morbidity. The overall prevalence of skin diseases in communities of developing countries ranges from 20% to 80%. Predominant skin diseases found in these communities result from infections and infestations such as superficial mycoses, scabies and pyoderma. HIV related skin diseases are also common.[4, 5, 6, 7, 8, 14, 15]

In Nepal, Walker et al documented that, skin problems were the commonest reasons for primary health care attendances. The overall point prevalence of skin diseases was 62%, with a wide range of dermatoses. The most prevalent were dermatophytes (11%), pityriasis versicolor (9%), acne (7%) and eczema (6%).[16]

A study done in rural Assiut Egypt, reported a point prevalence of skin diseases of 86%, with younger age group reported to be commonly affected, having one or more skin conditions. The highest proportion was occupied by infestations (27%), followed by eczema (20%), pigmentary disorders (18%), fungal infections (16%), bacterial (10%) and acne vulgaris (5%).[17]

Another survey among 254 randomly selected households of two villages in Ngara district of Northwest Tanzania revealed a point prevalence of skin diseases of 26.9%. Infectious skin diseases comprised the bulk (73.9%) with the younger age groups being affected most. [18]

1.3 Risk factors for dermatological disorders

The well-studied predisposing risk factors for dermatological syndromes; climatic factors, low socioeconomic status, overcrowding, poor hygienic standards and low levels of literacy, have been reported to influence the magnitude, pattern and distribution of dermatological diseases in any community. [4, 5,6,7,8]

One population survey done in Brazil showed that, infestation with *Tunga penetrans* is endemic in low socioeconomic communities. The prevalence of *Tunga penetrans* ranges from 34% to 54% between rainy and dry seasons of the year. [18] The burden of *Tunga penetrans* was further reported to affect many parts of Latin America and Caribbean for many years. Data available from Nigeria, Trinidad and Tobago, suggest that between 16% and 55% of their population were affected with Tungiasis.[19]

In the third world communities, scabies was reported recently to be a global health problem commonly among children and females. Importantly, scabies was associated with poverty and overcrowding; and its morbidity was reported to be underestimated.[7, 8, 20] The prevalence of scabies varies widely in different countries; and has been reported

as 30% to 65 %(India); 25 %(Australia); 8 %(Brazil); 18% (Kenya); and 6% to 7% in Tanzania. [20, 21,22,23,24]

A significant seasonal trend of skin diseases is also common amongst dermatology outpatients in Nepal. The majority (28.6%) of the visits was in spring season, followed by summer, winter and autumn. The three most commonly diagnosed dermatological syndromes were fungal infections, acne and melasma.[25]

A similar pattern of diagnoses has been reported in Tunisia. A study to determine the spectrum of skin diseases based on outpatient population revealed more than 50% of skin diseases to be of infectious origin. Fungal infections were top on the list, followed by viral and bacteria infections. Socioeconomic status and environmental factors like hot climate were reported to influence the magnitude of dermatological diseases. [26]

Similarly, Tanzania shows a mirror pattern of skin diseases. A study among 800 villagers in Southwestern Tanzania reported the prevalence of 34.7%. In this survey, patients were reported to have one or more skin diseases. Infectious and infestations diseases were common such as dermatophytes, bacterial and scabies. Other conditions were acne and eczema. [27] Another research to assess skin disorders and therapeutic needs among 820 primary school children at Ifakara rural Tanzania revealed that, 55% of the children had several skin disorders. The commonly encounterd conditions were dermatophyte, pityriasis versicolor, pyoderma, and scabies. [7]

In many parts of developing countries, preexisting dermatoses were reported to be the risk factors for skin diseases. Scabies have been reported as a major driving force of streptococcal pyoderma in children. In developing countries, the prevalence of scabies related pyoderma was reported to vary from 16% to 17%. [8, 20, 21, 28]

Certain occupations have been linked with occurrence of dermatological disorders. In industrialized countries, irritant contact dermatitis was commonly reported in individuals working in industries. [10, 29] Housewives, hair dressers and health care workers working at nursing homes, were reported to be more affected with fungal infections, hand dermatitis and xerosis due to continuously exposure to wet working activities and cleansing agents.[29,30,31]

Furthermore, other risk factors like co-morbidities, genetic and hormones can influence the occurrence of dermatological disorders. Although acne vulgaris were reported to be common among adolescent population of westernized societies, the susceptibility to development of acne vulgaris is determined by genetic and androgen hormone.[28, 32, 33] During recent years, development of acne vulgaris has been linked with high-glycemic load carbohydrate diets, which were reported to have androgenic effect.[32] These foods tend to induce hyperinsulinemia that enhances androgen synthesis and trigger follicular epithelial growth and hyperkeratinization.[32] Epidemiologically, high-glycemic load carbohydrate diets; pasta, white bread, sugar and refined cereals are commonly consumed by societies with westernized lifestyle than societies with nonwesternized rural lifestyle.[32]

1.4 HIV infection and dermatological disorders

A wide range of opportunistic dermatological disorders in HIV infected patients were reported to declined with the use of potent antiretroviral therapy.[12] These dermatological disorders have been reported as the first signs of the underlying HIV infection. Among patients with low CD4+ cell counts, either due to poor adherent or delayed starting antiretroviral therapy, the following dermatological disorders have been reported to be common; psoriasis, photodermatitis, prurigo nodularis, papular pruritic eruption (PPE), molluscum, and adverse drug reactions. [4,12,14,15]

Other dermatological disorders remain relatively common despite the use of adequate antiretroviral therapy; eczema, xerosis, warts, and Kaposi's sarcoma. In addition, Acne vulgaris, staphylococcal infections and Erythema nodosum were reported to have an association with immune reconstitution. [12, 14]

1.5 Dermatological disorders among admitted patients

Dermatology usually thought to be an outpatient speciality. Reports from many studies rarely mention dermatological disorders as a primary reason for admission. [34] There are few studies reporting on the pattern and prevalence of dermatological disorders among admitted patients. These studies almost shows a similar spectrum of dermatological disorders among admitted patients both in developing countries and developed world.[10, 34,35,36] Most of these studies reported life threatening acute dermatological disorders; Steven Johnson syndrome (SJS); toxic epidermal necrolysis (TEN) and autoimmune blistering diseases to be a common indication for admission. Furthermore, these studies

reported necrotizing fasciitis, leg ulcers, malignancies, eczema, psoriasis, candidosis and severe drug reactions to be the indication for admission based on extent, severity and accompany complications.[10, 35,]

One database in the United States reported relatively few admitted patients with a primary diagnosis of the skin diseases. These diseases are mainly from a small set of dermatological diseases, particularly skin ulcers, wounds, herpes zoster, and non-melanoma skin cancer.[10] Another clinical database from adult intensive care units (ICU) from England, Wales and Ireland, reported cellulitis, dermatological malignances, Steven Johnson syndrome and autoimmune blistering diseases to contribute about 0.5% of all ICU admissions.[34]

In developing countries, one inpatient study done in South Africa reported atopic dermatitis, psoriasis, severe drug reactions, leg ulcer, skin infections and bullous diseases to be the indications for admission in dermatological ward.[35]

Recently, the HIV pandemic has increased the number of hospital admission world wide. This has been associated with a wide range of dermatological syndromes. Kaposi's sarcoma, potentially life-threatening acute skin failure, extensive zoster and oropharyngeal candidosis and severe adverse drug reactions were reported to be the reasons for admission among HIV/AIDS patients and were associated with advanced disease.[4, 8, 36, 37, 38]

In Tanzania, a study among 305 adult patients admitted to medical wards of Muhimbili National hospital reported mucocutaneoud disorders to be common among HIV positive patients as compared to HIV negative patients. In this study, dermatological disorders were mentioned in 3% of the refferal forms of the patients as primary diagnosis or addition diagnosis pre admission. [36]

1.6 Awareness on dermatological disorders

Although awareness concerning underestimation of common skin diseases amongst health authorities in developing countries was reported to increase recently, the burden of dermatological diseases is still high.[5] World Health Organization's 2001 report on global burden of diseases address that, dermatological diseases were associated with mortality of 20,000 patients in Sub-Saharan Africa in 2001.[4]

In many parts of the world, health professionals were reported to be unaware of the burden of dermatological diseases. [4, 5, 39] The unawareness was related to low level of knowledge on dermatological disorders among both patients and clinicians. [5, 39] It was further reported that, communities' awareness could influence health-seeking behaviors, attitudes, beliefs, perceptions and patient's participations on treatment decision of dermatological diseases. [22, 39, 40, 41]

Furthermore, low level of knowledge on dermatological diseases accounts for the little attention given to these diseases.[4,5] A study among children in rural western Kenya had reported a decline in the prevalence of infectious dermatoses from 32.4% to 29.6%

particularly dermatophytes and tropical ulcers, after short training of primary health care workers. [23]

Mahe et al in Bamako Mali reported the similar finding, that, knowledge about skin diseases was poor and management practice were inadequate in most primary healthcare. After a short training program, the level of knowledge increased, diagnosis and treatment were appropriate, and this was accompanied by a total reduction in prescription costs by twenty five percent. [5]

In Brazil, data colleted from preventive screening campaign on non-melanotic skin cancer revealed that, people were not aware of the effect of unprotected sun exposure on non-melanotic skin cancers. Further report pointed out that, although skin malignant was frequent in Brazil, it was not the main complaint or reason for visiting the doctors. [39]

In western Ethiopia, Figueroa et al studied on dermatological diseases in two rural communities. Figueroa and colleague reported that, few members of those communities claim on dermatological symptoms, but upon examination, the majorities were found to have treatable dermatological conditions. [42]

1.7 Common dermatological disorders among admitted patients

From few available data, life threatening dermatological disorders were reported to be a major indication for hospital admissions. [34, 35] Overall, the extent, severity and complications associated with dermatological disorders were the major determinant for admission and spectrum of disease varies among admitted patients.

