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Proportion of Skin Diseases and Associated Factors in Addis Alem Primary Hospital From June 2020-May 2021, Bahir Dar, Ethiopia: A Cross-Sectional Study

Asressie, Mamo

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BAHIR DAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
DEPARTMENT OF Dermatovenereology

Proportion of Skin Diseases and Associated Factors in Addis Alem
Primary Hospital From June 2020-May 2021, Bahir Dar, Ethiopia: A
Cross-Sectional Study

By: Asressie Mamo (Md)

October 2022

BAHIR DAR UNIVERSITY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
PROPORTION OF SKIN DISEASES AND ASSOCIATED FACTORS
IN ADDIS ALEM PRIMARY HOSPITAL FROM JUNE 2020-MAY
2021, BAHIR DAR, ETHIOPIA: A CROSS-SECTIONAL STUDY

A THESIS REPORT SUBMITTED TO DEPARTMENT OF
DERMATOVENEREOLOGY, SCHOOL OF MEDICINE, COLLEGE OF
MEDICINE AND HEALTH SCIENCES, IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR SPECIALTY PROGRAM IN
DERMATOVENEREOLOGY.

By Asressie Mamo (MD)

Advisors:

Professor Wendemagegn Enbiale

Mr. Tebkew Shibabaw

October 2022

Bahir Dar

Declaration

This is to certify that the Thesis report entitled

“Pattern of skin diseases and associated factors in a primary hospital in Bahir Dar from June 2020 to May 2021, Ethiopia”, submitted in partial fulfillment of the requirements for specialization in department of Dermatovenereology, Bahir Dar University; is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates and that all the resources and materials used for the research, have been fully acknowledged.

Dr. Asressie Mamo Date- 25/10/2022 Bahir Dar

Principal Investigator


Name: Dr. Asressie Mamo (MD, Dermatovenereology Resident)

Signature: 

Date: 25/10/2022

Advisors

Name: Dr. Wendemagegn Eabiale. (Professor of dermatovenereology, MPH)

Signature: 

Date: 15/03/2015

Mr. Tebkew Shibabaw (MSc., Lecturer of Environmental Health Sciences)

Signature: 

Date: 25/10/2022

Dr. Yared Abebe
(Department Head)



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Last but not least I would like to thank dermatovenereology residents for their contribution in the data collection.

ABSTRACT

Background: Skin diseases are among the most frequent diseases affecting people of all ages, and cause a significant burden on patients and the healthcare system. The pattern of these diseases varies from country to country, region to region, and community to community due to different factors. However, there is no study showing a pattern of skin diseases and associated factors in the study area.

Objective: To assess the proportion of skin diseases and associated factors at a primary hospital in Bahir Dar from June 2020 to May 2021.

Method: A hospital-based, cross-sectional study was conducted. Applying Slovin's formula on study population of 2028, the sample size was calculated to be 338. A pre-designed data collection format was used to extract demographic and diagnostic information from the patients' medical cards and residents' logbooks. A systematic random sampling of the population data was performed. A pre-coded data was cleaned, entered into Excel, and exported in to SPSS 20 for analysis. Analysis was done using descriptive statistics. Chi-Square and Fisher's Exact Tests were used to determine the strength of association. The level of significance was set at a P value < 0.05 .

Result: In this study, the most common skin disease categories were dermatitis (23.0%), fungal infections (20.5%), bacterial infections (10.4%), scabies (9.6%), and pigmentary disorders (8.7%). Age, sex, and seasons have statistically significant associations with various skin conditions.

Conclusion: The study has shown the most common skin disease categories and specific skin diseases in the area of study. It has also demonstrated that variables including age, sex, and season have significant associations with various skin diseases. Knowledge of the extent of these skin disorders and associated factors is crucial for determining priorities for resources, developing public awareness campaigns and preventative measures in resource-constrained settings like ours.

Key words: Ethiopia, Proportion, Primary Hospital, Skin diseases.

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List of Abbreviation and Acronyms

AAPH	Addis Alem Primary Hospital
DALYs	Disability-adjusted life year
DVR	Dermatovenereology resident
DX	Diagnosis
HMIS	Health Management Information System
MD	Medical Doctor
NTD	Neglected tropical diseases
NGO	Non-Governmental Organizations
SPSS	Statistical Package for the Social Sciences
USA	United States of America
YLDs	Years lost due to disability

Chapter one

1. INTRODUCTION

1.1. Background

Skin diseases are thought to be among the most common diseases, affecting everyone from newborns to the elderly. (1, 2) For example, three skin diseases (fungal infections, other skin and subcutaneous diseases, and acne) are amongst the 10 most common diseases globally. (3)

The pattern of these diseases vary from country to country, region to region, and community to community due to genetic makeup differences, geographic location and environmental changes, occupational exposures, internal factors such as age and gender, socioeconomic differences and different cultural and religious practices. For instance, eczema has been reported to be predominant in developed countries and urban areas, whereas infections like bacterial, fungal and viral diseases and infestations are predominant in developing countries. (4)

Some skin diseases are exclusive to childhood, whereas others are found across all ages groups. Seasonal variations in certain skin diseases are a well known phenomenon. For instance, acne, folliculitis, and psoriasis are more prevalent in winter, whereas seborrheic dermatitis is more common in spring. (5)

Skin diseases impose a significant burden on a person's quality of life, including disruption in social relationships, low self-esteem, financial constraints, and, in some cases, mortality. (3)

In a global disease burden study (of 2013), skin conditions contributed 1.79% of the global burden of diseases, with individual skin diseases varying in size from 0.38% of total burden for dermatitis (atopic, contact, and seborrheic dermatitis), 0.29% for acne vulgaris, 0.19% for psoriasis, 0.19% for urticaria, 0.16% for viral skin diseases, 0.15% for fungal skin diseases, and 0.07% for scabies. (6)

