SPECIAL REPORT

Prevalence of skin disorders and associated socio-economic factors among primary school children in the Eastern region of Saudi Arabia

Mohamudha Parveen Rahamathulla

Abstract

Objective: To identify the prevalent skin disorders among primary school children, awareness of its risk factors and to assess the socio-demographic determinants associated with their development.

Methods: The cross-sectional observational study was conducted in September-December 2016 comprising children from six public and private schools in Wadi Al Dawaser region of Eastern Saudi Arabia. A self-generated self-administered questionnaire was sent through the children to be filled up by their parents. Details on socio-demographic and skin dermatoses conditions were collected. Data were analyzed using SPSS 16.

Results: Of the 710 students approached, 499(70.2%) responded. Of them, 151(30.2%) were boys and 348(69.7%) were girls. The overall mean age was 10.3±1.4 years (range: 3-15 years). The overall prevalence of skin disorders was 118(23.6%). Allergic dermatoses 11(11.3%) and eczema 4(11.8%) were the commonest conditions. Lichen planus 6(5%), acne 9(7.6%), allergic rashes 4(3.3%), and psoriasis 3(2.5%) were also recorded. Socio-demographic and hygiene factors were significantly associated with the disease ($p<0.05$ each).

Conclusion: A high prevalence of skin disorders was encountered among primary school children in the region studied.

Keywords: Skin diseases, School children, Non-infectious, Saudi Arabia, Risk factors.

Introduction

Skin is the largest organ of the human body. It acts as a protective layer which helps to regulate the body temperature and also serves as a natural filter. The skin is affected by every aspect of human life.[1] Skin infections are ranked fourth among the top 10 most prevalent diseases and the Global Burden of Disease (GBD) study estimated that worldwide, 20-30% of the general population is affected by skin disorders such as acne, warts, scars, pigment changes etc. at least once in their lifetime.[2,3]

Skin disorders are the most common cause of morbidity among school-going children in both developed and developing countries as their skin is thin and more delicate.[4,5] Although skin diseases are rarely lethal, they can have significant impact in terms of treatment costs, days absent from school, and psychological distress.[6]

It is often stated that environmental factors such as dust, living conditions, hygiene and overcrowding usually result in various skin diseases.[7] Sometimes skin diseases offer diagnostic clues to major systemic disorders. Many skin diseases, such as acne vulgaris, psoriasis, pityriasis alba etc., can be quickly diagnosed by their clinical features and need little or no further investigations.[8]

The incidence, severity and pattern of skin diseases varies at different age groups, with different geographical locations from countries to countries and also in different parts within the same country.[9] Since the environmental condition of schools makes the source of cross-transmission of communicable skin diseases among children and their family members, surveys among school students are valuable indicators to understand the occurrence of various skin disorders, status of healthiness and hygiene of the society.[10]

In the Kingdom of Saudi Arabia (KSA), there are only a few epidemiological studies, which have measured the predominance and occurrence of skin infections among the school-going children.[7-10] And there are decidedly less detailed epidemiological studies that focus on underlying socio-demographic factors that might be responsible for the development of skin lesions.[11,12] The current study was planned to explore skin disease concerning socio-demographic factors.

Subjects and Methods

The cross-sectional observational study was conducted from September to December 2016 comprising children from six public and private schools in Wadi Al Dawaser region of Eastern Saudi Arabia. Multistage random sampling was used to raise the study sample. Data was gathered from all municipalities of the region using

Department of Medical Lab Sciences, College of Applied Medical Sciences, Prince Sattam bin Abdulaziz University, Wadi Al Dawaser-11991, Kingdom of Saudi Arabia.

Correspondence: Email: mahamudhaparveen@gmail.com

random number tables. Students who submitted more than one data set, or inaccurate data, or were unwillingness to participate were excluded. A self-generated self-reporting questionnaire was given to every participant, both in English and Arabic languages. After obtaining permission from all school principals, the questionnaires were sent to the parents or guardians through the children to be filled up.

The structured questionnaire was prepared carefully to gather data for every aspect of the study such as socio-demographic details, hygiene habits and the presence of skin dermatoses in the children. The questions were self-explanatory and straightforward for the parents or guardians to answer.

Pilot testing was carried out on the data-collection tool with 25 primary school aged children from different schools to confirm the proper administration and readability of the questionnaires devoted to the children and their guardians or parents. Concerning the hygiene factors, reliability coefficient was calculated.

SPSS 16 was used for statistical analysis. Approval was obtained from the institutional ethics committee and informed consent was obtained from each parent or guardian.

Results

Of the 710 questionnaires distributed, 499(70.2%) were received dully filled. Of them, 151(30.2%) were boys and 348(69.7%) were girls. The overall mean age was 10.3±1.4 years (range: 3-15 years). Socio-demographic characteristics of the subjects were noted (Table-1).

