

ORIGINAL ARTICLE

LIFESTYLE FACTORS INFLUENCING THE PREVALENCE OF SKIN DISEASES AT A PRIMARY CARE CENTER IN KARACHI

Fatima Jehangir¹, Ayla Hasan¹, Fatima Bashir¹, Noor Rahman¹
¹Department of Family Medicine, Ziauddin University, Karachi

ABSTRACT

Background: To determine the burden and assess the risk factors of skin diseases in Primary Health Care Centers in Karachi.

Methods: A total of 360 patients came to the primary health care center over the span of 6 months from May 2017 to October 2017. Out of them 151 had some sort of dermatological ailment. They were examined thoroughly for skin lesions and interviewed. Data was collected by reading out questionnaires to the patients, and filled accordingly.

Results: It was observed in our study that 151 (41.9%) patients presenting to primary care center had dermatological complaints. Mean age determined was 25 years. 87% of the study population was female while the rest were males. In our study, skin ailments were broadly divided into 3 categories out of which chronic skin conditions (43%) like lichen planus, alopecia and pityriasis alba turned out to be most common, followed by infectious skin diseases (36.4%) such as scabies, tinea and impetigo. Least recurring were allergic skin disorders (20.5%) such as atopic dermatitis. Sharing of personal items and animal contact were statistically significant variables and had strong association with skin ailments. While overcrowding, family history of similar skin condition and past personal history of same skin condition were not determined to be significantly associated with the presentation.

Conclusion: Our study shows a spectrum of skin diseases prevalent in high numbers in our population. This identifies the need for qualified family physicians with special training in dermatology to treat the masses effectively and decrease the morbidity. Detailed counseling should be offered to avoid sharing of clothes and minimizing animal contact as much as possible since skin diseases are mostly contagious. Community awareness programs should be conducted in which personal hygiene should be discussed. Scarcity of water is a social issue prevalent in this area so some policies regarding this issue should be imposed to improve the situation.

KEYWORDS: Dermatological ailments, Contagious, Prevalence, Primary care

Corresponding Author

Dr. Ayla Hasan

Department of Family Medicine,
Ziauddin University, Karachi
Email: AylaHasan96@gmail.com

INTRODUCTION

Skin diseases are on a rise since the last decade¹ and have reported to be the second leading cause of disability in Pakistan². Despite the increased

persistence of these diseases, the relative paucity of relevant data has yet to be determined³. Eczema, skin infections and acne alone account for 70.27% of the total dermatoses seen in Lahore⁴ while in Iran the frequency of these diseases is 53.4%⁵. In a study

in northern India, a point prevalence of at least one skin disease is 38.8% among children⁶. Minas et al. reported that diseases of the skin are more common among the younger generation⁷ and thus, make them more vulnerable to psychological upset. Studies suggest that females with these ailments present to primary care more often. Young girls, especially of the subcontinent region, aspire to conform to the beauty standards set by our culture and society. However, failure to comply to them leads to rejection from the society which has a negative impact on their self-worth.

Disorders of the skin can be broadly classified according to their pathogenesis into infectious, allergic or chronic diseases. Those with an infectious etiology include cellulitis, impetigo, warts, herpes simplex, scabies and head lice. These ailments can be caused by a bacterial, viral, fungal or a parasitic infection. Exposure of the skin to an allergen can elicit an immune response as in the case of urticaria and atopic dermatitis. Chronic skin conditions like Psoriasis, Rosacea and Vitiligo can last for a longer period, usually more than three months causing great inconvenience to the patients.

To curb the adverse complications associated with the aforementioned diseases, it is necessary to identify the risk factors and address them accordingly. The pattern of skin disorders differs from country to country depending on an array of cultural, geographical, financial, educational and genetic factors⁸, with contagious skin diseases being rare in developed countries. According to Global Burden of Disease Study, measles death rates were 197 times greater in developing countries than developed⁹ because patients in less developed regions are more predisposed to risk factors like overcrowding. In majority of the cases, the most effectual method of transmission is direct skin contact but indirect transmission via fomites¹⁰, overcrowding and family history are also attributable to these diseases. Our study shows that sharing of personal items and animal contact is significantly associated with the prevalence of skin diseases in primary care patients.

To date, there have not been many studies to investigate the epidemiological values¹¹ and predisposing conditions regarding skin diseases in Pakistan. Hence, our study aims to find the prevalence and risk factors of various cutaneous diseases in different age groups in primary care setting of Pakistan, in order to prevent and alleviate the symptoms as well as to shorten the course of skin related diseases.