To put things in perspective, skin conditions in 2013 ranked as the fourth leading cause of non-fatal burden expressed as years lost due to disability (YLDs) and as the 18th cause of disability adjusted life years (DALYs). YLDs from skin diseases are larger than those caused by diabetes mellitus and migraines, which emphasizes the importance of giving greater attention to skin conditions. The importance of giving greater attention for skin diseases goes beyond timely treating, preventing transmission of these diseases and ameliorating the sufferings caused by them as some skin manifestations are also clues to patient's internal diseases enabling the healthcare provider a timely management of other systemic diseases. (4)

Skin diseases account for a significant public health issue in developing countries and are assumed to affect a significant portion of the general public, but studies on the pattern or prevalence of these diseases are limited, despite some institutional-based studies here and there. Such studies may be affected by factors such as health-seeking behaviors, accessibility to health care and economic factors to reflect the actual prevalence of the different skin diseases at a community level, but they can give very important information for a good understanding of the burden of these diseases as community-based studies are often difficult to undertake . (7)

As the pattern of skin diseases differs from region to region and from community to community, and these diseases cause significant burden to the community and healthcare system, knowledge of the distribution of skin diseases within a region or within a community is important in helping to plan care, monitor changes with evolving socioeconomic conditions, and assess the effectiveness of strategies to improve overall health. (7, 8)

So, undergoing this study reveals somehow what the magnitude of the skin diseases is in this area or community rather than using one-size-fits-all assumptions. This is because the pattern of skin diseases varies from region to region and community to community due to the mentioned factors.

1.2. Statement of the problem

According to the WHO prevalence studies in developing countries, skin diseases affect 21-87% of the population. Problems with the skin are among the main reasons for seeking care, accounting for up to 24% of primary care visits, and are one of the most common causes of morbidity. (9)

Because of several factors, the patterns of skin diseases vary from country to country; from region to region, and even from community to community. (1, 8)

Based on the limited number of studies on the prevalence or pattern of skin diseases, the pattern of skin diseases in our country varies from region to region and community to community, but most of these studies have been in institutional settings (e.g., tertiary hospitals) and focused only on limited age groups (without considering the general public). In addition, most studies did not assess seasonal variations of the various skin diseases, save for one study done in Wolaita. (10)

In contrast to past studies, even if it is also an institutional-based study, this one examines the pattern of several skin diseases in people of all ages and explores their seasonal variations. By doing so, it reveals which skin diseases more commonly occurs in which age groups and in which seasons of the year, enabling directed therapies and preventive efforts.

Furthermore, this is the first research of its kind on the subject in the area. Therefore, this study determines the pattern of different skin diseases and associated factors presenting in a primary health care setting.

1.3. Significance of the study

Knowledge of the pattern of skin diseases presenting in a primary health care setting will serve as a proxy indicator for the burden of specific skin disease in the community, which will be helpful in expanding dermatologic services and educational programs on preventive measures as this study would show the magnitude of the skin diseases to public health professionals, physicians, health authorities, and policymakers.

1.4. Literature review

To tackle a certain problem, it is pretty necessary to know the magnitude of the problem. Conscious of this, various studies have been taking place in different parts of the world and in various parts of our country to determine the prevalence of different skin diseases. Most of the available evidences on the pattern of skin diseases have been based on hospital or private practice; and can provide a very crude indication of true prevalence and incidence in a community. (10)

The Global scenario

A population-based study done from August 2008-October 2011 which included 12,377 individuals aged 18 to 74 years from 5 European countries on the prevalence of dermatologic problems in adults concluded warts as the most common dermatologic condition (27.5%), followed by acne (19.2%), eczema, and contact dermatitis (15.0%). In general, females are more commonly affected compared to males with most skin diseases but skin cancers. (11)

In the USA, the prevalence of different dermatologic conditions varies as it is in different nations of the world. For example, the prevalence of psoriasis among US adults ages 20 years and older, as determined by a study involving 6228 participants selected by multistage stratification, is 3.2% with no difference between the sexes. (12)

In another study from Malaysia, the prevalence of psoriasis was 9.5%. It was more common in males (11.6%) than in females (7.2%). Patients within the 40-60 year age group had the highest (17.2%) rate and were lower in the younger age group, including those aged over 60 years (8.1%). (13)

A community-based study done in Iraq in 2009 involving 8000 individuals showed the overall prevalence of skin diseases to be 27%. The rate was similar in males (27%) and females (27%), and in rural (28%) compared with urban (26%) areas. Atopic dermatitis was more common in urban areas compared to rural areas. Dermatitis (33.2%) and infection (33.0%) were the most common categories. Cutaneous infections were more common in rural than urban areas. (14)

In a hospital-based study done in Turkey from January 2011 to January 2012 involving 11,040 patients; the three most commonly encountered diseases were acne (13.1%), dermatophytosis (8.5%) and contact dermatitis (8.5%), followed by urticaria (8.3%), psoriasis (5.5%), viral warts (4.1%), lichen simplex chronicus (3.0%), callus (2.2%), atopic dermatitis (2.2%), and seborrheic dermatitis (2.2%). The 3 most commonly encountered diseases were similarly distributed according to gender. With respect to age distribution, atopic dermatitis was most common from 0-9 years of age; acne between 10-29 years of age; urticaria, and seborrheic dermatitis from 20-39 years of age. (8)

In another hospital-based cross-sectional study done in Saudi Arabia from 2008 to 2009 over a one year period, involving 3051 patients, the most common skin diseases were found to be dermatitis 19.5%, viral infections 16.6%, pilosebaceous disorders 14.4%, and pigmentary disorders 11.2%. With regard to sex distribution, viral infections, papulosquamous diseases, and bacterial infections were more common in males compared to females; whereas, pigmentary and pilosebaceous disorders were more common in females compared to males. Concerning seasonal variation, this study demonstrated, pigmentary and papulosquamous disorders to be more common during winter and spring compared to autumn and summer. (5)