1.7.1 Infectious dermatoses

1.7.1.1 Fungal infections: Candidiasis is a mucocuteneous infection primarily due to yeast *Candida albicans*. It is common in tropics especially in patients with diabetes, malignancy, malnutrition, HIV/AIDS and pregnancy.[4,43] It mainly affects buccal mucosa, tongue, and corner of the mouth. Clinically appears as whitish cream, curd-like patches that can easily scraped off showing an erythematous base. Extensive oropharyngeal and gastrointestinal candidosis in debilitated conditions lead to dysphagia, loss of appetite, malabsoptions and diarrhoea hence nutritional deficiencies. Diagnosis is mainly clinically. Microscopically *Candida albicans* are gram positive and on Sabouraud dextrose agar, they are yeast cells. Patients respond well with azole antifungals. [4, 43,44,45,46]

1.7.1.2 Bacteria infections: Pyoderma describes a spectrum of skin and soft tissue infections caused by pyogenic bacteria, mainly *Streptococcus pyogenes* and *Staphylococcus aureus*. Pyoderma is common in the tropics, associated with poverty, poor hygiene and overcrowding. Infections occur mostly when protective mechanisms are lower due to excessive dryness, trauma, preexisting dermatoses, malnutrition and other debilitating conditions. [4,7,8,47,48]

In diabetic patients, minor foot ulcers due to trauma or tinea pedis may provide a portal of entry for *staphylococcus aures* and lead to septic ulcer or serious foot complications. In tropics countries patients with lymphatic filariasis of the limbs are at risk of cellulitis, which may lead to septic dissemination. For many years, younger children are commonly affected by S*treptococcal pyoderma* in most developing countries. Scabies is a major risk

factor for pyoderma. It was reported that reduction in prevalence of scabies lowers the prevalence of pyoderma. In addition, acute glomerulonephitis is the serious complication of S*treptococcal pyoderma.* [7,8,46,47,48,49]

Pyoderma can be diagnosed clinically and bacteriological culture done to confirm the organism. Topical antibacterials can be used in local disease, but systemic antibiotic is effective for extensive diseases. *Streptococcal pyogenes* is sensitive to penicillin and S*taphylococcal aureus* is sensitive to cloxacillin, however antimicrobial sensitivity test is a useful guide.[4, 45, 47]

1.7.1.3 Impetiginized eczema: Impetigo also commonly occurs because of secondary infections of the eczema. Patients with eczema are particularly susceptible as they carry heavy loads of *Staphylococcal aureus* on their skin and by scratching their skin permit entry of bacteria. These patients are susceptible to septicemia and Exfoliative erythrodermic dermatitis. Treatments should include systemic antibiotics, systemic corticosteroids, and supportive therapy like fluids and electrolytes especially in those with fulminant Exfoliative erythroderma. [43, 44,45,46,47]

1.7.1.4 Viral Infections: *Varicella zoster* virus causes herpes zoster (shingles) and Chicken pox (varicella). The individuals with immunosuppression like HIV infections, leukemia and malignant may have severe form of *varicella zoster* infection with disseminated bacterial superinfection. Herpes zoster manifested by acute painfully

multiple vesicular eruptions, distributed unilaterally along the affected dermatome commonly of the trunk or face.

Varicella occurs mainly in non-immune children, characterized by multiple vesicles and ulcerative lesions over the inflamed skin and mucous membranes. [43,44,45,46,467]

Diagnosis of *varicella zoster* infections is mainly clinical, but tissue culture, immunoflouresence antibody or PCR can be done if possible when the diagnosis is uncertain. Acyclovir topical or systemic is useful.[44, 45, 47]

1.7.2 Infestations: Scabies clinically presents with itchy papules associated with burrows, vesicles and pustules, especially on webs and sides of the fingers, wrists creases, axillae and genitalia. In immunosuppressed or chronically ill individuals, such as HIV infected patients, Crusted or Norwegian scabies may occur, this tends to have massive infestation of mites, with atypical extensive itching lesions, which are widespread and may be accompanied with septicemia secondary to pyogenic bacterial infections.[4,36, 43, 44]

Diagnosis of scabies is clinical, supported by opening of the burrows and looking for mites. Skin scraping can be done and microscopically examine for mite. Treatments for scabies are mainly topical with benzyl benzoate emulsion (BBE) and others like Lindane, if co-infected with bacteria a systemic antibiotic should be added.[4, 45, 47]

1.7.3 Non-infectious conditions

1.7.3.1 Psoriasis is chronic inflammatory skin disorder with exacerbation and remission course. The skin lesions are well-demarcated, large irregular plaques of various shapes, covered by silvery-white dry scales which when scraped off, exposed dermis show bleeding point (Auspitz's sign). Psoriasis can affect other part of the body particularly nails, joints and can be extensively affecting more than 10% of the skin especially in erythrodermic psoriasis. Genetic, environmental factors like upper respiratory tract infection, HIV infection and cold climatic conditions contribute to the pathogenesis of psoriasis.[12, 14, 43, 44, 46] Diagnosis is mainly clinical. Patients with extensively psoriasis involving more than 10% of the body should receive systemic therapy. Anti-inflammatory agents such as methotraxate; cyclosporine or biological agents like eternacepts, infliximub can be used.[45, 46, 50]

1.7.3.2 Seborrhoeic dermatitis is chronic dermatitis characterized by yellow – white greasy scales overlying erythematous patches or plaques. Commonly distributed in areas with rich supply of sebaceous glands namely the scalp, face (eyebrows, eyelashes, nasolabial folds), in and around the ears and upper trunk.[43, 44, 46] It occurs rarely in children and the elderly, but common in adolescents and middle-aged adults particularly in early HIV infection. *Pityrosporum ovale* and immunological mechanisms has a role in pathogenesis of this disease.[12, 14] Diagnosis is mainly clinical. Seborrhoeic dermatitis responds well with Ketoconazole antifungal and immunosuppressant agents like tacrolimus.[45, 46]

1.7.3.3 Drug Reactions

Mucocuteneous adverse drug reactions are most frequently produced by immunologic or non-immunologic mechanisms. Pathogenic mechanism may be through immunoglobulin IgE-dependent, mast cells/ basophils or activated complement-mediated immune response. Commonest drugs, which induce reactions, include antibiotics like penicillin and sulphonamides, highly active antiretroviral (HAART), Non-Steroid Anti-inflammatory drugs (NSAIDs), Chemotherapy and antimalaria. [2, 12, 14,44,45,46]

Viral infections, particularly HIV virus, increase risk of drug reactions through its alterations of immunologic mechanisms. About one third of HIV-infected patients who react to trimethoprim-sulfamethoxazole and ART drugs (nevirapine, abacavir) have low CD4+ count usually less than 50cell/uL. Drug may also cause exacerbation of preexisting dermatoses like acne, psoriasis or atopic dermatitis. [2, 12, 14, 45, 46]

Patients most commonly present with morbilliform or maculopapular rashes/eruptions often start on the trunk, pressure or trauma areas. It consists of erythematous macules and papules that are symmetric and may become confluent. Moderate to severe pruritus occurs and the eruption may involve mucous membranes, palms, and soles. Urticaria eruptions are among the most frequent types of cutaneous drugs reactions, characterized by pruritic, red wheals lesions that vary from a small point to large area along with morbilliform (or maculopapular) [2, 12, 14,44,45,46]

1.7.3.4 Erythema multiforme: an acute inflammation of skin and mucous membranes, characterized initially by erythematous macules and papules that may progress to vesicles and bullae. Lesions are found mainly in the distal extremities and face. The disease is thought to result from hypersensitivity reaction induced by various precipitating agents like infection with herpes simplex virus, HIV virus, mycoplasma pneumoniae and drugs sulphonamides and penicillin. Diagnosis is clinical and patients respond mainly to supportive therapies after stopping the offending drug and treat co-morbidities. [2,12, 14,44,45,46]

1.7.3.5 Steven Johnson syndrome is the severe bullous form of erythema multiforme, with multiple blisters and erosion on mucous membrane associated with fever. In toxic epidermal necrolysis, fever and diffuse widespread macular erythema precede large flaccid bullae, which rupture and result in loss of skin that may complicate sepsis and fluid and electrolyte problem. Diagnosis is clinically and patients respond to mainly supportive therapies after stopping the offending drug and treatment of co-morbidities. [2, 12, 14,44,45,46]

1.7.3.6 Autoimmune Bullous diseases

They result from inherited genetic defect or immunological events, which may be associated with systemic disease, trauma or friction. Pathologically result from the breaks in continuity within the epidermis or the dermal-epidermal junction, give rise to the formation of blisters; these include pemphigus, pemphigoid, erythema multiforme and others, which clinically, present with blisters or bullous, as the primary or predominant

lesions. Diagnoses are often clinical; histology and direct immunofluoresence are confirmatory and patients respond well with systemic corticosteroids, azathioprine or biological agents like rituximab. [2, 44, 45, 46]

Pemphigus vulgaris appears on previously normal or erythematous skin and mucous membranes. The primary skin blisters are flaccid, rupture easily and heal slowly. The lesions are non-pruritic, irregular and painful, usually on oral mucosa and scalp, which may become extensive, involved any mucous membranes. [2, 44, 45, 46]

Bullous Pemphigoid is the disease that has exacerbations and remission course. It mainly affects flexor aspects of extremities, lower abdomen and groin with less affect on mucous membrane. It usually starts with a prodromal urticuria or papular lesion that herald, by weeks or months, then sudden appearance of tense large bullous contain serum or blood stained fluid, which heals rapidly after rupture. [2, 44, 45, 46]