METHODS

Total population of Sikanderabad is around 1 lac. A total of 360 patients came to primary health care center over the span of 6 months from May 2017 till

October 2017. Out of them 150 had some sort of dermatological ailment. They were examined thoroughly for skin lesions and interviewed by doctors who were trained to deal with dermatological problems. Data was collected on questionnaires given and read to the patients and informed consent was taken. Data was analyzed using SPSS version 20. Mean and standard variations were taken out for numerical data while frequencies and percentages were calculated for categorical data. Chi square test was done to see the association of risk factors with skin diseases. P- value less than 0.005 was taken as significant.

Overcrowding meant more than 2 people sharing one single room. Family members of the patients meant siblings, parents and children of the patient who had more than 3 hours of daily contact with them. Contact with animals meant either touching or handling or taking care of animals such as goats, lambs, donkeys, chicken etc. for more than 1 hour per day. Past history of the same disease meant that the subject had same diagnosis of skin ailment within the past 1 year. Family history of the disease meant that family members who shared the same house, or 1st degree family members including parents, siblings, spouses and children who had been diagnosed with the same condition as the subject participating in this study.

RESULTS

Mean age determined was 25.62 years (SD 16). Mean weight of subjects was 46.2kg (SD 20.9). Infectious skin conditions which included scabies, impetigo, folliculitis and Tineas contributed to 55 (36.4%) of cases. Allergic skin ailments such as atopic dermatitis and eczema were seen in 31 (20.5%) subjects. Chronic skin conditions such as Lichen planus, Pityriasis Alba and alopecia comprised maximum number of skin diseases which were 65 (43%) (Table 1).

It was seen that people who were fond of sharing personal items like clothing, dupattas or caps had 40.8%, 82.2% and 34% infectious, allergic and chronic skin conditions respectively with a P-value 0.003 that is statistically significant.

Participants who had animal contact had 48.3% infectious skin diseases, 21.7% allergic and 30% chronic skin ailments with P value which was determined as < 0.005, that is statistically significant. This shows strong association of animal contact with skin ailments.

It was seen that overcrowding contributed to 39.7% of infectious skin diseases, 19.8% of allergic skin diseases and 40.5% of chronic skin ailments. P-value determined was 0.168 that is not significant so overcrowding did not prove to be a risk factor in our study.

Association of family history of the same disease was tested. Infectious skin diseases were present in 34.4%, allergic in 22.1% and chronic skin diseases in 43.4%. P-value was 0.459 that is not statistically significant. So having family history of similar disease was not considerable risk factor.

Past history was present in 39.6% of infectious skin diseases, 17% of allergic skin ailments and 43.4% of chronic skin diseases. P-value was determined as 0.693 that is not statistically significant. This proved that past history was not strongly associated with having the condition.

Table 1: Socio-Demographic Factors of Study Population

Characteristics	Frequency (%)
Age, yrs(x, SD)	25.62(16)
Gender	
Male	19 (12.6)
Female	132 (87.4)
Ethnicity	
Pashtun	118(78.1)
Punjabi	11(7.3)
Urdu speaking	17 (11.3)
Sindhi	5 (3.3)
Categories of Skin Diseases	
Infectious	55 (36.4)
Allergic	31(20.5)
Chronic	65 (43)
Weight kgs(x, SD)	46.2,20.9
Sharing of clothing	103(68.2)
Animal Contact	60(39.7)
Overcrowding	126 (83.4)
Family history	122(80.8)
Past history	53(35.1)

Table 2: Association of Skin Diseases with the Characteristics

Variables	Infectious (scabies, tinea and impetigo)	Allergic (atopic dermatitis)	Chronic (lichen planus, alopecia and pityriasis alba)	p-value
	Frequency(%)	Frequency(%)	Frequency(%)	
Animal Contact				
Yes	29(48.3)	13(21.7)	18(30)	0.005
No	26(28.6)	18(19.8)	47(51.6)	
Sharing items				
Yes	42(40.8)	26(25.2)	35(34)	0.003
No	13(27.1)	5(10.4)	30(62.5)	
Gender				
Male	42.1%	31.6%	26.3%	0.235
Female	35.6%	18.9%	45.5%	
Ethnicity				
Pusthun	41(34.7%)	21(17.8%)	56(47.5%)	0.003
Punjabi	8(72.7%)	0(0%)	3(27.3%)	
Urdu Speaking	3(17.6%)	8(47.1%)	6(35.3%)	
Sindhi	60%	40%	0%	
Overcrowding				
Yes	50(39.7)	25(19.8)	51(40.5)	0.168
No	5(20)	6(24)	14(56)	
Family History				
Present	42(34.4)	26(22.1)	35(43.4)	0.459
Absent	44.8%	13.8%	41.4%	
Past History				
Yes	39.6%	17%	43.4%	0.693
No	34.7%	22.4%	42.9%	