Of the total, 123(24.6%) children had contact with pet animals, including sheep, camel, cat, rabbit and pigeon. Overall, 51(10.2%) and 50(10%) children reported to have 'always' and 'frequent' contact with the pets respectively (Figure-1).

Of the 499 respondents, 118(23.6 %) had skin diseases. Of the infected cases, 14(11.8%) have been consulting a dermatologist for 7 years, while 12 (10.2%) had visited hospitals in the preceding 2 years, while 92(77.9%) children reported having skin problems, but had not sought any medical care. Of the 118 positive cases, the duration of the existence of the infection was analyzed. The duration of occurrence of skin diseases among the children were noted (Table-2).

During winters, 70 (59.3%) subjects reported having skin infections, while 12(10.1%) children reported no change in condition related to the weather. Also, 54(45.7%)

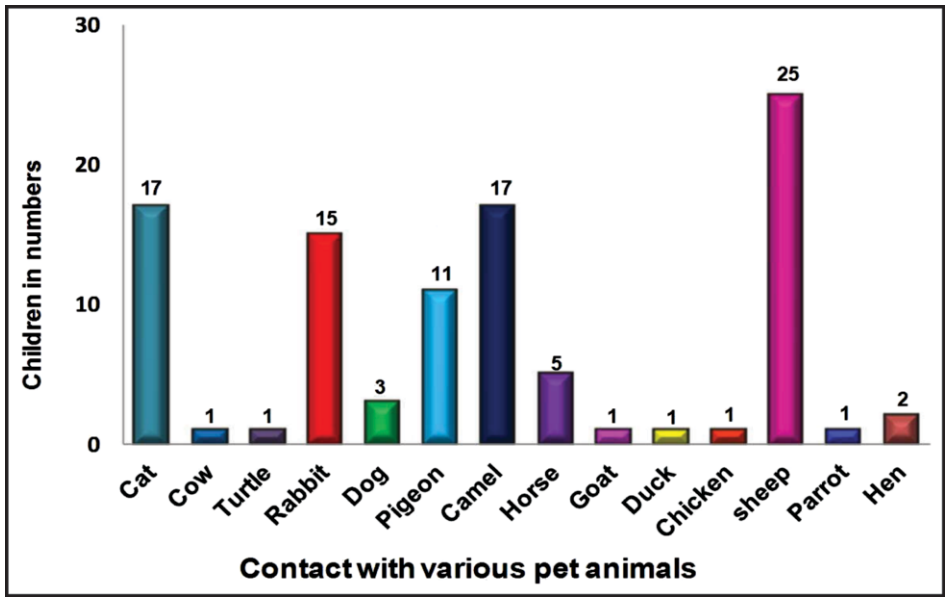

Figure-1: Distribution of the number of children contact with various pet animals.

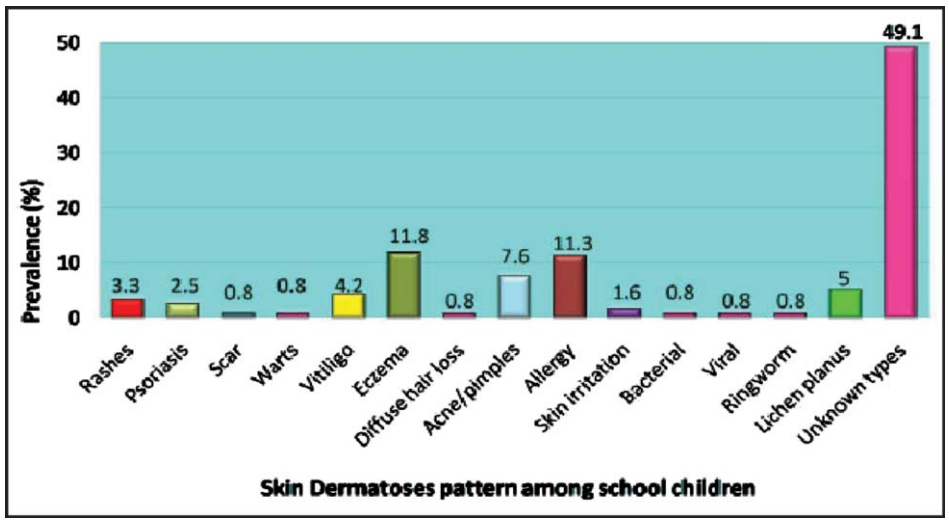

Figure-2: Different pattern of skin disorders among the infected children (n=118).

Table-1: Socio-demographics characteristics of the primary school children involved in this study (n=499).

