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ORIGINAL ARTICLE

PATTERN OF SKIN DISEASES IN CHILDREN ATTENDING THE DERMATOLOGY CLINIC IN ALERT REFERRAL HOSPITAL, ADDIS ABABA, ETHIOPIA: A RETROSPECTIVE STUDY

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ABSTRACT

Background: *A Skin disease, which is estimated to affect between 21 and 87% of children, are the reason for up to a third of outpatient visits to pediatricians and dermatologists. It can possibly result in considerable anxiety, parental worry, and embarrassment to the child and lead to loss of confidence, disruption of social relations, and feeling of stigmatization. This study aimed to assess the pattern of skin diseases in children attending at ALERT referral hospital.*

Methods: *The study setting is ALERT referral hospital, Addis Ababa, Ethiopia. A hospital-based, retrospective, cross-sectional descriptive study was carried out between July and August 2020. All children younger than 12 years, who were diagnosed for skin diseases from May 2018 to May 2020, were included. Four hundred twenty-three children were sampled using a random sampling method. SPSS Version 20 software was used for data analysis.*

Results: *The results showed that 385(91%) of patients had one skin disease and the remaining 38(9%) had two or more skin diseases. Fungal infections were present in30.1% of the cases followed by eczema, which accounted for 27.4%. Among fungal infections, Tinea Capitis (106/116), 91.4% followed by Tinea Corporis and Tinea Pedis were the most common in ALERT dermatology clinic. Among eczema cases, family atopic dermatitis (82/106), 77% was the most common. The result showed seasonal variation in some diseases.*

Conclusion: *Skin fungal infections were the most common followed by eczema, pigmentary disorder, infestation, viral infection, urticaria, bacterial infection, and others. There was some seasonal variation in some diseases.*

Keywords: Pediatrics, Skin diseases, Hospital-based, Retrospective Cross-sectional descriptive study

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INTRODUCTION

Skin provides important functions, including protection from external insults and micro organisms, temperature modulation, and synthesis of vitamin D (1,2). Skin diseases refer to disorders of predominantly the superficial layers of the skin dermis and epidermis. Skin diseases including allergic inflammatory, eczema, bacterial infections, fungal infections, infestations, and viral infections were the repeatedly observed dermatology findings in different studies done in the pediatric age (3–7).

Around the world, skin diseases have invigorated a ton of interest over the years because they are common and possibly preventable and controllable (1,2). In developing countries, skin diseases represent the greatest public health care problem and are a major cause of morbidity(8). In Africa, skin diseases are seen in 21 to 87% of children and are the justification for up to 33% of visits to pediatricians and dermatologists (3).Another study revealed that the overall point prevalence of any skin disease was found to be 58.3% (9).

The increasing frequency of pediatric skin diseases represents a substantial part of morbidity in children. However, only a few data extracted from few studies are currently available about the epidemiology of pediatric skin diseases with an example of allergic and inflammatory skin disease (45.73%) followed by infection (20.1%) (3). The pattern of skin diseases varies from one country to another and even from one district to another inside the same country because of natural variables, hygienic standards, social traditions, and hereditary (10,11).

Generally, the information available on the prevalence and incidence of common skin diseases is scarce. In developed countries, eczematous skin diseases are the most common among children (3), whereas in most developing countries infections and infestations are predominant (12,13). For example, study in Nigeria, Bangladesh, India, Brazil, Tanzania, and Egypt showed various patterns of skin diseases even though infectious causes are the most common among school children (10–12,14,15).