DISCUSSION

In a study to determine the Global burden of skin diseases, it was evaluated that together all skin diseases accounted for the fourth leading cause of non-lethal burden on universal level, with fungal diseases, acne vulgaris and others adding to the ten most frequently occurring conditions¹². Even though skin diseases remain a significant health problem in many developing countries, they have not been given enough attention as they can be overcome by various public health precautions³. This study aimed to study the prevalence and burden of dermatological diseases in patients presented in a primary care clinic in PHC Sikan-drabad, Karachi. It was found that 150 patients out of the total 360 (41.7%) presented with a skin disease in a span of six months this study was conducted in, which suggested that it is a common presentation at primary healthcare setups. The risk factors that may have contributed to the development of the disease were also studied. Our research found that majority of skin ailments were Infectious diseases, Allergic reactions and Chronic skin conditions. We found that Infectious diseases like scabies, impetigo, folliculitis and tinea accounted for 36.4% of cases, allergic conditions including eczema and atopic dermatitis contributed to 20.5% of the cases while majority of the cases with the highest prevalence (43%) were chronic skin conditions comprising of Lichen planus, alopecia and pityriasis alba. In contrast to a study carried out in India, which aimed to check for skin problems in North Gujarat, most prevalent was found to be Acne or pimples (14%), followed by non specific infections (11%), alopecia (9%) and eczema (8%)¹³. According to another research, which studied the frequency of skin diseases presented to primary healthcare centre in rural Islamabad, Pakistan, it was concluded that the most frequently present cases were scabies, while dermatitis and acne vulgaris were second most common¹⁴.

In addition to studying the most prevalent diseases and the burden of diseases, we thoroughly investigated what lifestyle habits could have been a reason predisposing patients to the risk of developing a skin condition. These included age, gender, ethnicity. Other details included sharing of clothing, animal contact, overcrowding, weight, family and past history.

The mean age of our study population was found to be 25.62 years, which was similar to previous research conducted in Cameroon Africa which found highest prevalence in the 20–24 years age group¹⁵ and another study in Lahore in a tertiary care hospital which found the mean age between 20–40 years.⁴ However other contrasting data shows higher prevalence in younger children of ages 5–9 in New Zealand¹⁶, and an average age of 49.7 years in Netherlands.¹⁷ The reason for this discrepancy in

data could be attributed to the fact that dermal diseases vary in nature over the different age groups, therefore the mean age depended on the types of diseases prevalent in the population. This was displayed in a study conducted in North Carolina which ranked the top dermatologic diagnoses by age, it showed that in younger age groups, diseases such as nonspecific skin eruption, candidiasis, impetigo, abscess, and herpes simplex infection appeared in the top diagnoses. Contact dermatitis was found as the top diagnosis in the middle age group whereas in the older age groups, herpes zoster, chronic ulcer of the lower limb, and blepharitis were often present.¹⁸

With respect to gender our study showed that 87% (132/150) of the patients who presented with skin ailments were females confirming a greater occurrence of them in the female population. This was consistent with the results of an epidemiological study to find the prevalence of skin diseases conducted in Family medicine in Netherlands, which found that 60.9% of their patients who were a part of their study were females¹⁷. 12.6% of our patients were males which was very less compared to affected female population. Whereas in a study conducted in a small Brazilian town to find the prevalence of skin diseases, it was evaluated that males were 1.46 times more prone to get skin conditions than females¹⁹ which was in contrast to our findings.