Variable	Category	Frequency (n)	Percentage (%)
Nationality	Saudi	277	55.5
	Non-Saudi	222	44.4
Age	3-4 years	17	3.4
	5-6 years	66	13.2
	7-8 years	24	4.8
	9-10 years	178	35.6
	11-12 years	167	33.4
	13-15 years	47	9.4
Gender	Male	151	30.2
	Female	348	69.7
Type of residence	Apartment (Flats)	221	44.2
	Individual House	278	55.7
Father's level of education	School level	200	40.0
	Graduate	150	30.0
	Higher Education	149	29.8
Mother's level of education	School level	214	42.8
	Graduate	148	29.6
	Higher Education	137	27.4
Family income	<2500 riyals	168	33.6
	2500-6000 riyals	169	33.8
	?6000 riyals	162	32.4

Table-2: Distribution of the children with duration of skin problem and consulting dermatologist.

Skin Problem	Total (n=499)	Percentage (%)
Skin disease	118	23.6
No problem	381	76.4
Consulting with doctors (years, months and days)		
Years	Total (n=118)	Percentage (%)
6-7 years	3	2.5
4 years	6	5.0
3 years	5	4.2
2 years	1	0.8
1.5 years	2	1.6
1 years	2	1.6
6 months	2	1.6
4 months	1	0.8
2 months	1	0.8
1 months	2	1.6
1 week	1	0.8
Disease without consultation	92	77.9

subjects reported having reduced infection, 42(35.5%) as not reduced and 22 (18.6%) reported as un-noted when they were outside KSA.

Children who had an infection on legs were 36(30.5%), 26(22%) on the face, 18 (15.2%) on the whole body and

Table-3: Prevalence and distribution of skin disorders among the study population.

Variable	Category	Total (n=118)	Percentage (%)
Distribution of skin disorders in the children	Whole body	18	15.2
	Head	5	4.2
	Shoulder	3	2.5
	Arms	9	7.6
	Legs	36	30.5
	Neck	3	2.5
	Face	26	22.0
	Eye lids	1	0.8
	Others	17	14.4
Itching and scratching by fingers in the infected area by the children	Yes	67	56.7
	No	32	27.1
	Unknown	19	16.1
Different types of sources made the skin condition worse in the infected children	Dust	1	0.84
	Weather	1	0.84
	Certain foods	2	1.69
	Dry soaps	2	1.69
	Toilet Flush	1	0.84
	Pollen grains	1	0.84
	Unknown cause	110	93.2
Variable	Category	Total (n=499)	Percentage (%)
Prevalence of children spending time on outdoor games	Often	80	16.0
	Very often	29	5.8
	Rarely	305	61.1
	Very rarely	85	17.0
Intake of Vitamin- D supplement by the children.	Yes	49	9.81

17(14.4%) on other body parts. Children reported itching and scratching by fingers in the infected area and that made the infection worse (Table-3).

Among the 118 children with skin dermatoses, rashes were found in 4(3.3%), psoriasis in 3(2.5%), scar, diffuse hair-loss and warts in 1(0.8%) each respectively, and eczema in 14(11.8%) (Figure-2).

Of all the study subjects, 305(61.1%) reported to have rare and 85(17%) reported very rare time-spending on outdoor games.

The subjects used different types of creams and drugs for skin infections.

Discussion

This is the first study of its kind from the region and reported that socio-economic and environmental factors had a significant role in the cause and existence of this condition. The prevalence was found to be 23.6%. Eczema, acne, allergy, skin irritation and lichen planus ranked among the top five skin diseases in the region. This finding is comparative to the reports from the other parts of the Kingdom such as 27.2% from Al-Hassa and 19.23% from Jeddah regions.[11,12] These included eczematous dermatosis, allergy, infectious dermatosis, and other different infections such as pigmentary disorders and acne.

In our study, almost 49.1% of the children had skin infection, but the actual type or name was not known to their parents. Also among the infected cases, 77.9% of the children did not seek any medical treatment. This is due to the ignorance of the importance of skin hygiene and also the mentality of the common public that skin dermatoses are of minor cosmetic or non-fatal. Further, a number of cases might be existing which was not scrutinised because of no response from 211 participants.

Eczemas have been identified as common skin disease, which is also known as atopic dermatitis. In this study, 11.8% of the children were reported to have eczema or dermatitis. This is higher than a study from Madinah[13] where the point prevalence of eczemas or dermatitis was 10.3%. It was observed lower than the prevalence rate of 26.7% among female school children from Al-Khobar city.[14] In developed countries like Saudi Arabia, the increased prevalence rate of atopic dermatitis have been analysed, which has a direct influence on environmental and socio-economic factors. Such factors mainly include carpets at home, central heating or usage of room warmers and excessive hygiene. Similar environmental factors for dermatitis were reported in a study done in the United Kingdom.[15]

Further, in our study, 30.5% children had a skin infection on legs followed by 22% on the face. Extremities constitute a significant source of skin infection for the children and the infection spreads from there to the face. Nearly, 15.2% had infection throughout the body. Lichen planus is an important skin dermatosis observed in 5% reported cases. It is our perspective that Lichen planus might have been present in more number of our study population than reported. Since the parents do not know this medical terminology, they might be reported as unknown types. A total of 49.1% cases were recorded of unknown types. Lichen planus is generally atypical in appearance and thus poorly understood.