In Ethiopia, there is extremely limited data on the profile of skin diseases in children. In a cross-sectional, hospital based study in Ethiopia, the most common skin diagnoses in youngsters under five were infestations like scabies and pediculosis, pyoderma, fungal infections, and eczema (16). One more study in a large metropolitan clinic in northern Ethiopia showed eczema as the most common diagnosis but it included grown-up patients (17). A community survey in south-west Ethiopia had a restricted scope yet found parasitic infestations as most common(18). Another study on pattern of skin diseases at a tertiary referral hospital in Addis Ababa showed allergic skin diseases were most frequent followed by infections and photo dermatitis, however this examination was done from 1995 to 1997 (19). A recent study conducted in Wolaita Sodo on patterns of skin disease showed that eczema (23.9%), bacterial infections (21.3%),

fungal infections (18.8%), infestations (9.9%), and pigmentary disorders (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%). One case of podocinids and one of the folliculitis decalvans were also identified and merged as "other" in the category of miscellaneous diseases and 65% of skin diseases were from urban areas(20).

There were limited recent data regarding patterns of skin diseases among children inthe study area. So, our study aimed to assess the pattern of skin diseases in children attending at ALERT referral hospital, Addis Ababa, Ethiopia. Specific objectives included describing the socio demographic characteristics of common skin diseases, evaluating family history, and examining seasonal variations in skin diseases. The finding of this study will guide public health planners and implementers in planning and designing appropriate intervention strategies.

MATERIALSAND METHODS

Study Area: The study setting is ALERT Hospital which is one of the specialized tertiary referral hospitals in Ethiopia. It is located in Addis Ababa. ALERT Hospital was established in 1934 to serve persons affected by leprosy. The hospital currently provides a wide range of services in various departments. These includes emergency, gynecology, general OPD, ART & TB, psychiatry and counseling, dermatology and others. Daily about 900 - 1200 patients are treated who come from all over the country. Pediatric dermatology clinic working five days per week and about 40 patents per day from this the new patient accounts for nearly 15 cases. Currently, there are 22 dermatovenereologists (Addis Ababa University and ALERT staffs) and 42 resident dermatovenereologists working in the dermatology clinic of the hospital.

Study Period: The study was conducted between July and August 2020. Hospital-based retrospective cross-sectional descriptive study design was employed.

Study Population: All children having skin disease age less than 12 years who were seen at dermatologic clinic from May 2018 to May 2020 were included.

Sample size and Sampling Procedures: The source of data was the hospital dermatology outpatient register. A uniform data abstraction sheet was prepared to collect the relevant data from the patient chart. Children whose charts are lost and incomplete were excluded from the study. Asingle population proportion formula was employed. The study took50 % prevalence to include more numbers of cases. The formula gives sample size of 384, considering 10% incompleteness the final sample size is 423 patients. A systematic random sampling method was applied to get those samples. Estimating a total of about 7800 cases to be found in the study period by taking approximately 15 patients per day for 5 days in a week, but due to some inconsistencies, only 5633 patients were included in the study.

All cases were arranged in order serially from the beginning of the study period to the end. K -value was calculated as 5633/423 =13. So, every 13th observation was included in the study.

Variables: The dependent variable for this study was the pattern of skin disease. The independent variables were socio-demographic factors, age, sex, residence, seasonal variation, associated factors (self-history atopy, itching in the family, family history of atopy, and family history of asthma).

Data Collection and Data Analysis: Structured data collection tools were adopted. Datawere collected by trained General Practitioner using chart review and registration logbook (HMIS).The variables collectedfrom patients chart by including age, sex, residency, date of diagnosis,diagnosisand other study variables.The data were coded and cleaned before analysis. Data were entered by EpiData (version 4.2.0.0) and analyzed using SPSS Version 20. Descriptive statistics were used to describe pattern of skin disease. Tables and graphs were used to present the results.

Ethical Consideration: Approval from Addis Ababa University, college of Health Science, Department of pediatrics, and child health research and publicationcommitteewas received beforecommencement to the study.