The African scenario

Across the different corners of Africa a number of studies to determine the prevalence of different dermatologic diseases have been undertaken through the ages. For instance, a community based cross-sectional study done in Egypt from 1994 to 1996 found that 86.93% of the total studied population had one or more skin diseases. In this study, parasitic skin infestations such as pediculosis capitis and fungal skin infections had the highest prevalence rate (27.40%), followed by dermatitis with a rate of 19.82% (pityriasis alba was the most common with a prevalence rate of 13.49%, followed by papular urticaria with 1.82% and atopic dermatitis

with 1.06%) and pigmentary disorders accounting for 17.68 % (lentigines with 7.46%, melasma with 3.23%, and vitiligo with 1.22%). Of fungal diseases, tinea pedis was the most common fungal infection with a prevalence rate of 7.96%, followed by tinea versicolor with a prevalence of 5.74%, and tinea capitis with a prevalence rate of 0.96%. Of bacterial infections, impetigo had a prevalence rate of 3.31%. In this study, viral skin infections constituted 2.31%, with warts having a prevalence rate of 0.97%. In general, most skin diseases were more common in females compared to males and in older age groups than in younger age groups, except for infectious diseases, which are more common in younger ones. (15)

In another community-based cross-sectional study in Tanzania's rural areas involving 1114 participants, done in 1994, the most common diseases were transmissible diseases, with specific diseases being scabies 15.5%, tinea capitis 1.2%, bacterial infections 5.2%, dermatitis 0.3%, vitiligo 0.9%, and psoriasis 0.3%. (16)

In a 1999 institutional-based cross-sectional study of 7029 patients in South Africa (five academic hospitals in Johannesburg), the most common skin diseases in the skin of color were eczema with 32.7% (seborrheic dermatitis with 32.7% , atopic eczema 17.9%, contact dermatitis 4.8%, and nummular 3.9%), acne (17.5%), and fungal infections with 5.7%. (17)

A hospital-based cross-sectional study in Ghana, done from January to December 2014 on 529 patients, found infections at 24.6% and dermatitis at 24.6% to be the most common skin diseases. With regard to specific dermatologic conditions, atopic dermatitis (8.4%), acne vulgaris (5.3%), scabies (5.1%), and lichen planus (5.3%) were the most common skin diseases. In this study, atopic dermatitis, scabies, and warts were more common in males compared to females whereas pityriasis rosea and lichen planus were more common in females. (18)

In another hospital-based cross-sectional study done from 2004 to 2016, involving 6374 individuals of age 18 or less in Nigeria, the most common disease categories were infections (26.1%), eczematous conditions (24.9%), infestations (13.6%), papulosquamous disorders (8.0%), and bullous disorders (3.7%). With respect to individual skin diseases, atopic dermatitis (15.1%) was the most common skin condition, followed by papular urticaria (10.2%), tinea capitis (8.1%) and vitiligo (3.5%). (1) Age-wise infectious diseases were more common in infants and adolescents, whereas eczematous disorders were most common among children less than 5 years old. (5)

A study in Ivory Coast showed the predominant diagnoses to be fungal infections (22.3%), followed by inflammatory skin diseases (6.9%). Of the fungal infections tinea capitis accounted for 11.6% and pityriasis versicolor for 11.4%. These diseases were more common in boys. (19)

In another hospital-based cross-sectional study done in Djibouti from 2018 to 2021, having 9114 patients, the prevalence of the main skin diseases was found to be scabies 12.83%, contact dermatitis 10.9%, dermatophytosis 7.93%, acne 4.29%, and tinea capitis 3.31%. Overall, infections were the most common accounting for 43.65%. In this study, females were more likely to have scabies, dermatophytosis, acne, contact dermatitis, and urticaria compared to males. With regard to age, these in age range of 20-39 years of age were more commonly affected by the five most common skin disease groups compared to others. (20)

The Local scenario

In Ethiopia, there is very limited information on the profile of skin diseases. Most of the studies are limited to urban areas or institutional settings. Although the ideal method for prevalence studies is the use of population-based field studies; many studies have been performed by examining the hospital application records of patients. (8)

For example, from June 1995 to July 1997, a total of 1505 patients were evaluated for different dermatologic conditions at Tikur Anbessa specialized hospital of Addis Ababa University, with the result of the most common skin diseases being allergic skin diseases (25.5%), infections (25.4%), photodermatitis (22.9%), and papulosquamous diseases (11.4%).

In this study, neurodermatitis was the most common allergic disease with 25.4%, followed by contact dermatitis (18.4%). Of the papulosquamous diseases psoriasis accounts for 4% and lichen planus for 15%. (21)

In hospital-based cross-sectional study done in Hawassa involving all 7727 patients who attended the dermatology clinic from January 2017 to December 2018, the most common skin disease was eczema with a rate of 35.4%, which was followed by infectious diseases at 23.3% (bacterial infections 8.7%), diseases of appendages 12.1%, papulosquamous diseases 8.75%, and pigmentary disorders 8.6%. With regard to specific skin diseases, atopic dermatitis occurs at a rate of 12.4%, psoriasis 3.7%, vitiligo 5.9%, and scabies 2.9%, among others. (4)

Based on another hospital-based cross-sectional study done in 2017 involving 317 participants in Finote Selam; the most common of skin disease was eczema at 29.5%. With 11.3%, fungal infections were the most common infectious skin problems, followed by bacterial infections with 8.6%. The rates of other diseases were found to be pigmentary at 11.9%, papulosquamous at 7.6%, pilosebaceous at 5.3%, and urticaria at 4.6%. With respect to individual skin diseases, atopic dermatitis was found to have a rate of 12.6% and tinea capitis at 3.6%. Almost two-thirds of skin diseases were from urban areas. (9)