When we analyzed the different ethnic groups that were included in our study, we found the highest prevalence of 78.1% was of the Pashtun community. However no other studies have proven this association before making it challenging to comment on our findings. The reason for this result could simply be due to the higher percentage of Pashtun's living in the area around the primary health care center where this study was conducted. A comparable study conducted in Al Hassa Saudi Arabia also took ethnic groups into consideration and similar to us, found that detecting and controlling ethnicity as a confounder was a difficult task.²⁰

We found that the category of skin diseases mostly affecting the population of Sikandrabad was Chronic lesions (43%), whereas Infectious and Allergic conditions were 36.4% and 20.5% respectively. In a study carried out in the villages of Nepal, curable infections and infestations came out to be the most frequently occurring skin diseases with the highest percentage of dermatophyte infections (11.4%), followed by pityriasisvesicolor (8.9%), acne (7.7%) and melasma (6.8%)²¹. We evaluated that infemales the most prevalent were chronic skin lesions (45.5%) followed by infectious (35.6%) and allergic being the least (18.9%). Out of the male patients (12.6%) however, most prevalent was infectious (42.1%) followed by allergic (31.6%) and least being chronic (26.3%). Greater exposure to the environment and occupational allergens could be

one of the reasons for males being affected more with infectious and allergic conditions. Another study to find the prevalence and type of skin diseases presented to family medicine practitioners investigated infectious diseases and inflammatory conditions to be greater in number. Topography of place was one of the major influences on the types of diseases occurring in an area.²²

When weight was studied as a factor we referred to previous data that showed body mass index (BMI) increased the presence of acne according to a similar study conducted on primary and secondary school children in turkey.²³ However a study done on school going children of tribal area in South India showed that 70.5% of the children with BMI lower than 18 had some presence of dermatological lesions.²⁴ Hence this relationship needs to be further studied in order to obtain a correlation of BMI.

In terms of personal habits we inspected the relevance of sharing of clothes. In everyday routine, beddings and clothing have the potential to act as reservoirs for the spread of disease²⁵. A strong association was found of skin diseases with sharing of clothing with a statistically significant P value of 0.003. Our results showed that 68.2% of patients with skin diseases were fond of sharing dupattas, caps, and other items. The diseases affecting these individuals were mostly Infectious (40.8%) hence indicating that sharing of equipment which was closely in contact with skin can aid the spread of infectious diseases. Second most common were found to be chronic (34%) while allergic reactions were 25.2%. Whereas in patients who did not share clothing, the most prevalent were found to be Chronic conditions (62.5%), while infectious and allergic were 27.1% and 10.4% respectively. The outcomes of sharing items as a risk factor proved to be significant in our study. This was in accordance to a study carried out in Kafr El-Sheikh administrative area of Egypt which found that the practice of sharing clothing, significantly increased the risk of scabies infection in primary school going children²⁶. In another study, which aimed to study the prevalence of Tinea Capitis in primary school going children in a rural setting in southwest Nigeria, it was concluded that sharing of items held on scalp including clips, combs, scissors, towels and fomites were the most common cause of making an individual susceptible²⁷.

It is known through previous literature that animal contact does have a significant hazard of inducing skin diseases as proven amongst the veterinarians and associated workers in Kashmir, India.²⁸ Our results show that even just frequent animal contact has a strong association with skin ailments which is also backed by the aforementioned study done in Saudi Arabia, which stated that 55.7% of urban children and 77.3% of rural children who were pet owners with regular and frequent contact reported

with dermal diseases.²⁰ A study conducted among primary school children in Illuababorzone, south west Ethiopia assessed the association to find that 50.2% of the load of dermal patients had pets at home.²⁹ Another prevalence survey of dermatological conditions in mountainous north India showed that animal cohabitation was a predictor of dermatological diseases when other risk factors were controlled. The association remained significant for atopic dermatitis but not as much for tinea.³⁰

According to our results overcrowding was not found to be a significant risk factor (P value determined was 0.168). The criteria required more than two people sharing the same room to be classified as overcrowding. According to our study, 83.4% of study population lived in overcrowded conditions but the results for prevalence of skin diseases in them did not come out to be significant. Contrary to our findings, a research carried out in Rural Africa, Tanzania, crowded conditions was one of the most important socio-economic aspects related to dermatological ailments³¹. Similarly, another study, conducted in primary school going children in Southeast Ethiopia found a high prevalence (70.7%) of skin ailments in children who shared one room with other members of the household for sleeping²⁹.

Our study showed the correlation between family history and the skin disease as insignificant, which is in contrast to the previously cited article from Al Hassa which showed there was some family history seen in cases of acne vulgaris, eczema and dandruff.²⁰

In our study population, 35.1% of the people had a past history of the same disease within the previous one year. Out of these, 39.6% had a history of infectious disease, 17% had of allergic skin reactions and 43.4% had chronic skin diseases. P-value was determined to be 0.693 which is statistically insignificant hence according to our research having a past history of dermatological conditions did not come out to be a risk factor to develop skin diseases. This is in contrast with a study held previously which stated that a history of atopic dermatitis may cause the skin to be more prone to irritants as a result of compromised skin barrier function³².