RESULTS

Socio-Demographic Characteristics of Child

There were 423 pediatric patients card assessed retrospectively about the pattern of skin disease diagnosed at the dermatology outpatient department. Their socio-demographic characteristics are shown below in Table 1. There were slightly more males than females and most patients came from the urban area of Addis Ababa. One hundred twenty three (29.1%) pediatric patients were aged less than one year with an equal percentage of age distribution 111 (26.2%) in preschool (2-5 years) and school age (6-10 years)

Table 1: Demographic characteristic of pediatric patients attending dermatology department at ALERT Hospital, Addis Ababa, Ethiopia

Variables	Category	Frequency	Percent
Age of children in year	Infant (<=1years)	123	29.1
	Toddler (1-2 years)	62	14.7
	Preschool (2-5 years)	111	26.2
	School Age (6-10 years)	111	26.2
	Adolescent (> 10years)	16	3.8
Sex	Male	222	52.5
	Female	201	47.5
Residency	Urban	335	79.2
	Rural	88	20.8

Number of Skin Diseases Diagnosed By Physician

The result showed that most of the 385 patients (91%) had diagnosesof one skin disease while the rest 38 (9%) had two or more skin diseases at the same time.

Categories of skin diseases frequency and proportion

Of those patients with one skin condition 385 (91%), fungal infections were116 (30.1%) followed by eczema 27.4% as shown in Table 2 below. The least frequencies were papulosquamous and miscellaneous disorder each accountingtwo (0.5%) and three (0.8%) values respectively.

Table 2: Frequencies and proportion of skin diseases among pediatric patients attending dermatology department at ALERT Hospital, Addis Ababa, Ethiopia

Single skin disease diagnosis (n= 385)		
Category of skin disease	Frequency	Percent
Fungal infection	116	30.1
Candidiasis	1	0.3
Onychomycosis	2	0.5
Tinea Corporis	3	0.8
Tinea Capitis	106	27.5
Tinea Faciei	1	0.3
Tinea Pedis	3	0.8
Eczema	106	27.5
Atopic dermatitis	82	21.3
Eczema	2	0.5
Infantile Seborrehic Dermatitis	22	5.7
Pigmentary disorder	45	11.7
Pytriasis Alba	24	6.2
Vitiligo	21	5.7
Infestation	42	10.9
Scabies	41	10.6
Myiasis	1	0.3
Viral infection	26	6.8
Molluscumcontagiosum	20	5.2
Wart	6	1.6
Urticarial	21	5.5
Pupular Urticaria	21	5.5
Bacterial infection	16	4.2
Pyoderma	16	4.2
Pilosebaceous disease	5	1.3
Acne	5	1.3
Protozoal infestation	4	1
Cutaneous Leishmaniasis	2	0.6
Mucocutanious Leishmaniasis	1	0.3
Miscellaneous disorder	3	0.8
Keloid	3	0.8
Papulosquamous	2	0.5
Psoriasis	2	0.5

Multiple skin conditions in same patients

Multiple skin diseaseswere diagnosed in 38 (9%) patients. From those with multiple skin diseases, six (15.8%) developed more than one fungal infection 4 (10.5%), and pigmentary disorder as shown in Table 3 below.

Table 3: Children having more than one skin disease diagnosed at ALERT Hospital, Addis Ababa, Ethiopia

Experience of more than one skin disease diagnosis	Frequency	Percent
Bacterial infection and fungal infection	2	5.3
Bacterial infection and eczema	1	2.6
More than one fungal infection	6	15.8
More than one pigmentary disorder	2	5.
Urticaria and viral infection	1	2.6
Eczema and viral infections	2	5
Eczema and fungal infection	1	2.6
Eczema and infestation	4	10.5
Eczema and infestation and fungal	1	2.6
Eczema and pigmentary disorder	2	5.3
Fungal infection and infestation	4	10.5
Fungal infection and viral infection	3	7.9
Fungal infection and pigmentary disorder	4	10.5
Fungal and bacterial and infestation	1	2.6
Pigmentary disorder and infestation	2	5.3
Viral infection and pigmentary disorder	2	5.3
Total	38	100.0

Table 4: The pattern of single skin disease regarding child age diagnosed at ALERT hospital, Addis Ababa, Ethiopia