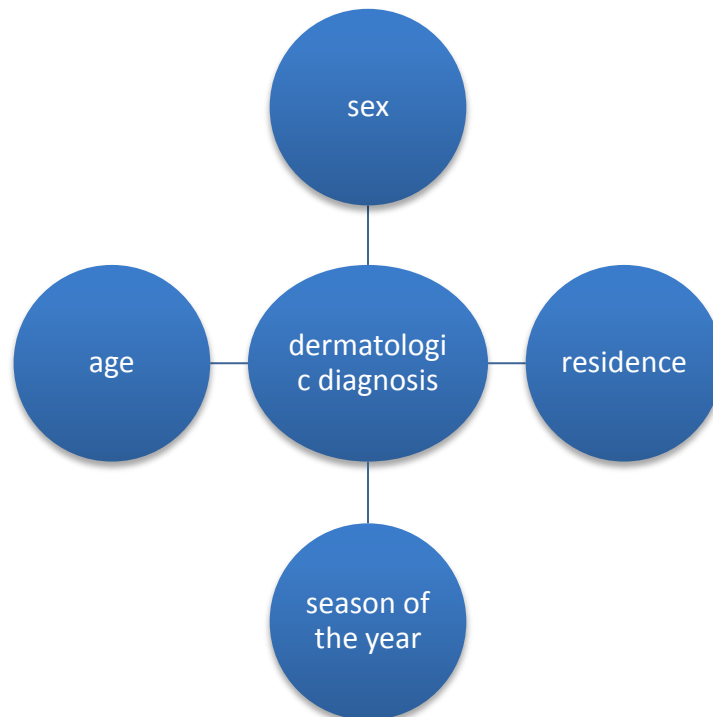
From a hospital-based cross-sectional study done in 2019 in Wolaita Sodo involving all children aged 15 or less, the five most common categories of skin diseases were eczema (23.9%), bacterial infections (21.3%), fungal infections (18.8%), infestations (9.9%), and pigmentary diseases (7.4%). Regarding individual diagnoses, impetigo was the most frequently presenting skin disease (13.8%), followed by tinea capitis (12.7%), atopic dermatitis (11.3%), and scabies (9.6%). This study also assessed seasonal variations of skin diseases. Accordingly, eczema, bacterial infections, and fungal infections increased during the autumn and winter seasons. (10)

In a scabies outbreak study in 2018 involving 1,125,770 people in the 68 districts in the Amhara region, a total of 379,000 confirmed cases of scabies were identified. The prevalence in the different districts ranged from 2% to 67%, and the median was 33.5%. 49% of cases were school-aged children. (22)

Overall, regarding the prevalence of specific dermatologic diseases, the available studies showed: scabies 2%-67%, higher in males compared to females and higher in rural than urban

areas ; atopic dermatitis 1.2-14.7% (24), higher in the urban (1.5%) than in the rural area(24, 25); tinea capitis 12.7%(10, 26), vitiligo3.6%(10), impetigo 13.8%(10, 27),folliculitis 2.4%, pityriasis Versicolor13.6%(21), seborrheic dermatitis 30%(21), acne 26% (21) and contact dermatitis 5.8%. Most of the available studies tried to show patterns of skin diseases with respect to demographic characteristics, but these studies either focused on a limited age group or a specific skin disease; only one study tried to assess the seasonal variation of a few skin conditions, in which dermatitis and bacterial infections were higher during the autumn and winter. (10)

Figure 1. Conceptual framework



Factors associated with skin diseases

Chapter two

2. Research Objective

2.1. General objective

To assess the pattern of skin diseases and associated factors seen in a primary hospital from June 2020 to May 2021 in Bahir Dar, Ethiopia.

2.1.1. *Specific objectives*

1. To determine the pattern of skin diseases presenting in primary hospital,
2. To identify the associated factors with the common skin diseases

Chapter three

3. Methods

3.1. Study design

A cross-sectional study using retrospectively collected routine hospital data was undertaken.

3.2. Study area

3.2.1. General setting

Ethiopia is a landlocked country in the Horn of Africa. It is the oldest independent country in Africa. The country covers an area of 1,126,829 km². A population of more than 114 million inhabitants (in 2020) makes the country the second-most populous nation in Africa behind Nigeria. The country comprises more than 80 ethnic groups and as many languages.

In Ethiopia, the climate varies mostly with altitude, and it goes from the hot and arid climate of the lowlands to the cool climate of the highlands. It has four seasons: summer, autumn, winter and spring.

3.2.2. Specific setting

Bahir Dar is the capital city of Amhara Regional State located northwest Ethiopia, with a population of 318,429 people, of which 85% live in the urban and 15% in the per-urban. It has nine sub-cities and 18 kebeles. The city is located approximately 578 km (360 miles) northwest of Addis Ababa, and has an elevation of 1,840 meters (6,036 feet) above sea level. There are 3 public hospitals, 4 private hospitals and 9 health centers in the city.

The study was done in Addis Alem Primary Hospital, which is located in Tedros Sub City/Abay Mado, Bahir Dar City. The hospital offers services in Dermatovenereology, Internal Medicine, Gynecology & Obstetrics, Psychiatry, Surgery, Pediatrics, and child health & Ophthalmology.

Dermatology service in Addis Alem Hospital:

The Dermatology clinic in the hospital started in May 2020 as an affiliation site for Bahir Dar University College of Medicine and Health Sciences. At the time of the study the clinics were functioning two days per week. The diagnoses were mainly made clinically (by dermatovenereology residents in consultation with a senior dermatovenereologist when needed), but basic laboratory investigations such as KOH tests, skin smear tests and gram stains were requested when necessary.

3.3. Source population

All patients who visit Addis Alem Primary Hospital for dermatologic care service.

3.4. Study Population

All patients who visited Addis Alem Primary Hospital from June 2020 to May 2021.

Inclusion and exclusion criteria

Inclusion criteria

These with a new dermatologic diagnosis with clear registration of diagnoses, address, age, sex, and date of hospital visit.