1.7.4 Neoplasms

Distribution of skin malignancy varies in different parts of the world and with race. The exposure to ultra violet radiation is the major risk factor in fairly skin population like Caucasian and albinos. Basal cell carcinoma is common among whites accounting for 70% -80%; occurs almost on sun-exposed area of face as nodulo-ulcerative lesion.[51, 52, 53] On the other hand, Melanoma is highly aggressive cutaneous malignancy accounting for 79% of all skin cancer death. It is highly prevalent in fairly skin of white and African Albinos. It appears in sun exposed parts head, trunk and legs. In black Africans, it is common in plantar in association to trauma. [40, 51, 52, 53]

Squamous cell carcinoma can develop anywhere on skin and mucous membrane appears as enlarged ulcerated area or as hard papule. Among black Africans, chronic skin ulcers and inflammation are major risk factors and has higher prevalence.[13, 51, 52]

Kaposi's sarcoma is common in HIV/AIDS patients with the worldwide prevalence of 35%. In Tanzania, Kaposi's sarcoma is the second dermatological malignancy after squamous cell carcinoma. Clinically, cutaneous nodulo-ulcerative lesions tend to involve lower extremities, especially the leg. The aggressive Kaposi sarcoma associated with HIV AIDS tends to be widespread involving the visceral and mucosal surfaces. [12, 13, 14, 51]

Neoplasms can be suspected, but tissue biopsy is necessary for histological diagnosis. Patients at early stage of skin malignancy can respond well to radiotherapy and/or systemic chemotherapy depends of type of neoplasm.[2, 44, 45, 46]

1.8. Dermatological manifestations of internal diseases

In primary health care centres of the developing countries, dermatological consultations account for 6% to 24% of a total visits. [5] Most of these health authorities have ignored skin diseases, despite being important signs or symptoms of underlying internal diseases. Skills relevant to the management of the skin diseases were reported to be low amongst most of the general health care workers in primary care settings.[2, 3, 4, 5, 53]

The majority of the patients attending at primary health care levels are lacking early opportunities for screening for serious internal diseases. Disorders that can be easily suspected through cutaneous symptoms and sign are chronic kidney disease, endocrine disorders, lymphomas, hepatitis, HIV infection and nutritional deficiencies.[2, 3, 46, 54]

Bernard and Karnath reported that, up to 50% of patients who have pruritus without obvious dermatological causes have systemic disorders commonly renal disease, cholestasis, hyperparathyroidism, lymphoma and others. These dermatological conditions may precede the manifestations of internal disease for several years. They further reported that, in patients with HIV/AIDS pruritus can be the first symptom or can result from accompany systemic diseases such liver disease, drug reactions, or lymphoma.[12, 13, 46, 54]

A study by Dervis and Serez in Turkey revealed that, pruritus was more frequent in patients with chronic hepatitis C infections (19%), followed by leucocytoclastic vasculitis and lichen planus. They documented different pathological mechanisms of pruritus, such as immune complex mechanism, autoantibodies induced inflammatory cascade and mechanical cause due to induced cholestasis. A chronic hepatitis C viral (HCV) infection was also associated with porphyria cutanea tarda, urticaria and others.[44, 46, 55,]

In nutritional deficiencies, patients can be presented with koilonychia, beef tongue and angular chelitis in iron deficiency; xerosis and pruritus in vitamin A deficiency; bleeding mucosa and gums in vitamin k and c deficiencies. Other cutaneous disorders that associate with internal diseases include scleroderma and lupus erythematosus, which are mainly seen in patients with connective tissue disorders. [43, 44, 46]

In general population, the worldwide prevalence of Vitiligo is reported to be low ranging from 1% to 4%. Vitiligo is an important skin disorders, because of cosmetic effects and its association with other autoimmune medical conditions; diabetes mellitus, pernicious anemia, Addison diseases, and thyroid disease. In addition, vitiligo has major impact on quality of life. [2, 3, 56, 57,]

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2.0 PROBLEM STATEMENT AND STUDY RATIONALE

2.1 Problem Statement

In Sub-Saharan African countries including Tanzania, skin diseases account for the highest prevalence (73.9%) among communicable diseases and have been reported to cause morbidity among communities. [5, 6]

Despite this burden, skin diseases are underestimated in most of the health services in developing countries and have not yet been regarded as important public health problem. Many previous studies were community-based and very little has been done among admitted patients.[4-8] Consequently, this lessens the attention and awareness of skin diseases among both health workers and patients.

In this regard, the opportunities of early screening for serious internal diseases that manifest with skin symptoms and signs tend to be lost. Patients remain with their suffering and report to hospitals at a very late stage of diseases. At these stages, treatments are often difficult and expensive; the quality of life is interfered with, and the burden on health services becomes enormous.

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2.2 Study Rationale

Reducing the burden of the skin diseases is important, as many tend to run a chronic course evading patients' and clinicians' awareness. Many communities in the developing countries recognize symptoms and signs of skin problems that seem to cause nuisance, like scabies, and ignore others which may not be associated with any disturbing signs or

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symptoms, although they may have serious morbidity or even mortality.[4] Some of these unnoticed dermatological disorders may be manifestation of serious internal diseases. In developing countries like Tanzania, the prevalence of dermatological disorders is reported to range from 20% to 80% among low socioeconomic communities.[4] Previous studies on skin diseases were community-based with very few being done among patients admitted to hospitals. Despite offering mass dermatological treatment services during the community-based dermatological surveys, such population-focused interventions have seldom achieved a significant reduction in the level of the burden of dermatological disorders.[4,8]

It was therefore important to conduct a study like this one as only few studies have been done among admitted patients in Tanzania. In addition, the study addresses the hidden picture on patient's awareness on dermatological disorders and provides the baseline data for future studies.

3.0 OBJECTIVES

3.1 Broad objective

To determine the prevalence and awareness of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital in Dar es Salaam, Tanzania.

3.2 Specific Objectives

1. To determine the prevalence of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital.
2. To determine the proportion of patients with dermatological disorders diagnosed at admission among patients admitted to medical wards at Muhimbili National Hospital.
3. To determine the proportion of dermatological disorders diagnosed by referring medical practitioners among patients referred for admission to the medical wards at Muhimbili National Hospital.
4. To determine the proportion of patients who were aware of their dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital.
5. To determine the proportion of patients with dermatological disorders coexisting with other medical conditions among patients admitted to medical wards at Muhimbili National Hospital.

6. To describe the pattern of coexistence between dermatological disorders and other medical conditions among patients admitted to medical wards at Muhimbili National Hospital.
7. To describe the commonly prescribed dermatological preparations to patients with dermatological disorders admitted to medical wards at Muhimbili National Hospital pre admission and at admission.

4.0 METHODOLOGY

4.1 Study design

This was a hospital-based cross sectional descriptive study.

4.2 Study setting

The study was conducted in the medical wards at Muhimbili National Hospital, which is the largest tertiary referral hospital in the country. Parallel to that, Muhimbili National Hospital is a teaching hospital for Muhimbili University of Health and Allied sciences (MUHAS), the largest medical school in the country. The hospital is located in the Eastern zone of Tanzania in the city of Dar es Salaam.

Dar es Salaam is the commercial city of Tanzania with an estimated population of about 3.5 million people (2002 census).The city has three district hospitals, namely Amana, Mwananyamala and Temeke. All these district hospitals, together with private hospitals around the city refer patients to Muhimbili National Hospital for tertiary medical care. Muhimbili National Hospital also functions as a secondary and sometimes as a primary medical care for patients around the city of Dar es Salaam.

4.3 Study population

All Patients admitted to the medical wards at Muhimbili National Hospital.

4.3.1 Inclusion criteria

Written consent obtained from patients or parent/guardian of children admitted to medical wards.

4.3.2 Exclusion criteria

Patients who were unconscious, mentally disabled, refused to give consent or parental/guardian unwillingness to participate.

4.4 Study duration

The duration of the study was between June and December 2008.

4.5 Sample size Estimation

The sample size was obtained using the following formula,

$$n = \frac{4p(100 - p)}{\varepsilon^2}$$

Where, n is the required sample size

ε, maximum likely error, is 5%

P, prevalence (42%).the prevalence of cutaneous manifestation among admitted patient in Tanzania. [36]

Thus, the minimum sample size for this study was 390 patients.

4.6 Sampling Technique

The patients were consecutively recruited from admitting male and female medical wards of Muhimbili National Hospital.

4.7 Data collection methods

4.7.1 Clinical work up

Patients were recruited daily from admitting medical wards by the researcher. Patients or parents/guardians were first explained on the study objectives, aims and investigations that were to be done to the enrolled patients. Patients or parental/guardians written consent was sought to fulfill the willingness for participation in this study.

All consented patients were interviewed for social demographic informations. Furthermore, patients were asked for the presence of any dermatological problems and their associated symptoms, distribution and management details for their skin disorders. Subsequently, all consented patients underwent a complete clinical dermatological evaluation, regardless of their response on presence or absence of dermatological disorders. The researcher performed clinical evaluation to each patient in bright/good light and under fully exposed skin and its appendages, while maintaining the patient's privacy.

The distribution, pattern and morphological features of the lesions were assessed. The lesions were described according to the nomenclature committee of the International League of Dermatological Societies (ILDS). Diagnoses of dermatological disorders were mainly based on clinical features. For the difficult cases, the clinical diagnoses were made under the assistance of a consultant dermatologist who was my supervisor. The researcher reviewed files and all gathered information was then recorded on specially designed data collection structured questionnaire (appendix I) designed for this study. Laboratory procedures were done to selected cases for confirmation when necessary.

4.7.2 Specimen's collection and Laboratory Procedures

The researcher followed universal precautions during collection and handling of the specimens. Specimens were obtained from skin, hair and nails, through scrapings, biopsy or swabbing of the lesions. Before obtaining the specimen, the entire site to be sampled was cleaned with 70% alcohol to remove the contaminants.

All specimens were sent to the main laboratory of Muhimbili National Hospital for bacteriological, mycological, parasitological or histopathologic studies under the assistance of a laboratory technologist/pathologist. Other routinely important investigations were done depending on patient admission diagnosis.