Limitations: Hygiene was a factor not taken into consideration in our study; however there is ample data from Salem; a region of our neighboring country India supporting the significant association between the prevalence of skin diseases and the factors like seldom bathing and infrequent washing of clothes.³³

CONCLUSION

The overall prevalence of skin diseases was notably high amongst the females in this community.

Although the prevalence of chronic skin diseases was the highest, the infectious variety in particular was more significantly associated with fomites and animal contact. If these lifestyle factors are kept under control, it can eminently cause a decline in skin related morbidity. Targeted public health initiatives should be considered to improve health services and quality of life by incorporating essential skin care habits in everyday lives. Additionally, community counseling campaigns aimed at enhancing awareness about various predictors of skin diseases and useful preventive measures will help create a healthy, hygienic community. It would also reduce burden on the financial resources of the patient and the government health facilities at large.

REFERENCES

1. Lee GC, Hall RG, Boyd NK, et al. A prospective observational cohort study in primary care practices to identify factors associated with treatment failure in *Staphylococcus aureus* skin and soft tissue infections. *Ann Clin Microbiol Antimicrob* 2016; 15: 58.
2. Pakistan | Institute for Health Metrics and Evaluation [Internet]. *Healthdata.org*. 2018 [cited 11 September 2018]. Available from: <http://www.healthdata.org/pakistan>
3. WHO_FCH_CAH_05.12_eng.pdf | Epidemiology | Public Health [Internet]. *Scribd*. 2018 [cited 11 September 2018]. Available from: <https://www.scribd.com/document/321244422/WHO-FCH-CAH-05-12-eng-pdf>
4. Aman S, Nadeem M, Mahmood K, Ghafoor MB. Pattern of skin diseases among patients attending a tertiary care hospital in Lahore, Pakistan. *J Taibah Univ Sci* 2017;12(5):392-6.
5. Noorbala MT, Kafaie P. Pattern of skin diseases in the Central Iran, Yazd Province. *J Pak Assoc Dermatol* 2010; 20: 137-41.
6. Dogra S, Kumar B. Epidemiology of skin diseases in school children: a study from northern India. *Pediatr Dermatol* 2003;20(6):470-3.
7. Minas M, Koukousias N, Zintzaras E, Kostikas K, Gourgoulanis KI. Prevalence of chronic diseases and morbidity in primary health care in central Greece: An epidemiological study. *BMC Health Serv Res* 2010; 10: 252.
8. Sarkar SK, Islam AKMS, Sen KG, Ahmed ARS. Pattern of Skin Diseases in Patients Attending OPD of Dermatology Department at Faridpur Medical College Hospital, Bangladesh. *Faridpur Med Coll J* 2010;5(1):14-6.
9. Boyers LN, Karimkhani C, Naghavi M, Sherwood D, Margolis DJ, Hay RJ, et al. Global mortality from conditions with skin manifestations. *J Am Acad Dermatol* 2014;71(6):1137-43.
10. Chaudhry FR, Hameed K, Naz S, Min DA, Paolotizzani, Rizvi A, et al. Scabies Prevalence and Risk Factors in Pakistan: A Hospital Based Survey. *Biomed J Sci & Tech Res* 2018; 2(2).
11. Ghirano IA, Sheikh S, Arain AA. Skin Diseases; Prevalence in Pediatric Patients in Hyderabad: Sindh, Pakistan. *Professional Med J* 2017;24(7):1031-5.
12. Hollestein L, Nijsten T. An Insight into the Global Burden of Skin Diseases. *J Invest Dermatol* 2014;134(6):1499-501.
13. Patel, NG, Patel, NJ. Epidemiological Study of Skin (Dermatological) Diseases and Its Treatment in North Gujarat. *Asian J Pharm Clin Res* 2010;3(4):40-2.
14. Bangash E, Iqbal T, Iqbal SP. Frequency of skin diseases presenting to a Primary Health Care Center in rural Islamabad, Pakistan *RMJ* 2014; 39(4): 403-5.
15. Bissek A-CZ-K, Tabah EN, Kouotou E, Sini V, Yepnjo FN, Nditanchou R, et al. The spectrum of skin diseases in a rural setting in Cameroon (sub-Saharan Africa). *BMC Dermatol* 2012;12(1):7.
16. O'Sullivan C. THE NEW ZEALAND MEDICAL JOURNAL *Journal of the New Zealand Medical Association* [Internet]. <http://www.nzma.org.nz/journal/125-1351/5106>. 2012 [cited 13 September 2018]. Available from: <http://journal.nzma.org.nz/journal/125-1351/5106/>
17. Verhoeven E, Kraaimaat F, van Weel C, van de Kerkhof P, Duller P, van der Valk P, et al. Skin Diseases in Family Medicine: Prevalence and Health Care Use. *Ann Fam Med* 2008;6(4):349-54.
18. Landis E, Davis S, Taheri A, Feldman S. Top dermatologic diagnoses by age [Internet]. *Dermatol Online J* 2018; 24 (10): <https://escholarship.org/uc/item/9gp674sw>
19. Oliveira TF, Monteguti C, Velho PE. Prevalence of skin diseases at a healthcare clinic in a small Brazilian town. *An Bras Dermatol* 2010;85(6): 947-9.
20. Amin T, Ali A, Kaliyadan F. Skin disorders among male primary school children in Al Hassa, Saudi Arabia: prevalence and socio-demographic correlates - a comparison of urban and rural populations. *Rural Remote Health* 2011; 11(1):1517.
21. Walker S, Shah M, Hubbard V, Pradhan H, Ghimire M. Skin disease is common in rural Nepal: results of a point prevalence study. *Bri J Dermatol* 2008;158(2):334-8.
22. Fien S, Berman B, Magrane B. Skin disease in a primary care practice. *Skinmed* 2005;4(6):350-3.
23. Uludağ A, Kilic SO, Isik S, Haydar Ertekin Y, Tekin M, Cevizci S, et al. Prevalence of skin disorders in primary and secondary school age children in Canakkale, Turkey: a community-based survey. *Postepy Dermatol Alergol* 2016;33(3):176-81.
24. Basti BD, Radhakrishnan S. Prevalence of dermatological manifestations among the tribal school children of South India. *Int J Community Med Public Health* 2016;3(7):1957-62.
25. Bloomfield SF, Exner M, Signorelli C, Nath KJ, Scott EA (2011). The infection risks associated with clothing and household linens in home and everyday life settings, and the role of laundry. <http://www.ifhhomehygiene.org/IntegratedCRD.nsf/eb85eb9d8-ecd365280257545005e8966/d0e3b0f361079f1780257865003d43b1>