Exclusive criteria

These whose diagnoses, ages, addresses, sex, and date of hospital visit were not or were not clearly registered.

3.5. Sample size determination and Sampling technique

The sample size was determined using Slovin's formula for sample size determination for known population size of 2028.

$$n = \frac{N}{1 + Ne^2}; n = \frac{2028}{1 + 2028 * .05 * .05} = 338$$

e= precision (0.05)

The collected population data was arranged by random number generator using Microsoft Excel,

which was followed by systematic random sampling by applying the rand and mod functions to get the desired sample size of 338.

3.6. Study variables

Dependent variable

Skin diseases

Independent variables

Age

Sex

Residence

Seasons of the year (summer, autumn, winter and spring)

3.7. Operational definition and definition of terms

Pattern: refers to the proportion of diseases by place, person and season of the year.

Skin diseases: are diseases that affect the skin and its appendages.

3.8. Data collection procedure

Data on patient demographic information and diagnosis was captured from the patient hospital card and residents' logbook using a pre-developed data collection format.

3.9. Data quality assurance

The data was collected by the principal investigator from OPD patient registration book, medical records and the residents' logbook. This was validated against the Hospital Health Management Information System (HMIS). The data was checked for completeness and consistency and any gaps identified were corrected immediately.

3.10. Data processing and analysis

After data was checked manually for completeness and consistency, it was coded on Microsoft Excel; imported into SPSS 20 for further cleansing, coding, and analysis.

Before delving into the analysis, skin diseases were grouped into specific categories based on the available literatures, and dates of patients' hospital visits were used to define the seasons.

Descriptive statistics were done using proportion, frequencies, percentage, mean, median, minimum, and maximum, and cross-tabulation of the dependent variable with independent variables was done.

The significance of the association or relationship between the dependent and independent variables was ascertained using Pearson's chi-squared test of independence and the Fisher Exact Test as needed. The level of significance was set at a P value < 0.05 . The result was presented in texts, graphs and tables.

5. Ethical consideration

Ethical clearance was obtained from Bahir Dar University College of Medicine and Health Sciences Ethical Review Board. Permission was asked from Addis Alem primary hospital for the use of the routine data.

6. Dissemination of results

The final result of this study will be disseminated to Department of Public Health, Dermatovenereology Department, Research Coordinating Office and Hospital Administrative Office, and for publication of the research work.

7. Results

7.1. Sociodemographic characters of the patients attending Dermatology OPD at Addis Alem Primary Hospital from June 2020 to May 2021

In this study, a total of 338 patients were included.

The median age of patients was 19 years with standard deviation of 17.2 and minimum and maximum ages were 1 day and 80 years respectively.

Of the patients included 55.6% (188) were females and 44.4% (150) were males. 74.6 % (252) were from urban, 25.4% (86) were from rural areas.

7.2. Proportion of skin diseases of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

In this study, the most common skin disease categories were dermatitis (23.0%), fungal infections (20.5%), bacterial infections (10.4%), pigmentary disorders (8.7%), papulosquamous diseases(8.4%). With regard to specific skin diseases the most common were tinea capitis (11.2%), scabies (9.6%) , atopic dermatitis (7.9%), impetigo and seborrheic dermatitis (each with 5.6%), vitiligo (5.1%), psoriasis (4.5%) and acne vulgaris (4.0%). See Table 2.

Table 2 proportion of skin diseases of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Skin diseases	Frequency	Percentage
Total	356	100%
Fungal infection	73	20.5%
Tinea Capitis	40	11.2%
Tinea Corporis	14	4.0%
Pityriasis Versicolor	7	2.0%
Tinea pedis	4	1.1%
Cutaneous candidiasis	6	1.7%
Onychomycosis	2	0.5%
Scabies/infestation	34	9.6%
Dermatitis	82	23.0%
Atopic dermatitis	28	7.9%
Seborrheic dermatitis	20	5.6%
Allergic contact dermatitis	8	2.2%
Lichen simplex chronicus	8	2.2%
Pityriasis Alba	5	1.4%
Photo allergic contact dermatitis	5	1.4%
Irritant contact dermatitis	6	1.7%
Nummular Eczema	2	0.6%
Pigmentary disorders	31	8.7%
Vitiligo	18	5.1%
Melasma	8	2.2%
PIH	5	1.4%

Pilosebaceous disorders	17	4.8%
Acne vulgaris	14	4.0%
Rosacea	1	0.3%
Alopecia Areata	2	0.5%
Papulosquamous disorders	30	8.4%
Psoriasis	16	4.5%
Lichen planus	8	2.2%
Pityriasis Rosea	4	1.1%
Lichen Nitidus	2	0.6%
Bacterial infection	37	10.4%
Impetigo	20	5.6%
Folliculitis	8	2.3%
Furuncle	4	1.1%
Carbuncle	3	0.8%
Cellulitis	1	0.3%
Erysipelas	1	0.3%
Urticaria	7	2.0%
Papular Urticaria	5	1.4%
Chronic Spontaneous urticaria	2	0.6%
Neglected Tropical diseases (NTDs)	9	2.5%
Podoconiosis	4	1.1%
Leishmaniasis	4	1.1%
Yaws	1	0.3%
Others	36	10.1%
Viral infections	10	2.8%
Molluscum contagiosum	6	1.7%
Plantar wart	2	0.6%
Viral exanthema	2	0.6%
Keloid	5	1.4%
Actinic cheilitis	3	0.8%
Xerosis	4	1.1%
Keratoderma	3	0.8%
Melanoma	1	0.3%
Vascular diseases	5	1.4%
Infantile hemangioma	2	0.5%
Pyogenic granuloma	2	0.6%
Arteriovenous malformation	1	0.3%
Erythema nodosum	2	0.6%
Transient neonatal pustular melanosis	1	0.3%
Discoid lupus erythematosus	2	0.6%

7.3. Pattern of skin diseases with regard to sex, age, address and seasons of the year of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

7.3.1. Sex distribution of the skin disease categories among patients attending dermatology OPD at Addis Alem primary hospital in the study period

From the different types of skin disease categories, pigmentary disorders have been found to have a statistically significant association with sex being more common in females compared to males (23 vs 8 at p value = 0.029). See Table 3.