Bacteriological Samples

Swabs or aspirates from the lesions like wounds and abscesses, were collected and put in Stuarts transport media and then sent to the laboratory. Gram stain microscopic examination was done as appropriate. Subsequent specimens were then cultured on blood and Mac Conkey Agar plates. All cultures were incubated aerobically at 37°c for 24 hours. Examination of bacterial growth and identification of colonial morphologies was done, followed by biochemical tests such as catalase, coagulase, urease and DNase tests to confirm the organisms.

Mycological Samples

Specimens from suspected fungal infections were obtained from nails, hair and skin lesions. All specimens underwent microscopic examination after potassium hydroxide

preparation, which was done by adding drops of 10% KOH solution on specimen placed on glass slide and covered with cover slip.

Before microscopic examination for the fungi hyphae, all KOH preparations were allowed to stay for 15-30 minutes, and then warmed to dissolve keratinized cells. All fungal specimens regardless of KOH results were then cultured on SDA media and growth was confirmed after 14days. Fungal identifications were done based on colonial morphologies and microscopic appearance of the organism after staining with lactophenol blue reagent.

Parasitic Samples

Skin scraping from scabies lesions was obtained from burrows, by using a blunt side of a surgical blade. The scrapings were placed on a glass slide with a drop of mineral oil; a cover slip was then placed on top. The prepared slide was then examined under low power microscope for the presence of mites.

Histopathologic Samples

Skin biopsy was obtained from appropriate lesions, to establish a histological diagnosis where this was necessary. Local anaesthetic (2% lignocaine) was infiltrated around the site to be sampled, followed by incision or wedge biopsy by using a surgical blade. The specimen was then placed immediately in a bottle containing fixative 10% buffered formalin in the volume ratio of 1:10 (tissue fixative), submitted to the histopathology laboratory for processing. Tissue sections were stained with Haematoxylin and Eosin

then mounted on Dextrene Polystyrene Xylene (DPX) followed by microscopic examination.

Routine investigations

All necessary investigations were performed depending on the provisional non-dermatological diagnoses in order to determine other medical conditions that coexist with identified dermatological disorders. Venous blood was drawn from the study patients for the following laboratory investigations; full Blood Count, Erythrocyte Sedimentation Rate (ESR), Biochemistry panel and Serological studies for (HIV, syphilis and hepatitis). Sputum examination for Acid Fast Bacilli (AFB) and radiological studies; chest radiographies, ultra sounds, echocardiographies were also done among patients when necessary to determine coexisting medical conditions.

4.8 Data management and analysis

Questionnaires were used to collect the required information from patients and their files. Physical checkup was performed on each questionnaire, followed by data entry, and data analysis by using a computer program called statistical package for social sciences (SPSS) version 13. Summary statistics and frequency tables were produced, and chi-square test was used to compare proportions of categorical variables. P value less 0.05 was regarded as significant.

4.9 Ethical considerations

Ethical clearance was sought from the ethical clearance board of the Muhimbili University of Health and Allied sciences (MUHAS). Permission to conduct the study in the medical wards of Muhimbili National Hospital (MNH) was sought from the hospital management.

Written consent was obtained from patients prior to recruitment into the study and for children guardian/parental consent was obtained. Information about the study objectives, aim, and types of dermatological investigations was explained to all participants. Interview and clinical evaluations were done prior to laboratory investigations. All patients found to have dermatological diseases were managed accordingly and upon discharge from the ward, some were scheduled for the follow up at dermatology clinic when necessary. All participants' informations were kept confidential.

5.0 RESULTS

Table 1 shows socio-demographic characteristics and prevalence of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital. The study recruited 390 patients who were admitted to the medical wards. Females were 221, (57%). The study population was relatively young with a mean age of 36.7(SD ± 17.9) years. The age ranged between 7-84 years, and the majority were young adults aged 18 – 44 years (52 %). Children aged 7-17 years and elderly patients aged 61-84 years were few 15% and 12% respectively.

The majority of the study population (64%) had primary level of education. 17% of the patients had secondary education, few (5%) had post-secondary education and informal education was reported by 14% of the patients. Regarding occupation, 51% of the patients were not employed, 42% had informal employment while 7% of the study population had formal employment. House density was determined in 328/390 (84%) of the patients. 63% were residing in rooms comprising 1-2 individuals, 31% were residing in rooms having three to five individuals and 6% were residing in rooms having more than five individuals.

Of the 390 admitted patients, 232 (60%) were found to have dermatological disorders. Males were more affected 110/169 (65%) than females, (122/221; 55%). Being a male was a risk factor for having dermatological disorders, although the difference was not statistically significant (OR 1.51; 95% CI 0.99-2.29; p=0.05).

Patients with age groups 18-31 years and 32-44 years had the highest prevalence of dermatological disorders; (70%) and (66%) respectively, as compared to 49% in children aged 7-17 years. The risk of getting dermatological disorders in young adults aged (18-31 years and 32-44 years) was higher and statistically significant as compared with other age groups; p= 0.01 and p=0.04 respectively. In the remaining two age groups 45-60 years and 61-84 years, the risk of getting dermatological disorders was higher but was not statistically significant, (P values 0.81 and 0.85) respectively.

The risk of getting dermatological disorders was almost the same in patients with primary education (OR 1.21) and those with secondary education (OR 1.22) as compared to patients with informal education, however the statistical differences were not significant p=0.54 and p=0.76 respectively. Post secondary education was a protective of acquiring dermatological disorders (OR 0.85), however statistically this also was not significant p=0.75.

Patients with informal and formal employment were almost equally affected with dermatological disorders (62% in both of them) as compared to unemployed patients who were slightly affected (57%).The differences in occupation groups were not significant p =0.30 and p=0.59 respectively.

Among 328 patients who reported on house-density, dermatological disorders were common in those residing in rooms shared by 3-5 individuals (70 %) compared to those residing in rooms shared by 1-2 individuals (57%) and the difference was statistically

significant (OR 1.69 ; 95%CI 1.02-2.81;p=0.04). Furthermore, sharing a room by more than five individuals increased the risk of having dermatological disorders by about three times (OR 2.80), however this was not statistically significant (p=0.07).

Table 1: Socio-demographic characteristics and prevalence of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital.

Variables	Total patients N =390	Patients with dermatological disorders n= 232 (59.5%)	OR (95%CI), P-value
Sex			
Female	221 (56.7)	122 (55.2)	1.0
Male	169 (43.3)	110 (65.1)	1.51 (0.99-2.29), 0.05
Age Groups (years)			
7-17	59 (15.1)	29 (49.2)	1.0
18-31	105 (26.9)	73 (69.5)	2.36 (1.20-4.63), 0.01
32-44	99 (25.4)	65 (65.7)	1.98 (1.01-3.86), 0.04
45-60	80 (20.5)	41 (51.3)	1.09 (0.55-2.14), 0.81
61 -84	47 (12.1)	24 (51.1)	1.08 (0.49-2.33), 0.85
Education level			
Informal	55 (14.1)	31 (56.4)	1.0
Primary school	248 (63.6)	151 (60.9)	1.21 (0.67-2.18), 0.54
Secondary	66 (16.9)	39 (59.1)	1.22 (0.54-2.32), 0.76
Post secondary	21 (5.4)	11 (52.4)	0.85 (0.31-2.35), 0.75
Occupation			
Not employed	197 (50.5)	112 (56.9)	1.0
Informal employment	164 (42.1)	102 (62.2)	1.24 (0.81-1.91), 0.30
Formal employment	29 (7.4)	18 (62.1)	1.24 (0.56-2.77), 0.59
People per room			
1-2	208 (63.4)	119 (57.2)	1.0
3-5	101 (30.8)	70 (69.3)	1.69 (1.02-2.81), 0.04
>5	19 (5.8)	15 (78.9)	2.80 (0.89-8.84), 0.07

NB

- Age groups (years)–Children 7-17; Young adults 18-44; Adults 45-60; Elderly 61-84.
- House density of 62 patients was not determined.

Table 2 shows the distribution of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital. The overall point prevalence of one or more dermatological disorders was 60%. Among enrolled patients, 191/390 (49%) had one dermatological disorder, 36/390(9%) had two and 5/390(1%) had three dermatological disorders.

Non-infectious dermatological disorders had the highest prevalence 142/232(61%). Of these, inflammatory dermatological disorders comprise 23% (54/232); autoimmune disorders were encountered in 2% (5/232), neoplasms in 5% (12/232) and miscellaneous disorders in 31% (71/232).

Pruritic papular eruption of HIV/AIDS (PPE) was present in 7% (17/232) of the patients with dermatological disorders, followed by seborrhoeic dermatitis in 6% (15/232). Other non-infectious dermatological disorders were prurigo simplex (9/232; 4%), dermatitis (6/232; 3%) and psoriasis (5/232; 2%). Lichen planus 3/232, lichen simplex chronicus (2/232) and prurigo nodularis chronicus (2/232) were fewer.

Of the 232 patients with dermatological disorders, five patients (2%) had autoimmune disorders; three patients had vitiligo, one scleroderma and one bullous pemphigoid. Overall, neoplasms were encountered in 12/232 (5%) of the patients. Kaposi's sarcoma comprised 11/232 (4.7%) and squamous cell carcinoma 1/232 (0.4%), thus 92% of the patients with neoplasms had Kaposi's sarcoma.

Various miscellaneous dermatological disorders commonly encountered were non-septic ulcerations 15/232(6%), acne vulgaris 12/232(5%) and Keloids/scars 12/232(5%). Other miscellaneous disorders include keratoderma climactericum 8/232(3%), chronic lymphoedema 4/232(2%), xerosis 4/232(2%), Steven Johnson syndrome 3/232(1%), fixed drug reaction 3/232(1%), Albinism (1/232), Pseudoacanthosis nigricans (1/232) and the rest had melanocytic naive and pigmentary nail disorders.