Pattern of Skin Disease	<1years	1-2 years	2-5 years	6-10 years	>10 years	Total
Bacterial Infection	5	4	4	3	0	16
Eczema	57	20	17	12	0	106
Fungal Infection	14	7	47	44	4	116
Infestation	18	9	5	8	1	41
Miscellaneous Disorder	1	0	1	0	1	3
Papulosquamous	0	0	1	0	1	2
Pigmentary Disorder	5	5	11	20	4	45
Pilosebaceous Disease	1	1	0	3	0	5
Protozoal Infestation	3	0	0	0	1	4
Urticaria	9	6	4	2	0	21
Viral Infection	5	3	7	10	1	26
Total	118	55	97	102	13	385

Family History of Skin Disease

From patients in this study,(22/423) 5.2% of them had family history of the same skin disease and (35/423) 8.04% had a history of itching and (30/423) 7.1% had a history of atopy as shown in Table 5 below

Table 5: Family history of Skin disease history characteristics

Family History	Skin Disease	Frequency	Percent
Having Family History of the Same Skin Disease (N=22)	Fungal infection	12	54.5
	Eczema	6	27.3
	Fungal infection & infestation	1	4.5
	Pigmentary disorder	1	4.5
	Urticaria& viral infection	1	4.5
	Viral infection	1	4.5
History of Itching in the Family (N=35)	Scabies	19	54.3
	Scabies & Atopic Dermatitis	4	11.4
	Atopic Dermatitis	4	11.4
	P. urticaria& MC	1	2.9
	Tinea capitis & scabies	4	11.4
	Impetigo & Atopic Dermatitis	1	2.9
	P. Alba	1	2.9
	Urticaria& viral infection	1	2.9
Family History of Atopy (N=30)	Atopic Dermatitis	22	73.3
	Atopic Dermatitis &Tinea capitis	1	3.3
	P. urticaria & mc	1	3.3
	Tinea capitis	4	13.3
	Tinea pedis	1	3.3
	Vitiligo	1	3.3
Family History of Asthma(N=20)	Atopic Dermatitis	12	60
	Candidiasis	1	5
	Impetigo	1	5
	P. alba	1	5
	Urticaria & MC	1	5
	Scabies	1	5
	SD	1	5
	Tinea capitates	1	5
	Wart	1	5
Child History of Atopy (N=5)	Atopic Dermatitis	5	100

Seasonal Variation of Skin Diseases

This study identified seasonal variation in the pattern of skin diseases. The seasons were related to Ethiopian seasons. According to the Ethiopian National Meteorological Services Agency (NMSA) Ethiopia has four seasons based on the average trends of the weather and rainfall: **Kiremt (meher)** - June, July and August are the summer season. Heavy rain falls in these three months, **Tseday (spring)** - September, October, and November are the season sometime known as the harvest season, **Bega (winter)** - December, January, and February are the dry season with frost in the morning especially in January, and **Belg (autumn)** - March, April, and May are the autumn season with occasional showers. May is the hottest month in Ethiopia. The study showed that fungal skin disease was more common in summer and less common in spring as shown in figure 1 below. The same works for other types of skin disease patterns.