Table 3. Sex distribution of the skin disease categories among patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Category of skin disease	Sex			
	Total 344	Male Total diagnosis (DX) =158 % of total	Female Total DX = 198 % of total	P value
Dermatitis	82	33(21.0)	49(24.7)	0.387
Fungal infection	73	39(24.7)	34(17.2)	0.083
Scabies	34	16(10.1)	18(9.1)	0.740
Papulosquamous	30	18(11.4)	12(6.1)	0.071
Pigmentary	31	8(5.1)	23(11.6)	0.029*
Pilosebaceous	17	4(2.5)	13(6.6)	0.076
Bacterial infections	37	19(12.0)	18(9.1)	0.366
Urticaria	7	1(0.6)	6(3.0)	0.138
NTDs	9	7(4.4)	2(1.0)	0.083
Others	36	13(8.2)	23(11.6)	0.291

7.3.2. Age distribution of the skin disease categories among patients attending dermatology OPD at Addis Alem primary hospital June 2020 to May 2021

Fungal infections, urticaria and scabies were found to be more common in patients under 18 years of age (p values = 0.000, 0.039 and 0.011, respectively). Papulosquamous, pigmentary and pilosebaceous diseases were found to be more common in the age range of 18-40 years (p value = 0.015, 0.005, and 0.001, respectively); whereas, NTDs were more common in the age range of 41-60 years (p value = 0.001). These differences were statistically significant. See Table 4.

Table 4. Age distribution of the skin disease categories among patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Category of skin diseases	Age					P value
	Under 18 (total = 169) % from total	18-40 (total = 149) % from total	41-60 Total DX = 37 % from total	Above 60 n = 1 % of total	Total	
Dermatitis	29(17.2)	43(28.8)	10(27.0)	0	82	0.076
Fungal infection	53(31.4)	19(12.8)	1(2.7)	0	73	0.000*
Scabies	24(14.2)	10(6.7)	0	0	34	0.011*
Papulosquamous	7(4.0)	17(11.4)	6(16.2)	0	30	0.015*
Pigmentary	6(3.6)	20(13.4)	5(13.5)	0	31	0.005*
Pilosebaceous	2(1.2)	15(10.1)	0	0	17	0.001*
Bacterial infections	24(14.2)	11(7.4)	2(5.4)	0	37	0.145
Urticaria	5(3.0)	0	2(5.4)	0	7	0.039*
NTDs	2(1.2)	2(1.3)	4(10.8)	1(100)	9	0.001*
Others	17(10.0)	12(8.1)	7(19.0)	0	36	0.194

*Significant (P < 0.05)

7.3.3 Address distribution of skin diseases of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

The various skin disease categories have been found to have no statistically significant association with the addresses of patients. See Table 5.

Table 5. Address distribution of skin diseases of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Category of skin diseases	Address			
	Urban (n = 266) % from n	Rural (n =90) % from n	Total	p-value
Dermatitis	58(21.8)	24(27.7)	82	0.361
Fungal infection	60(22.6)	13(14.3)	73	0.099
Scabies	27(10.2)	7(7.7)	34	0.493
Papulosquamous	23(8.6)	7(7.7)	30	0.781
Pigmentary	19(7.1)	12(13.3)	31	0.075
Pilosebaceous	15(5.6)	2(2.0)	17	0.257
Bacterial infections	30(11.3)	7(7.7)	37	0.334
Urticaria	6(2.3)	1(1.1)	7	0.683
NTDs	4(1.5)	5(5.4)	9	0.050
Others	24(9.0)	12(13.3)	36	0.250

*Significant (P < 0.05)

7.3.4. Association among skin disease categories and season of the year of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Skin disease categories like dermatitis were found to be more common during summer and winter (p value = 0.017), and bacterial infections were more common during autumn and winter (p value = 0.013). These associations are statistically significant. See Table 6.

Table 6. Association among skin disease categories and seasons of year of patients attending dermatology OPD at Addis Alem primary hospital from June 2020 to May 2021

Category of skin diseases	Seasons of the Year					P value
	Total	Summer (Total = 65) % from total	Autumn (Total = 93) % from total	Winter (Total = 98) % from total	Spring (Total = 100) % from total	
Dermatitis	82	22(33.8)	16(17.2)	26(26.5)	18(18.0)	0.013*
Fungal infection	73	15(23.1)	23(24.7)	16(16.4)	19(19.0)	0.705
Scabies	34	6(9.2)	11(11.8)	8(8.2)	9(9.0)	0.956
Papulosquamous	30	4(6.2)	3(3.2)	10(10.2)	13(13.0)	0.050
Pigmentary	31	8(12.3)	8(8.6)	7(7.2)	8(8.0)	0.674
Pilosebaceous	15	4(6.2)	2(2.2)	4(4.1)	7(7.0)	0.319
Bacterial infections	37	2(3.1)	17(18.2)	12(12.2)	6(6.0)	0.013*
Urticaria	7	0(0.0)	2(2.2)	2(2.0)	3(3.0)	0.638
NTDs	9	1(1.5)	2(2.2)	2(2.0)	4(4.0)	0.803
Others	36	3(4.6)	9(9.7)	11(11.2)	13(13.0)	0.322

*Significant ($p < 0.05$)