Infectious dermatological disorders affected 123/232 (53%) of the patients. Of these, fungal infections (dermatophytes and yeasts) were commonly observed (70/232; 30%). Dermatophytes were 17%; include Tinea unguium (6%), Tinea corporis (6%), Tinea pedis (3%), Tinea cruris (1%) and Tinea capitis (1%). Yeast infections (13%) included Pityriasis versicolor (8%) and Oral candidiasis (6%).

Bacterial infections were encountered in 28/232 (12%) of the patients. The most common conditions were septic ulcers (4%), erythrasma (3%) and cellulites (3%). Abscesses (3/232), impetigo (2/232) and folliculitis (2/232) were least among bacterial diseases.

Patients affected with viral dermatological disorders were 21/232 (9%). The common viral infections included common warts (13/232), followed by herpes simplex infections (5/232), chicken pox (2/232), genital warts (2/232), herpes zoster (1/232) and molluscum contagiousm (1/232). Among infestations subgroup only scabies (2%) was encountered.

Table 2: Distribution of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital. (n = 232)

Dermatological conditions	**Number**	**Percentage of n**
I: Non-Infectious conditions	**142**	**61.2%**
Inflammatory conditions	**53**	**22.8**
PPE	17	7.3
Seborrhoeic dermatitis	15	6.4
Prurigo simplex	9	3.9
Dermatitis	6	2.6
Psoriasis	5	2.2
Lichen planus	3	1.3
Lichen simplex	2	0.9
Prurigo nodularis chronicus	2	0.9
Autoimmune	**5**	**2.2**
Vitiligo	3	1.3
Bullous pemphigoid	1	0.4
Scleroderma	1	0.4
Neoplasms	**12**	**5.2**
Kaposi's sarcoma	11	4.7
SCC	1	0.4
Miscellaneous	**71**	**30.6**
Non-septic ulceration/bruises	15	6.4
Acne vulgaris	12	5.2
Keloids/Scars	12	5.2
Fissures keratosis Plantaris (keratoderma climactericum)	8	3.4
Xerosis	4	1.7
Lymphoedema	4	1.7
Steven Johnson syndrome	3	1.3
Fixed drug eruption	3	1.3
Albinism	1	0.4
Others	12	5.2
II: Infectious conditions	**123**	**53%**

Fungal infections	**70**	**30.2**
Dermatophytes	**39**	**16.8**
Tines Corporis	14	6.0
Tines Unguium (Onychomycosis)	14	6.0
Tines Pedis	7	3.0
Tinea Cruris	3	1.3
Tinea capitis	2	0.9
Yeast infections	**31**	**13.4**
Pityriasis versicolor	18	7.8
Oral Candiddasis	13	5.6
Bacterial infections	**28**	**12.1**
Septic Ulcers	10	4.3
Erythrasma	8	3.4
Cellulitis	6	2.6
Furuncles/Carbuncles/Abscess	3	1.3
Folliculitis	2	0.9
Impetigo	2	0.9
Viral infections	**21**	**9.1**
Common warts	13	5.6
Herpes simplex	5	2.2
Genital warts	2	0.9
Chicken pox	2	0.9
Molluscum contagiousm	1	0.4
Herpes zoster	1	0.4
Infestations	**4**	**1.7**
Scabies	4	1.7

NB: A patient could have more than one diagnosis.

Table 3 shows the results of dermatological investigations among patients with dermatological disorders admitted to medical wards. Of the 232 patients with dermatological disorders, 63 (27%) underwent dermatological investigations. Of these, thirteen (21%) were investigated histopathologically through skin biopsy and 10 of them (77%) were confirmed to have malignancy. Of those who had histologically proven malignancy, nine had Kaposi's sarcoma and one had squamous cell carcinoma. Two patients with clinically visceral Kaposi's sarcoma did not undergo histological confirmation. The remaining 3/13(23%) patients who were investigated histopathologically their biopsy result showed chronic inflammatory cells. Mycological investigations were done among 35/63 (56%) patients who underwent dermatological investigations, 69% (24/35) had KOH positive results and 31% (11/35) had negative results. Furthermore, when all specimens from these 35 patients were subjected for fungal culture regardless of KOH results, 40% (14/35) grew dermatophytes of genus Trichophyton, 17% (6/35) grew yeasts and 46% (16/35) had no growth. Of the 63 patients who underwent dermatological investigations, pus swabs were collected from 12 patients (19%) who had septic wounds, carbuncles and abscesses; and were investigated microbiologically. *Staphylococcus aureus* was isolated from 42% (5/12) of the patients, *Escherichia coli* from 42% (5/12), proteus species was isolated from 17 %(2/12) of the patients and 8% (1/12) had Pseudomonas. Among four patients who satisfied clinical presentation for scabies; three were investigated for mite (*Sarcoptes scabiei*) however, the mite was not identified from all specimens probably due to chronicity of the lesions and self-treatment, which could have made it difficult to find the mites.

Table 3: The results of dermatological investigations among patients with dermatological disorders admitted to medical wards at Muhimbili National Hospital. (n=63)

Results of dermatological investigations	Number of Patients underwent investigations n= 63	% Percentage of n
Histopathological investigations	**13**	**20.6**
Malignant cells	10	15.9
Inflammatory cells	3	4.7
Mycological investigations	**35**	**55.6**
KOH		
Positive	24	38.1
Negative	11	17.5
Fungal culture		
Trichophyton sp	14	22.3
Yeasts	6	9
No growth	16	25.4
Microbiological investigations		
Bacterial culture	**12**	**19.0**
Staphylococcus aureus	5	7.9
Escherichia coli	5	7.9
Proteus sp	2	3.2
Pseudomonas aureginosa	1	1.6
Parasitological investigations	**3**	**4.8**
Microscopy for *Sarcoptes scabiei*	3	4.8

NB: A patient could have more than one result.

Some patients had mixed infections.

Proportion of patients with dermatological disorders diagnosed at admission among patients admitted to medical wards in relation to sex and age.

Among 390 admitted patients, 78 (20%) were diagnosed to have dermatological disorders by the admitting doctors. Of these, 69/390(18%) had single diagnosis and 9/390(2%) had two diagnoses. In relation to sociodemographic characteristics, males and females were almost equally affected with dermatological disorders; 32/169(19%) and 46/221(21%) respectively and the difference was not statistically significant p=0.702.

When age of the patients were considered, young adults aged (32-44) years 27% and adults (45-60)years 21% were more identified with dermatological disorders by the admitting doctors as compared to other age groups, the difference between age groups was not statistically significant p=0.203

Proportion of dermatological disorders diagnosed by referring medical practitioners among patients referred for admission to the medical wards.

Out of 390 admitted patients, 41(11%) were identified to have clinical dermatological disorders pre admission as per their referral letters. Kaposi's sarcoma was easily identified by referring medical practitioners 14/41(34%), followed by inflammatory disorders 11/41(27%) which included dermatitis and psoriasis.

Infectious dermatological disorders were identified in 5/41(12%) patients, namely fungal infections (2/41), bacterial infections (2/41), and cutaneous viral infections (1/41). Vitiligo (1/41) was the only autoimmune disorders reported.

Miscellaneous dermatological disorders were reported in 10/41(24%) patients, these were non-specific diagnoses like rashes (5/41), Steven Johnson syndrome (3/41), and ulcers (2/41).

Table 4 shows the proportion and pattern of distribution of dermatological disorders pre admission, at admission and post admission. When the distribution pattern of dermatological disorders were looked pre admission, at admission and after admission; proportional of admitted patients identified with dermatological disorders pre admission 41/390(11%) were fewer. The identification of dermatological disorders was noted to increase at admission (20%) and after admission (60%).

Non-infectious dermatological disorders were mostly identified at different admission categories. Of these, neoplasms especially Kaposi's sarcoma were highly suspected by referring medical practitioners (14/41;34%) as well as by admitting doctors in medical ward (15/78;19%). After admission, those patients who were suspected to have malignancies, (12/232) patients were confirmed to have malignance (10/232) histologically and (2/232) clinically. Miscellaneous conditions as well as autoimmune disorders were less reported pre admission and at admission.

Regarding infectious disorders, more patients were identified after admission (during data collections) as compared to pre admission and at admission. None of the patients were reported to have infestations pre admission and at admission.

Table 4: The proportion and pattern of distribution of dermatological disorders pre admission, at admission and after admission among patients admitted to medical wards at Muhimbili National Hospital.

Dermatological diagnoses	**Number of patients with dermatological disorders pre admission (n=41; 10.5%)**	**Number of patients with dermatological disorders at admission (n=78; 20%)**	**Number of patients with dermatological disorders after admission (n=232; 59.5%)**
I: Non-Infectious disorders	**36 (87.8)**	**52 (66.7)**	**142 (61.2)**
Inflammatory conditions	11 (26.8)	20 (25.6)	53 (23.3)
Autoimmune	1 (2.4)	3 (3.8)	5 (2.2)
Neoplasm	14 (34.2)	15 (19.2)	12 (5.2)
Miscellaneous	10 (24.4)	14 (17.9)	71 (30.6)
II: Infectious disorders	**5 (12.2)**	**35 (44.9)**	**123 (53)**
Fungal infections	2 (4.9)	20 (25.6)	71 (30.2)
Bacterial infections	2 (4.9)	8 (10.3)	28 (12.1)
Viral infections	1 (2.4)	7 (8.9)	21 (9.1)
Infestations	0	0	4 (1.7)

NB:

- A patients could have more than one diagnosis
- Pre admission-at referral level of care
- At admission –during clerkship by admitting doctor
- After admission-during data collection(by author)

Table 5 shows dermatological disorders as self-reported chief complaints in relation to dermatological confirmation among patients admitted to medical wards at Muhimbili National Hospital. On reviewing files of all 390 enrolled patients, dermatological disorders were self-reported by few patients (46/390; 12%) as chief complaints at admission. These 46 patients comprised 20% of the 232 patients who were confirmed to have dermatological disorders after admission (during data collection).