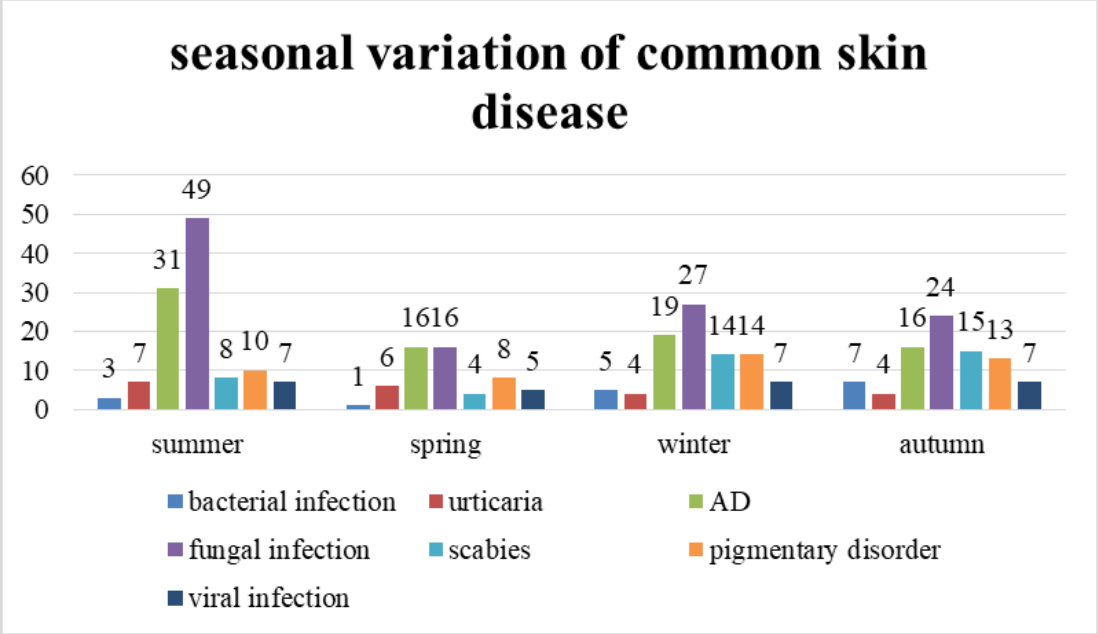

Figure 1: Seasonal variation of the most common skin diseases categories among pediatric patients attending dermatology department at ALERT Hospital in Addis Ababa, Ethiopia

DISCUSSION

One hundred twenty three123 (29.1%) patients were aged less than one year and with an equal percentage of age 111 (26.2%) from 1-2 years and 2-5 years. Mostpatients 385 (91%) were diagnosed to have one skin disease while 38(9%) had two or more skin diseases. This result conforms to most of the findings in other studies(3,4,23,5–7,9,19–22). From this study, fungal infection has a 30.1% proportion followed by Eczema that accounts for 27.4%. Of the fungal infection, which includes Tinea Capitis, Tinea Pedis, Tinea Corposis, Onychomycosis, Candidiasis, and Tinea Faciei, the most common were Tinea Capitis (106/116), 91.4% followed by Tinea Pedis.

Besides, that from the eczema family atopic dermatitis (82/106), 77% was the most common. This pattern is similar to studies conducted in Illubabore, Ethiopia, Tanzania, Egypt, Pokhara, Nigeria, and Northern India (5–7,9,21,22). However, there are other findings which showed different patterns of skin diseases such as those described in Mekelle, Addis Ababa, Dabat, Wolita Sodo, Switzerland, and Turkey (3,4,17,19,20,23,24). Atopic dermatitis was the most common from the allergy family in these studies. The differences may be due to differences in geographical location, sample size, duration of the study, study design, different patient age limits, and socioeconomic status. In particular, other studies were based on outpatient populations, which were different fromours that is a hospital-based study.

Concerning the relationship between skin disease and age group, forage group less than 1 year, 57 (48.3 %) eczema was the mostcommon skin disease followed by 18 (15.3%) infestation.For ages between 1-2 years, 20 (36.4%) eczema is common skin disease-followed by infestation, fungal infection and urticaria. For ages between 2-5 years, 47 (48.4%) fungal infections were recorded followed by 17 (17.5%) eczema, pigmentary disorder, viral infection and infestation with least value of Pilosebaceous Disease and Protozoal Infestation. For ages between 6-10 years, 44 (43.1%) fungal infections were recorded followed by 20 (19.6%) pigmentary disorder with least value of papulo-squamous, protozoal infestation, and miscellaneous disorder besides the same skin disease pattern as shown in the table above for age greater than ten. This result was the same to study conducted in Fulbari, Egypt, India, Tanzania and other places, since they got infection was the case where patients mostly exposed (5–7,9,21,22). But different from other studies since they reported that contact dermatitis and scabies were the most common skin disease in that area (3,4,19,20,23).