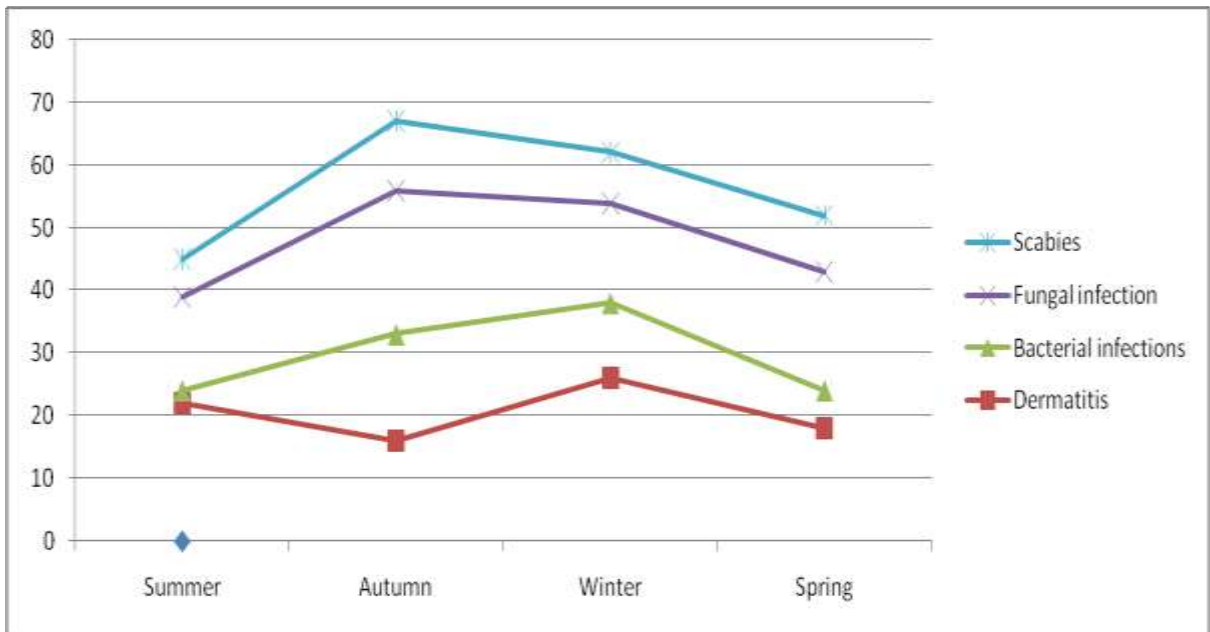


Figure 2. Graphic demonstration of seasonal trend of selected skin disease categories

8. Discussion

The pattern or prevalence of skin diseases differs from community to community, region to region, and country to country due to a variety of factors, including genetic makeup variations, geographic location and environmental changes, occupational exposures, internal factors like age and gender, socioeconomic differences, and various cultural and religious practices.

In light of this, the study has evaluated the pattern of various skin problems in the study area and their association with various factors, as was its initial goal.

The study found that dermatitis (23.0%), fungal infections (20.5%), bacterial infections (10.4%), scabies (9.6%), pigmentary diseases (8.7%), and papulosquamous illnesses (8.4%) are the most common skin diseases in the study area.

Regarding specific skin diseases, the most common were tinea capitis (11.2%), atopic dermatitis (7.9%), impetigo and seborrheic dermatitis (each with 5.6%), vitiligo (5.1%), psoriasis (4.5%) and acne vulgaris (4.0%).

The findings regarding dermatitis are consistent with the findings of studies done in Addis Ababa 25.5%(21), Wolaita Sodo 23.9%(10), Mekelle 24.7%(27), Nigeria 24.9%(1), Turkey 21.8%(8), and Saudi Arabia 19.7%(9), but it was lower compared to rate of dermatitis in Finote Selam 29.5%(9), Hawassa 35.4%(4), Iraq 33%(14) & South Africa 31%(17). The proportion of atopic dermatitis, the most common of dermatitis group, was 7.9% in this study, which was in line with studies in Mekelle at 7.5%(27), and Iraq at 7.5%(14) but was higher than in Egypt 1.06% (15), and lower than that in Finote Selam 12.6%(9), Hawassa 12.4%(4), Addis Ababa 14.7%(21), Wolaita 11.3%(10), Nigeria 15.1%(1), and South Africa 25.6%(17). Such variations may result from inherent genetic variations, seasonal and environmental influences, or both.

The second most common of dermatitis category was seborrheic dermatitis with 5.6% which is consistent with Iraq 5.2% (14) but higher than in Wolaita 1.2%(10), Mekelle 2%(27),

Tanzania 0.3%(16), Turkey 2.2%(8) and lower than in South Africa 52.2%(17). These differences may be due to different age range of study groups and environmental factors.

Regarding the proportion of fungal infections, it was in keeping with study in Mekelle 20.7%(27), Wolaita 18.8%(10) & Ivory Coast 22.3%(19) but it was higher than in Finote Selam 11.6%(9), Hawassa 9.5%(4), Egypt 16.17%(15), South Africa 5.7%(17), Iraq 11.1%(14), and Turkey 11.1%(8). *Tinea capitis*, the most frequent fungal skin infection, occurs at a rate similar to that of Wolaita, 12.7%(10), Nigeria at 8.1%(1) and the Ivory Coast at 11.3%(19), but greater than that of Tanzania (4.3%)(16), and Iraq at 2.5%(14). This difference may be explained by variations in the climate (hot and humid conditions increase the risk of acquiring fungal infection), and socioeconomic and hygienic factors.

The proportion of bacterial infections was comparable to that found in Hawassa 8.7%(4), Finote Selam 8.6%, Mekelle 12.1%(27), Wolaita Sodo 13.8%(10) and Egypt 10.10%(15), but it was greater than that found in Tanzania 1.6%(16), Djibouti 4.7%(20), South Africa 4.4%(17), Turkey 1.5%(8), while it was lower than that found in Addis Ababa 27.7%(21). According to this study, impetigo had a proportion of 5.6%, which is consistent with data from Iraq at 6.7%(14), but higher than in Turkey at 1.6% (8) and lower than in Wolaita at 13.8%(10), and Egypt at 27.7%(15). This difference can be explained by differences in times of the studies, socioeconomic and educational status, personal habits, and hygienic conditions.