Of the 390 admitted patients, 48% (186/390) had dermatological disorders but did not complain. Of all those who did not complain of dermatological disorders, 54% (186/344) were found to have dermatological disorders. Of all 232 patients confirmed with dermatological disorders, 80% (186/232) did not complain of dermatological disorders at admission.

Table 5: Dermatological disorders as self reported chief complaints in relation to dermatological confirmation among patients admitted to medical wards at Muhimbili National Hospital. (N=390)

Variables	**Dermatological confirmation**			
Patients complaints	**Yes-Confirmed**	**Not confirmed**	**Total**	**P value**
Dermatological disorders reported	46 (19.8%)	0	46 (11.8%)	0.0001
Dermatological disorders not reported	186 (54.1%) (80.2%)	158 (45.9%)	344 (88.2%)	
Total	232 (59.5)	158 (41.5)	390 (100)	

Table 6 shows the proportion of patients who were aware of dermatological disorders in relation to sex, age, education, duration of lesions and dermatological confirmation among patients admitted to medical wards at Muhimbili National Hospital. Regarding awareness, all 390 patients were probed by direct questioning to assess their awareness on dermatological disorders, and then were examined to confirm dermatological lesions. Regardless of presence or absence of dermatological disorders, the majority 216/390(55%) were not aware and only 174/390(45%) were aware of dermatological disorders. Of those who were aware of their dermatological disorders, males had a higher proportion (49%) compared to females (41%) but the difference was not statistically significant. (P= 0.118)

When awareness of dermatological disorders was related to the age of the patients, young adults aged 32-44 years (53%) were found to be more aware; followed by those aged 45-60 years (46%) and lastly, elderly group aged 61-84(43%) .The awareness was less in young adults aged 19-44 years (43%) and children aged 7-17 years (37%). However, the p-value of the equality of the odds ratio between different categories of age is 0.34, which is statistically not significant.

Considering the influence of education on patient's awareness, the majority of the patients with post secondary education (48%) were aware. Informal education (44%), Primary education (45%) as well as secondary education (44%) had almost the same influence on patient's awareness. The difference was not statistically significant and the p-value of the equality of the odds ratio between different educational levels is=0.989.

Of the 174 patients who were aware of their dermatological disorders, the duration of their lesions were determined in 165 patients. For those patients, who had lesions lasting month(s) (80%) and year(s) (80%), the majorities were aware of their dermatological disorders as compared to those with lesions lasting less than a month (74%). For those patients who did not remember the duration of their lesions, few were aware (44%).The difference was statistically significant, p =0.003.

When dermatological confirmation was related to patients' awareness, most of the aware patients (165) were confirmed to have dermatological disorders, comprising 71% of 232 patients with dermatological disorders. This was statistically significant p=0.0001

Table 6: Proportion of patients who were aware of dermatological disorders in relation to sex, age, education, duration of lesions and dermatological confirmation among patients admitted to medical wards at Muhimbili National Hospital (N=390).

Variables	Patients awareness		N= 390	P - value
	Aware 174 (44.6%)	Not aware 216 (55.4%)		
Sex				
Male	83 (49.1)	86 (50.9)	169	0.118
Female	91 (41.2)	30 (58.8)	221	
Age Groups (years)				
7-17	22 (37.3)	37 (62.7)	59	
18-31	43 (41.0)	62 (59.0)	105	0.6462
32-44	52 (52.5)	47 (47.5)	99	0.0642
45-60	37 (46.3)	43 (53.8)	80	0.2924
61 -84	20 (42.6)	27 (57.4)	47	0.5837
Education level				
No formal	24 (43.6)	31 (56.4)	55	
Primary school	111 (44.8)	137 (55.2)	248	0.8798
Secondary	29 (43.9)	37 (56.1)	66	0.9734
Post secondary	9 (47.6)	11 (52.4)	21	0.7564
Duration of lesions				
Less than a month	34 (73.9)	12 (26.1)	46	
Month(s)	68 (80.0)	17 (20.0)	85	0.4249
Year(s)	41 (80.4)	10 (19.6)	51	0.4491
Don't know	22 (44.0)	28 (56.0)	50	0.0031
Dermatological confirmation				
Yes Confirmed	165 (71.1)	67 (28.9)	232	0.0001
Not confirmed	9 (5.7)	149 (94.3)	158	

Table 7 shows the proportion and pattern of coexistence between dermatological disorders and other diagnosed medical conditions among patients admitted to medical wards at Muhimbili National Hospital. Among admitted patients 384/390 (98%) had medical (non-dermatological) conditions as the primary diagnosis and primary reason for admission. Of these, 226/384 (59%) were found to have coexisting dermatological disorders.

Dermatological disorders coexisted more with non-dermatological infectious diseases (87/384; 23%); comprised of HIV disease (69/87; 79%), tuberculosis (10/87; 12%), malaria (5/87:6%), meningitis (2/87) and pneumonia (1/87). Almost all patients with oral candidosis (11/13), common warts (10/13), PPE (15/17), seborrhoeic dermatitis (10/15), and psoriasis (4/5) had HIV disease. In addition, all patients with Kaposi's sarcoma (11), genital warts (2), herpes zoster (1) and molluscum contagiosum (2) coexisted with HIV disease.

Coexistence of dermatological disorders with endocrine disorders was encountered in patients with Diabetes mellitus 22/384(5.7%). Commonly dermatological disorders encountered in patients with diabetes mellitus include dermatophytes (10/22), ulcers (4/22) vitiligo (2/22), Steven Johnson Syndrome (2/22), fissures keratosis plantaris (3/22) and Norwegian scabies (1/22).

Among patients with cardiovascular diseases, 33/384(9%) had dermatological disorders. These include patients with chronic heart failure due to cardiomyopathy 15/33, followed by rheumatic heart disease 11/33, hypertension 6/33 and congenital heart disease 1/33.

Twenty-four patients (6%) with hematological diseases had coexisting dermatological disorders, these comprised patients with Leukemia (9/24), sickle cell disease (9/24) and anemia (6/24). Among patients with renal diseases, dermatological disorders were found in only 4% (16/384) of the patients.

Of the patients with Liver diseases 12/384(3%) had dermatological disorders, most of them had xerosis and pruritus simplex. Other patients with coexisting dermatological disorders include; 12/384(3%) patients with solid tumors, 12/384(3%) miscellaneous medical conditions, and 8/384(2%) patients with neurological diseases.

Table 7: The proportion and pattern of coexistence between dermatological disorders and other diagnosed medical conditions among patients admitted to medical wards at Muhimbili National Hospital. (N=384)

Non dermatological medical conditions as final admission diagnosis	**Number of Patients with Non dermatological medical conditions N=384**	**Number of Patients Coexisting with dermatological disorders 226 (58.8%)**
Infectious diseases	109	87 (22.6%)
Cardiovascular diseases	75	33 (8.6%)
Hematological diseases	55	24 (6.3%)
Endocrine diseases	33	22 (5.7%)
Renal diseases	29	16 (4.2%)
Hepatic diseases	19	12 (3.1%)
Tumors	26	12 (3.1%)
Miscellaneous	24	12 (3.1%)
Neurological diseases	14	8 (2.1%)

NB: Six patients were admitted due to dermatological disorders only.

Table 8 describes the commonly prescribed dermatological preparations to patients with dermatological disorders admitted to medical wards at Muhimbili National Hospital pre admission and at admission. Dermatological preparations records were found in 12/41 (29%) of the patients identified with dermatological disorders pre admission by referring practitioners. Most of these patients had non-specific drugs 7/12(58%). Other prescriptions recorded were antifungal 2/12 (17%), anticancer 2/12 (17%) and antibiotics 1/12 (8%). Antivirals and steroids were not recorded.

Dermatological preparations were given to 58% (45/78) of the patients who have dermatological disorders at admission. The admitting doctors in the medical wards, prescribed non-specific drugs for dermatological disorders in majority of the patients 17/45(38%). Other prescribed drugs were antifungals 16/45 (36%), antibiotics 6/45 (13%), steroids 3/45(7%), anticancer 2/45(4%) and antiviral 1/45(2%).

Table 8: The commonly prescribed dermatological preparations to patients with dermatological disorders admitted to medical wards at Muhimbili National Hospital pre admission and at admission.

Variables	**Pre admission**	**at admission**
Patients with prescriptions	n= 12 (29.3%)	n=45 (57.7%)
Types of drugs used		
Antibiotics	1 (8.3%)	6 (13.3%)
Antifungals	2 (16.7%)	16 (35.6%)
Antivirals	0	1 (2.2%)
Steroids	0	3 (6.7 %)
Cytotoxic	2 (16.7%)	2 (4.4%)
Non specific	7 (58.3%)	17 (37.7%)

6.0 DISCUSSION

This hospital-based cross sectional study describes the magnitude and awareness of dermatological disorders among patients admitted to medical wards at Muhimbili National Hospital. The overall prevalence of dermatological disorders in the current study was 60%, higher compared to previous study conducted at the same hospital, which reported the prevalence of mucocuteneous disorders of 42%. [36] The higher prevalence could be due to the fact that any form of dermatological disorders was included in this study. In addition, the higher prevalence is almost consistent with global prevalence of dermatological disorders in developing countries which range from 20% to 80%.[4] This signifies that, dermatological disorders represent one of the most frequent causes of morbidity in communities of developing countries.