Based on gender, it was found that skin disease type in male 27 (66%) infestation and 61 (58%) eczema were the most common. However, for female gender 18 (69%) viral infection is common. More or less this result conforms to the study finding in Aargau, Switzerland on the epidemiology of dermatology that showed Pigmented nevi and eczema were more common in males (3).

Based on the geographical location, 335 (79.2%) were from urban and 88(20.8%) from rural areaswhich is consistent with a study done in another part of Ethiopia (18). This undoubtedly reflects easier access to health care. It was found that skin disease type in urban areas 95 (32%) fungal infection and 82 (28%) eczema were the most common but bacterial infection was rare. However, in rural areas, 24 (33%) eczema and 21 (29%) fungal infection skin disease type are common but urticaria, viral infection, and bacterial infection were rare. This study deviate from report results in Northern Ethiopia which found eczema to be the most common diagnosis however the study included adult patients (17).

The findings of skin types based on age groups are as expected in the literature. Infections such as protozoal infections, fungal infections are more common in older children who start to go outside the home. Eczema and urtical are expected to be common among infants similar to our findings, even though we cannot make conclusions as the numbers are small.

This study showed that fungal infection had higher value in summer and winter but the low value in spring. With changes in seasons, there can be variation in temperature, humidity, ultraviolet rays, wind, atmospheric pollen allergens, and humidity that can have an impact on epidermal barrier function (19).

Of allpatients in this study (22/423), 5.2% of them had the same skin disease of family history which accounts for 12 (54.5%) of them had fungal infection followed by six (27.3%) eczema. Of patients (35/423), 8.04 %) had a history of itching in their family with the most common disease 19 (54.3%) scabies. (30/423, 7.1%) had a history of atopy in their family and 22 (73.3%) of them had AD. Of patients, having family history of asthma, 12 (60%) had also AD as the most common disease in their family. The child history of atopy also shows that AD was the most common skin disease pattern. No comparison was made due to the unavailability of studies found on the relationship between family history and skin disease diagnosis.

This study showed that a higher number of fungal infections (Tinea Capitis), skin allergy (atopic dermatitis), infestation (scabies), viral infection (molluscumcontagiosum and wart), and bacterial infections (impetigo and pyoderma). This is consistent with studies done in other parts of Ethiopia and Tanzania (9,20) which suggest that a hot and humid climate increases susceptibility to infectious skin diseases. Other causes may be poor sanitation and the low socio-economic status of the patients. The magnitude of scabies was 10.6% in this study which was similar to another study conducted in southern Ethiopia, Dabat, and Pokhara(7,20,23), but deviate from a study conducted in Nigeria which showed a 1.2% rate (21). Poor hygiene in winters along with poor sanitation is causes of the increased prevalence of scabies in developing countries.

LIMITATION

Finally, since it was descriptive and retrospective study we didn't included associate factors in details. So, it has been recommended to study by including such factors in detail. Additionally, being retrospective in nature we were unable to collect socio-economic aspects of the patients, which are important factors to understanding skin diseases. Therefore, the researchers again recommend for further study on those socio economic factors.

CONCLUSIONS

One skin disease patients were more than two or more skin diseases. In this retrospective study in the ALERT hospital, the most common pediatric skin diseases were fungal infections, eczema, pigmentary disorders, infestation, and bacterial infection. From this study,

skin fungal infection was the most common followed by eczema, pigmentary disorder, infestation, viral infection, urticaria, and bacterial infection. There was some seasonal variation in some diseases. There was seasonal variation in some diseases. The pattern of pediatric skin disorders represents the distribution of skin diseases in children diagnosed at the hospital.