Regarding the proportion of scabies, it was consistent with studies conducted in Wolaita Sodo at 9.9%(10), Dabat at 9.3%(23), Mekelle at 10.3%(27), and Djibouti at 12.8%(20), but was higher than Turkey at 1.5%(8), and lower than Tanzania at 15.5%(16). This variation may be explained by the study's season, the environment, crowding, socioeconomic and educational status, access to healthcare services, hygiene behaviors, sample size, and length of the study.

As far as pigmentary diseases are concerned, they were the fifth most common skin disease with 8.7%, which was comparable with studies in Mekelle 8.3%(27) and Wolaita 7.4%(10). The most common pigmentary disorder in the study area was vitiligo at 5.1%, followed by melasma with 2.1%. These findings for vitiligo were comparable to findings in Hawassa 5.9%(4), Mekelle 3.4% (27) and Nigeria 3.5%(1) but it was higher than Tanzania 0.9%(16), Turkey 1.2%(8), and Egypt 1.22%(15). The reason for such differences may have to do with the sample size and study areas.

Lastly, the proportion of papulosquamous diseases was consistent with studies done in Addis Ababa 11.4%(21), Hawassa 8.75%(4), Finote Selam 7.6%(9), Nigeria at 8.0%(1) and Turkey at 9.2% (8),but it was higher compared to findings in Wolaita Sodo at 2%(10), and Iraq at 3.7%(14). Psoriasis was the most common papulosquamous disease with 4.5%, which was consistent with studies done in Addis Ababa at 4.4%(21), Turkey at 5.5%(8), but was higher than these done in Wolaita at 0.8%(10), Tanzania at 0.3%(16), and Iraq at 2.3%(14).The age range of the participants in the study, the study area, and the study methodology may all have an impact on this discrepancy.

In this study, the factors considered have been found to have variable significant associations with various skin diseases. This is presented as follows, and its context with respect to the body of existing literature is evaluated.

This study showed that pigmentary skin diseases were more likely to occur in females compared to males. The other skin diseases did not have a statistically significant association with the sex of patients. With regard to pigmentary disorders, it is in line with findings of studies done in Mekelle(27) and Saudi Arabia(9), but in the these studies, papulosquamous and bacterial skin diseases were more common in males compared to females. This difference may have to do with differences in sample sizes among the studies and high health-seeking tendencies in females for cosmetic concerns.

With regard to age, this study found that fungal infections, urticaria, and scabies were more likely to occur in individuals under the age of 18. Papulosquamous, pigmentary, and pilosebaceous disorders were more common in the age range of 18–40 years, whereas NTDs were more common in the age range of 41–60 years.

These findings are consistent with studies in Addis Ababa(21), Mekelle(27) and Turkey(8), although a European study that disagrees with this one found that urticaria and pigmentary skin illnesses (vitiligo) did not vary with age. (11)

This difference may be explained by differences in socioeconomic status and genetic factors.

In terms of the association of skin diseases with a place of residence, this study revealed no statistically significant associations among skin diseases and address. This is in stark contrast to

most available studies, which show several of the skin diseases including eczema to be more common in urban areas and cutaneous infections more in rural areas. (14) One explanation could be the difference in sample size and ease of access to healthcare.

Regarding seasonal association, the study showed dermatitis diseases were more common during summer and winter, and bacterial infections in autumn and winter. This is in agreement with a study done in Wolaita(10) and Saudi Arabia(5).

9. Strength and Limitations of the study

Strengths

In this study, the diagnoses were made by dermatology residents and consultants, which reduces diagnosis subjectivity.

Limitations

In addition to the studied factors, there are a number of factors that affect the pattern of skin diseases, some of which were not included as the study used secondary data, and it would have been better if the study period had been over 2 or more years for a better assessment of seasonal variation. The other limitation is that the study was hospital-based and, as such, may not represent the real picture of the conditions in the community.

10. Conclusion

This study aimed to determine the pattern of skin diseases and associated factors in the study area. To that end, the most common skin diseases in the study area have been found to be dermatitis, fungal infections, bacterial infections, pigmentary disorders, and papulosquamous disorders. Of specific skin diseases, the most common were tinea capitis, scabies, atopic dermatitis, impetigo and seborrheic dermatitis, vitiligo, psoriasis, and acne vulgaris.

The study also showed that skin diseases have association with factors like age, sex, and seasons of the year. In resource-constrained settings like ours, knowing the magnitude of these skin diseases and associated factors is of paramount importance in prioritizing resources, developing public education programs and preventive methods.

10. Recommendation

Based on the findings and the conclusion presented, the following recommendations are suggested:

To health professionals:

Since the prevalence of skin diseases differ from country to country, region to region and from community to community; they should be aware of this during their practice.

To health officials and hospital administrators: they should be able to make medications available for the early treatment of these common diseases.

To future researchers: additional studies are needed to explore other associated factors and better define the prevalence of skin diseases using primary data, especially in the community setting.

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Annex 1. Ethical clearance

I am Dr. Asressie Mamo, a third -year dermatovenereology resident in Bahir Dar university college of medicine and health sciences, I would like to apply to your office to have ethical clearance to conduct a research on Pattern of skin Diseases and associated factors at primary Hospital in Bahir Dar from June 2020- May 2021,;as partial fulfillment for the requirement of specialty program in dermatovenereology. Data will be extracted from registered patient records; confidentiality of records will be kept. The results of this research will show pattern of skin diseases and associated factors evaluated at dermatology outpatient department of Addis Alem Primary Hospital from June 2020- May 2021.

Annex 2. Data Collection Tool/Format

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