Dermatological disorders affect all age groups of both sexes in most communities of developing countries. The pattern of dermatological disorders varies markedly with the age structure of the communities. [4, 5, 6] In the present study, young adult groups aged 18-31 years and 32-44 years were mostly affected. The difference among the age groups was statistically significant. The findings are contrary to other studies done in Tanzania, which reported higher rate among younger age groups. [4,8,13] However, the similar findings were reported by Kathem et al in Iraq community survey that estimated the prevalence and distribution of skin diseases; and reported higher rate among age groups 15<25 and 25<45. [6]

In most developing countries, community-based studies reported overcrowding to be a major risk factor for dermatological diseases.[7, 8, 18,] This influences the overall prevalence, pattern and distribution of dermatological diseases. The current study shows that, as the number of persons per room increases from three to five and above, the probability of getting dermatological diseases gets higher. The finding is in keeping with community surveys done in most developing countries.[6, 42] However; the differences between other socio-demographic variables in this study, such as sex, level of education and occupation were not statistically significant.

In this study, males had a higher prevalence of dermatological disorders than females. Being a male was a risk factor for getting dermatological disorders. This is consistent with other studies done elsewhere.[11, 39] The reasons for this could be the difference in attitude and awareness towards the skin care between genders. However, this study has shown no statistical difference on levels of awareness between genders.

Studies reported that, health-seeking behavior in communities is influenced by the patient's education.[41] This is consistent with the current study whereby, patients with higher education level particularly post-secondary education were at low risk of getting dermatological disorders by 15%, however the difference again was not statistically significant.

The nature of occupation was reported by different studies worldwide to be a risk factor for contracting dermatological disorders.[10, 29, 31] This contrasts the current study, in

which patients with formal and informal employments were almost equally affected with dermatological disorders. However, more specific analysis of each category of occupation was not possible due to the small sample size.

Many health authorities underestimate the burden of dermatological disorders.[4, 5] The current study verifies an increased burden of dermatological disorders among patients admitted to medical wards of Muhimbili National Hospital. When all forms of dermatological disorders were considered together, the leading dermatological disorders were fungal infections (30%). These were followed by inflammatory conditions (23%), bacterial infections (12%), viral infections (9%) and neoplasms (5 %). The autoimmune disorders (2%) and infestations (2%) were the least observed. The pattern of dermatological disorders in this study could be explained by various risk factors like underlying chronic illnesses among patients. However, this is almost similar to other studies conducted in developing tropical countries. [4,5,20]

In this study, dermatophytes comprise 17% of superficial fungal infections in which Tinea corporis and Tinea unguium were the most common. The fungal isolates from different body sites of the patients were Trichophyton species namely *T.mentagrophytes and T. rubrum*. This is almost similar to other studies in most developing communities of African countries where the higher rates of dermatophytes were reported. In addition, different studies done in different countries or within same country may report variations

in fungal isolates. The explanation for this could be inadequate treatment, asymptomatic nature of dermatophytosis, overcrowding and tropical climate. [8,17,16,42]

Yeast infections (13%), comprised pityriasis versicolor and candidiasis. Pityriasis versicolor had a higher proportion (8%). In this study, children and adolescent were commonly affected. This is comparable to community studies, which reported higher prevalence among children in Tanzania.[7, 28] The reasons for this could be the risk factors for pityriasis versicolor which were similar to other studies, which include age, overcrowding and climatic conditions of tropical Africa.

The pattern of coexistence between dermatological and other medical conditions was considered in this study. Non-dermatological medical conditions were the primary reason for admission in majority of the patients; which is similar to study by Sassi done in the same wards. [36] The study further shows that, most of the patients with dermatological disorders secondary to viral infections, inflammatory conditions and neoplasms were likely to have chronic systemic medical conditions in which HIV disease was the commonest. Over two thirds of the patients with the following dermatological conditions were HIV infected; PPE (15/17), seborrhoeic dermatitis (10/15), oral candidiasis (11/13), cutaneous warts (10/13) and psoriasis (4/5). On other hand, nearly all patients with Kaposi's sarcoma (11) genital warts (2), Molluscum contagiosum (1) herpes zoster (1) were also HIV infected. This is consistent with other studies on HIV related dermatoses done worldwide. [12, 14,15,36,51]

Other chronic systemic diseases seen to coexist with dermatological diseases were diabetes mellitus, chronic kidney disease and hepatic diseases. Septic ulcers were common dermatological disorder observed in these systemic diseases. The Isolated bacteria from twelve cultured samples were *Staphylococcus aureus* (5%) and *Escherichia coli* (5%). *Pseudomonas aureginosa* and Proteus species were the mixed isolates. The findings were almost similar to other studies that reported *Staphylococcus aureus* to be predominant isolates.[47, 48, 49]

Vitiligo is an important dermatological disorder because of its cosmetic importance and the association with other autoimmune systemic diseases. In this study, vitiligo (1%) was the commonest autoimmune condition observed; with the prevalence, which was almost similar to worlds' reported prevalence of 1 - 4%.[56, 57] In addition, patients with vitiligo seen in this study had coexisting anemia and diabetes mellitus.

Among patients with dermatological disorders, 2% satisfied the clinical diagnosis for scabies. The skin scrapings for laboratory microscopic confirmation of the mites were negative in all these patients. The findings are comparable to previous study by Sassi, [36] who reported difficults in laboratory confirmation of the mites. The reasons for these difficults could be the chronicity of the lesions and the associated inflammatory response, which could have made it difficult to confirm the mites from the scrapings. In addition to these, low sensitivity of the skin scrapings (less than 50%) as a diagnostic test could explain.[20] Other reason could be self-treatment before admission in this tertially level of care.

Studies conducted in Brazil, Peru and South Africa shows low prevalence of acne vulgaris among rural people than urban Westernized societies. [32] In this study, Acne vulgaris occupies (5%) of dermatological disorders. This prevalence is lower compared to previous studies done in Dar-es salaam Tanzania. [28, 33] The reasons for low prevalence could be the age structure of the study population whereby, the majority of the patients were post adolescence, hence the expected low rate of acne vulgaris. Other risk factors could explain the difference; genetic, environmental factors and type of diets consumed by the study population.

Other miscellaneous dermatological conditions were observed with relatively low frequency. Their occurrences were sporadically reported among patients with different medical conditions. Commonly were keratoderma climactericum (3%), xerosis (2%), chronic lymphoedema (2%), Steven Johnson syndrome (1%), fixed drug eruption (1%), and albinism (1%). Pseudoacanthosis nigricans, pigmentary nail disorders and melanocytic nevi were also observed.

Although awareness to certain common skin diseases, which were previously underestimated, has grown up, their priorities are still low in most health authorities of developing countries. These diseases were reported to contribute 6% to 24% of the total visits at primary health care levels.[4], [5] In this study, the prevalence of dermatological disorders preadmission and at admission were underestimated 11% and 20% respectively. These figures are in keeping with that of primary health care levels in most of the developing countries.

Furthermore, the majority of the patients in this study (88%) did not complain about dermatological symptoms. On confirmation, more than half 186 (54%) of them were found to have dermatological disorders comprising 80% of those with dermatological disorders. Figueroa et al of western Ethiopia reported similar findings in one of the community survey. He found out that, the majority (67%) of participants who denied of having skin diseases were actually affected on examination. [42] This could be explained by the attitudes of underestimating and unawareness towards the dermatological disorders.

In this study, direct questioning (probing) was used to assess patients' awareness on dermatological disorders before undergoing dermatological examination. The majority of the patients (55%) were not aware of their dermatological disorders. Seventy one percent of all patients who admitted to be aware were found to have dermatological disorders after examination. This shows that, direct questioning increases the sensitivity of identifying dermatological disorders by 51% compared to spontaneous complaint. Further assessment done among aware patients showed that, the longer the duration of the lesions from months to years the more the patients became aware. However, the influence of gender, age, and education on patients' awareness did not show any statistically significant.

7.0 CONCLUSION

The study showed that, dermatological disorders are common among admitted patients and more than half of patients were not aware of these disorders. A diversity of dermatological disorders ranging from benign to life threatening conditions were observed among admitted patients. Dermatological disorders were rarely documented as primary or additional diagnosis preadmission as well as at admission. Few patients self-reported on dermatological symptoms; however, the probing mechanism increases the chance of diagnosing the dermatological disorders.

8.0 STUDY LIMITATIONS

The study recruited patients from tertially level of health care. Most of these patients had dermatological disorders for a long time, thus, a natural picture of the dermatological disorders was altered with the chronicity of the diseases, prior and inadequate treatment, hence, specimens were inadequate and some lead to negative results.

Lack of full-equipped min-laboratories in medical wards of Muhimbili National hospital, necessitated transferring of the specimens to the main laboratory (CPL), this contributed to the loss of some of the delicate and tiny specimens especially scrapings from nails and skin; hence interfered with laboratory confirmations.

9.0 RECOMMENDATIONS

Basic dermatological education should be provided to the patients as well as to the health care workers at primary and secondary care level, in order to improve knowledge, awareness and health seeking behaviors on dermatological disorders.

10.0 REFERENCES

1. Hiroshi S. Structure and Function of the Skin. Shimizu's Textbook of dermatology.1st Edition. Hokkaido University Press, 2007; chapter 1.
2. Thomas J.L, Kim B.Y, Jean L.B and Irwin M.B. Approach to the patient with skin disorder and Skin Manifestations of Internal Disease. Harrison's Principles of Internal Medicine. 14th Edition. The McGraw- Hill Companies, 1998; Chapter 54-57, Part 2, Section 9,294-328.
3. Tracy W and Deon de B. Getting Under the Skin. The Inscription of Dermatological Disease on the Self-Concept.*Indo-Pacific Journal of Phenomenology* 2006; 6(1) 1-12.
4. Roderick H, Sandra EB, Suephy C et al. Skin Diseases. Disease Control Priorities in Developing Countries 2006. A custom publication of the Disease Control Priorities Project, Chapter 37,217-231.
5. Mahe A, Faye O, Hay R.J et al. Integration of basic dermatological care into primary health care services in Mali. Bulletin of World Health Organization. Available from http://goliath.ecnext.com/coms2/gi_0199-5167883/Integration-of-basic-dermatological-care.html - 39k (Accessed 9th may 2009).
6. Kathem K and Laith K. Dermatoepidemiology: A household survey among two Urban Areas in Basrah City, Iraq. *The Internet Journal of Dermatology*. 2006; Volume 4 Number 2.