References

1. Kingman S. Growing awareness of skin disease starts flurry of initiatives - PubMed [Internet]. [cited 2022 Mar 24]. Available from: https://pubmed.ncbi.nlm.nih.gov/16462978/
2. Karimkhani C, Dellavalle RP, Coffeng LE, Flohr C, Hay RJ, Langan SM, et al. Global Skin Disease Morbidity and Mortality: An Update From the Global Burden of Disease Study 2013. JAMA dermatology [Internet]. 2017 May 1 [cited 2022 Mar 24];153(5):406–12. Available from: https://pubmed.ncbi.nlm.nih.gov/28249066/
3. Wenk C, Itin PH. Epidemiology of pediatric dermatology and allergology in the region of Aargau, Switzerland. Pediatr Dermatol [Internet]. 2003 Nov [cited 2022 Mar 24];20(6):482–7. Available from: https://pubmed.ncbi.nlm.nih.gov/14651565/
4. Tamer E, Ilhan MN, Polat M, Lenk N, Alli N. Prevalence of skin diseases among pediatric patients in Turkey. J Dermatol [Internet]. 2008 Jul [cited 2022 Mar 24];35(7):413–8. Available from: https://pubmed.ncbi.nlm.nih.gov/18705828/
5. Dogra S, Kumar B. Epidemiology of skin diseases in school children: a study from northern India. Pediatr Dermatol [Internet]. 2003 Nov [cited 2022 Mar 24];20(6):470–3. Available from: https://pubmed.ncbi.nlm.nih.gov/14651562/
6. El-Khateeb EA. The spectrum of paediatric dermatoses in a university hospital in Cairo, Egypt. J Eur Acad Dermatol Venereol [Internet]. 2011 Jun [cited 2022 Mar 24];25(6):666–72. Available from: https://pubmed.ncbi.nlm.nih.gov/20825532/
7. Gauchan E, Kumar A, Bk G, Thapa P, Pun J. Relation of Sociodemographics and Personal Hygiene on Different Childhood Dermatoses. Kathmandu Univ Med J (KUMJ) [Internet]. 2015 Jan 1 [cited 2022 Mar 24];13(49):29–33. Available from: https://pubmed.ncbi.nlm.nih.gov/26620745/
8. WHO. Seventy-first World Health Assembly • Palais des Nations. 2018;21–6.
9. Chikoi R, Nyawale HA, Mghanga FP. Magnitude and Associated Risk Factors of Superficial Skin Fungal Infection Among Primary School Children in Southern Tanzania. Cureus [Internet]. 2018 Jul 18 [cited 2022 Mar 24];10(7). Available from: https://www.cureus.com/articles/12711-magnitude-and-associated-risk-factors-of-superficial-skin-fungal-infection-among-primary-school-children-in-southern-tanzania