26. Hegab DS, Kato AM, Kabbash IA, Dabish GM. Scabies among primary schoolchildren in Egypt: sociomedical environmental study in Kafr El-Sheikh administrative area. *Clin Cosmet Investig Dermatol* 2015;8:105-11.
27. Ayanlowo O, Akinkugbe A, Oladele R, Balogun M. Prevalence of Tineacapitis infection among primary school children in a rural setting in south-west Nigeria. *J Public Health Afr* 2014;5(1) :349.
28. Zeerak S, Hassan I, Rasool F, Bhat YJ, Bashir S. Pattern of Skin Diseases and Occupational Dermatoses in Veterinarians and Veterinary Workers of Kashmir. *Indian Dermatol Online J* 2017;8(6):449-53.
29. Lulu Y, Tolesa G, Cris J. Prevalence and Associated Factors of Skin Diseases among Primary School Children in Illuababorzone, Oromia Regional State, South West Ethiopia. *Indo Am J Pharma Res* 2017; 7: 7374-83.
30. Grills N, Grills C, Spelman T, Stoove M, Hellard M, El-Hayek C, et al. Prevalence survey of dermatological conditions in mountainous north India. *Int J Dermatol* 2012; 51(5):579-87.
31. Gibbs S. Skin Disease and Socioeconomic Conditions In Rural Africa: Tanzania. *Int J Dermatol* 1996;35(9):633-9.
32. Tupker R, Pinnagoda J, Coenraads P, Nater J. Susceptibility to irritants: role of barrier function, skin dryness and history of atopic dermatitis. *Brit J Dermatol* 1990;123(2):199-205.
33. Jose G, Vellaisamy S, Govindarajan N, Gopalan K. Prevalence of common dermatoses in school children of rural areas of Salem; a region of South India. *Indian J Paediat Dermatol* 2017;18(3):202-8.
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