7. Ferié J, Dinkela A, Mbata M et al. Skin disorders among school children in rural Tanzania and an assessment of therapeutic needs. *Tropical Doct* 2006 Oct;36(4):219-221.

8. Epidemiology and management of Common Skin Diseases in Children in Developing countries.

   Available http://www.streetchildren.org.uk/reports/WHO_FCH_CAH_05.12.pdf.

9. Eric F, Ciara G, Tim D et al. The Burden of Skin Diseases 2004. The Society for Investigative Dermatology and The American Academy of Dermatology Association. The Lewin Group, Inc. 2006.

10. Health and Safety Enquiries. Medical aspects of occupational skin disease. HSE Books. 2nd Edition. Health and Safety Executive; 2004. Guidance Note.

11. Marie-Louise TJ. Defining the burden of skin diseases in the United States-A historical perspective. *J Investig Dermatol Symp Proc* 2004; 9:108-110.

12. Toby A. Maurer. Dermatological manifestations of HIV Infection. *International AIDS Society* 2005; 13(5)149-153.

13. Ochicha O,Edino ST,Mohammed AZ et al. Dermatological malignancies in Kano, Nothern Nigeria: A histopathological Review. *Annals of African Medicine* 2004; 3(4):188-191.

14. Thompson DS, Bain B and Innis AE. The prevalence of Mucocuteneous Disorders among HIV-positive patients attending an Outpatients Clinic in Kingston,Jamaica.*West Indian Med J* 2008;57(1)54.

15. Jack SR, MartaVB, Lisa F et al. Etiology of Pruritic Papular Eruption with HIV Infection in Uganda. *JAMA* 2004; 292(21):2614-2621.

16. Walker SL, Shah M, Hubbard VG et al. Skin disease is common in Rural Nepal; result of point prevalence study. *British Journal of Dermatology 2008*; 158(2):34-338.

17. Abdel H.K Abdel A, Hofny ERM. Prevalence of skin diseases in rural areas of Assiut Governorat, Upper Egypt. *Int J Dermatol* 2003; 24(11):887-892.

18. Gibbs S. Skin disease and socioeconomic conditions in rural Africa: Tanzania. *Int J Dermatol* 1996 Sept; 35(9):633-9.

19. Jorg H, Thomas W, Gundel H et al. Seasonal Variation of Tungiasis in an endemic community. The American Society of Tropical Medicine and Hygiene. *Am. J. Trop. Med. Hyg*. 2005; 72(2): 145–149.

20. Shelley FW and Bart JC. Problems in Diagnosing Scabies,a Globla Disease in Human and Animal Populations. *Clinical Microbiology Reviews*.2007;p268-279.

21. Heukelbach J,WilckeT and Feldmeier H. Epidermiology and morbidity of scabies and pediculosis capitis in resource-poor communities in brazil.*British Journal of Dermatology* 2005;153:150-156.

22. Fabiana T.K. Disease perception and self medication in patients with scabies.*An Bras Dermatol* 2006;81(4);335-40.

23. Wilfried S. Community health workers reduce skin diseases in East African children. *International Journal of Dermatology*.2002; 37(5):370-377.

24. Henderson CA. Skin disease in rural Tanzania .*Dermato Practice* 1986; 4:14-19.

25. Anil K.J and Dipendra G. Seasonal variation of skin diseases in Nepal. A Hospital based annual study of out-patient visits in 1999. Department of Dermatology and Venereology, Nepal Medical College and Teaching Hospital, Jorpati Kathmandu.

26. A Souissi, F Zeglaoui and B Zouari. Skin Disease in Tunisia. Epidemiological Report, *Acta Dermatoven APA* 2007; volume 16, No 3.

27. Satimia FT, McBridge SR, Leppard B. Prevalence of skin disease in rural Tanzania and factors influencing the choice of health Care, Modern or Traditional .*Arch Dermatology* 1998; 134 (9):1363-1366.

28. Komba VE. Dermatological disorders among primary school children in Dar es Salaam, Tanzania. Masters thesis. Muhimbili University of Health and Allied Sciences; 2008.

29. Bilal D. Epidemiology of cutaneous diseases in Military Medical Center in Eastern Anatolia. *Turkiye klinikleri J Dermatol* 2005, 15:71-76.

30. Derek RS, Jae WC,Dong SY et al. A comparison of skin diseases among nursing home health care workers in Japan and Korea. *Safety Science Monitor* 2004; 8(1):1-4.

31. Dekek R.S,Yue-Liang LG,Yung-Ling et al. Prevalence of skin disease among nursing home staff in Southern Taiwan. *Industrial health* 2002; 40: 54-58.

32. Loren C,Staffan L,Magdalena H et al. Acne vulgaris,A disease of Western Civilization. *Arch Dermatol* 2002; 138:1584-1590.

33. Mgonda YM, Lutale JJ. Acne in secondary school students in Dar es Salaam: perceptions, attitudes and implications. *Tanzania Med J* 2001; 16(2):21-4.

34. Susannah MC, David AH, Catherine AW et al. Dermatological conditions in intensive care: a secondary analysis of the Intensive Care National Audit and Research Centre (ICNARC) case mix programme database. Critical Care 2008, Available online http://ccforum.com/content/12/S1/S1

35. Jessop SF,Mckenzie RF,Milne J et al. Pattern of admissions to a tertiary dermatology unit in South Africa .*International Journal of Dermatology* 2002; 41(9):568-570.

36. Sassi A. The prevalence of scabies and other cutaneous Manifestations and the performance of the Medmira Rapid HIV Test, an experience among hospitalized HIV-infected adult at Muhimbili Medical Center, Dar es Salaam Tanzania. Masters Thesis. Muhimbili University College of Health Sciences; 1998.

37. David K L, Maria C, Kamija P J et al. Prevalence and indicators of HIV and AIDS among adults admitted to medical and surgical wards in Blantyre, Malawi. INFODIGEST AWARENESS BULLETIN. WHO Regional Office for Africa. HLT/009 September 2003.

38. The President's Emergency Plan for AIDS Relief (PEPFAR) Tanzania Country Profile; 2007. http://www.pepfar.gov/press/81642.htm

39. The Brazilian society on Dermatology. Data analysis of the Brazilian Society of Dermatology skin cancer prevention campaign, 1999 to 2005.*An Bras Dermatol 2006*; 81(6):529-35.

40. Sandy R, McBride, Barbara JP. Attitudes and Beliefs of an Albino population Toward Sun Avoidance. *Arch Dermatol* 2002; 138:629-632.

41. Cristin R,Cristin DP,Paolo G et al. Insufficient knowledge among Psoriasis patients can represent a barrier to participation in decision-making. *Acta Derm Venereol* 2006; 86: 528–534.

42. Figueroa JI, Fuller LC, Abrah A et al. Dermatology in the southernwestern Ethiopia: rational for a community approach. *Int J Dermatol* 1998; 37:752-8.

43. Orlando Canizarae. A manual of Dermatology for Developing Countries.2nd Edition. New York University College of Medicine. Oxford University Press, 1993.

44. Falco O.B, Plewig G, Wolff HH.Dermatology.3rd Edition.Springer-Verlag Berlin Heidelberg 1991.

45. Stephan JM, Maxine AP, Lawrence M.T. Current Medical Diagnosis and treatment.47th Edition. The McGraw-Hill Companies, Inc 2008; 85-140.

46. Thomas BF, Irwin MF and Frank A. Dermatology in General Medicine.3rd Edition. The McGraw-Hill Companies, volume two pp1599-2644.

47. Mahreen A and Beverley A. Community Dermatology.*J Comm Dermatol* 2006; 3(4): 17 – 32.

48. Robbert SA,Johannes C,Sander K et al. Association between skin diseases and severe bacterial infections in children: case-control study.*BMC Family Practice* 2006; 7:52

49. Masawe AEJ, Nsanzumuhire H, Mhalu F. Bacterial skin infections in preschool and school children in coastal Tanzania. *Arch Dermatol* 1975; 111:1312-6.

50. British Association of Dermatologists: Psoriasis guideline (2006) available at www.bad.org.uk/healthcare/guidelines/psoriasis_guideline_(Final update)_280906.pdf

51. Alan EM. Cancers in the Tropics. Chapter 16. Available at www.tropmed.org/primer/chapter16.pdf -

52. Isabelle M and Robert S. Risk of Developing a Subsequent Nonmelanoma Skin Cancer in Patients with a History of Nonmelanoma Skin Cancer. A Critical Review of the Literature and Meta-analysis. *Arch Dermatol* 2000; 136:1524-1530.

53. Luigi N, Liliane C, Roberto P.Prevalence of Actinic Keratosis and Associated Factors in a Representative Sample of the Italian Adult Population. *Arch Dermatol* 2006; 142:722-726.

54. Bernard M.Karnath. Pruritus: A sign of Underlying Disease. Hospital Physician 2005 October. available at www.turner-white.com

55. Dervis E and Serez K.The prevalence of dermatologic manifestations related to chronic hepatitis C virus infection in a study from a single center in Turkey. *Acta Dermatoven APA* 2005; 14(3):93-98.

56. Shahin A, Manouchehr S, PeymanJ etal. DLQI scores in vitiligo: reliability and validity of the Persian version. *BMC Dermatology* 2004; 4(8):1-5 available at http://www.biomedcentral.com/1471-5945/4/8

57. Tao L, Tianwen G, Anhui W et al.Vitiligo prevalence study in Shaanxi Province, China. *International Journal of Dermatology* 2007; 46, 47–51.