10. Sarkar S, Islam A, Sen K, Ahmed A. Pattern Of Skin Diseases In Patients Attending OPD Of Dermatology Department At Faridpur Medical College Hospital, Bangladesh. Faridpur Med Coll J [Internet]. 2010 Jan 1 [cited 2022 Mar 24];5(1):14–6. Available from: https://www.banglajol.info/index.php/FMCJ/article/view/6807
11. Al-Zoman AY, Al-Asmari AK. Pattern of skin diseases at Riyadh Military Hospital, EDOJ4(2):4 [Internet]. [cited 2022 Mar 24]. Available from: http://www.edoj.org.eg/vol004/0402/004/01.htm
12. Sardana K, Mahajan S, Sarkar R, Mendiratta V, Bhushan P, Koranne R V., et al. The spectrum of skin disease among Indian children. Pediatr Dermatol [Internet]. 2009 Jan [cited 2022 Mar 24];26(1):6–13. Available from: https://pubmed.ncbi.nlm.nih.gov/19250398/
13. Hogewoning A, Amoah A, Bavinck JNB, Boakye D, Yazdanbakhsh M, Adegnika A, et al. Skin diseases among schoolchildren in Ghana, Gabon, and Rwanda. Int J Dermatol [Internet]. 2013 May [cited 2022 Mar 24];52(5):589–600. Available from: https://pubmed.ncbi.nlm.nih.gov/23557028/
14. Dos Santos JB, De Barros Guimarães P, Oliveira Cordeiro L, Paula PM, Oliveira Cordeiro L, Da Costa Carvalho S. Pediatric dermatoses at the Clinicas Hospital, Federal University of Pernambuco. An Bras Dermatol. 2004;79(3):289–94.
15. Ogunbiyi AO, Owoaje E, Ndahi A. Prevalence of skin disorders in school children in Ibadan, Nigeria. Pediatr Dermatol [Internet]. 2005 Jan [cited 2022 Mar 24];22(1):6–10. Available from: https://pubmed.ncbi.nlm.nih.gov/15660888/
16. Ramos JM, Molés-Poveda P, Tessema D, Kedir M, Safayo G, Tesfasmariam A, et al. Skin problems in children under five years old at a rural hospital in Southern Ethiopia. Asian Pac J Trop Biomed. 2016 Jul 1;6(7):625–9.
17. Marrone R, Vignally P, Rosso A, Didero D, Pizzini E, Dassoni F, et al. Epidemiology of skin disorders in Ethiopian children and adolescents: an analysis of records from the Italian Dermatological Centre, Mekelle, Tigray, Ethiopia, 2005 to 2009. Pediatr Dermatol [Internet]. 2012 Jul [cited 2022 Mar 24];29(4):442–7. Available from: https://pubmed.ncbi.nlm.nih.gov/22329635/
18. Figueroa JI, Fuller LC, Abraha A, Hay RJ. Dermatology in southwestern Ethiopia: rationale for a community approach. Int J Dermatol [Internet]. 1998 [cited 2022 Mar 24];37(10):752–8. Available from: https://pubmed.ncbi.nlm.nih.gov/9802685/
19. Shibeshi D. Pattern of skin disease at the Ethio-Swedish pediatric hospital, Addis Ababa, Ethiopia. Pediatr Dermatol [Internet]. 2000 [cited 2022 Mar 24];17(5):357–9. Available from: https://pubmed.ncbi.nlm.nih.gov/11085661

20. Kelbore AG, Owiti P, Reid AJ, Bogino EA, Wondewosen L, Dessu BK. Pattern of skin diseases in children attending a dermatology clinic in a referral hospital in Wolaita Sodo, southern Ethiopia. BMC Dermatol [Internet]. 2019 Apr 8 [cited 2022 Mar 24];19(1):1–8. Available from: https://bmcdermatol.biomedcentral.com/articles/10.1186/s12895-019-0085-5

21. Oninla OA, Oninla SO, Onayemi O, Olasode OA. Pattern of paediatric dermatoses at dermatology clinics in Ile-Ife and Ilesha, Nigeria. Paediatr Int Child Health [Internet]. 2016 Apr 2 [cited 2022 Mar 24];36(2):106–12. Available from: https://pubmed.ncbi.nlm.nih.gov/25844723/

22. Yohannes Lulu GT, JC. PREVALENCE AND ASSOCIATED FACTORS OF SKIN DISEASES AMONG PRIMARY SCHOOL CHILDREN IN ILLUABA-BORZONE, OROMIA REGIONAL STATE, SOUTH WEST ETHIOPIA. 2017 Jan 31 [cited 2022 Mar 24]; Available from: https://zenodo.org/record/1006769

23. Dagne H, Dessie A, Destaw B, Yallew WW, Gizaw Z. Prevalence and associated factors of scabies among schoolchildren in Dabat district, northwest Ethiopia, 2018. Environ Health Prev Med [Internet]. 2019 Nov 30 [cited 2022 Mar 24];24(1). Available from: https://pubmed.ncbi.nlm.nih.gov/31785612/

24. Özçelik S, Kulaç İ, Yazıcı M, Öcal E. Distribution of childhood skin diseases according to age and gender, a single institution experience. Turkish Arch Pediatr Pediatr Arşivi [Internet]. 2018 Jun 1 [cited 2022 Mar 24];53(2):105. Available from: /pmc/articles/PMC6089785/