Besides, we attempted to highlight the socioeconomic correlation among the school children regarding their dermatoses. In analysing the type of residence, a maximum of 278(55.7%) children resided in individual type of houses with many siblings. Parental education, high family income, and showering frequency were observed as the negative predictors, which caused skin infection. This finding is similar to the earlier reports from Al-Hassa region of Saudi Arabia.[11] On the other end, Karim et al. recruited children from Bangladesh including 98% of the children having scabies rashes out of which 71% were re-infected in winters. Predisposing factors included poor living conditions, poorly ventilated buildings, overcrowded and congested sleeping arrangements, and poor hygiene and other inappropriate living conditions.[16]

Also in our study, 24.6% children had frequent contact with pets. In analysing the duration of the existence of the infection, 30.7% children had been infected in the preceding one year and 54(45.7%) of them had noticed that the skin dermatoses reduced when they were away from the routine place like on short-time vacations or being out of KSA. The possible cause for these changes could be due to non-contact with the source of the allergen or the infecting agent. However, only a few of them (6.7%) knew the source of the infection and nearly 93.2% were unaware of the exact or possible source of the dermatoses.

A study based on the evaluation of skin infection prevalence among male children of the primary section in Jeddah, Saudi Arabia, found there was an increasing prevalence of 12.9 % nevi, 11% head-lice, 8% pityriasis alba and 6.1% alopecia.[17] The prevalence rate was similar to the present study (2.9% each) concerning acne vulgaris and warts. A study also

demonstrated the prevalence of skin infection among female children of Al-Khobar City schools in Saudi Arabia. The findings reported pigmentary disorders as the most frequent among female school-aged children (91.6%).[14]

In our study, only two cases of bacterial and viral causes were reported. This will not bring to a conclusion that transmissible diseases are rare in Wadi Al Dawaser region, but it could be because of the self-reporting questionnaire used in the study which made it difficult for the common public with scarce knowledge about the bacterial, viral and fungal infections to report them properly. Hence, in the near future, with the aid of dermatologists, a complete screening of these positive cases is planned to be carried out to reveal the perfect scenario in the region.

From our study, it was evident that skin infections caused physical symptoms such as soreness and itchiness which has adverse effects on the quality of life. They are frequent during winter than in summer. During winter, a majority of the children 59.3% were reported to have worsened skin condition than in summer 30.5%. This could be because humidity in Saudi Arabia is very low and especially in winters the skin becomes drier for children. "Winter Itch" is a common symptom for both adults and children during winter. Low humidity, cold temperatures and the use of central heating are the external factors which tend to worsen skin conditions further during the winter season.[18]

Further, 56.7% children were reported to have itching and were scratching by fingers in the infected area. The possible reasons for these conditions could be because a child's skin is sensitive towards dryness. Heating or cooling approaches in schools and homes can affect the skin negatively. For this purpose, anti-itching creams along with lotions containing camphor, menthol, phenol, benzocaine will be helpful to get relief.

In determining the number of children spending time under the sun in outdoor games, only 5.8% were reported to be doing that very often. This is an essential concern in Wadi Al Dawaser region, where most children live in closed houses without proper exposure to sunlight. Sunlight has been identified as the most common source for vitamin D, which has a direct impact on skin disorders and fungal infections of the skin.[19] Also, 9.8% children were taking vitamin D syrup as nutritional supplement regularly. It was observed that hardly few children were exposed to sunlight daily. The recommended intake in 400IU for vitamin D regularly for infants and between 600 to 800 IU for the adults. Vitamin D is helpful for promoting better energy level, mood, memory and health status. Therefore, it is also recommended for the children to absorb sunlight for 10-15 minutes every day to get vitamin D.

There is a pivotal need to strengthen the health programmes in schools, which will be helpful for better diagnosis and examination of skin diseases. Parental educational programmes should be developed following universal guidelines, especially for mothers. In this way, the prevalence rate of skin diseases can be reduced or controlled.

Conclusion

Skin disorders were common among primary school-aged children in the study area. Eczema, acne, allergy, skin irritation and lichen planus ranked among the top five skin diseases. Of the infected children, 45.7% did not know the actual cause of the skin problem which is reflective of the ignorance of the importance of skin health.

Acknowledgement: Dr. Sughapriya, Ms. Noorah Abdullah and Ms. Sarah for their help in data collection.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Rea JN, Newhouse ML, Halil T. Skin disease in Lambeth: a community study of prevalence and use of medical care. Br J Prev Soc Med. 1976; 30:107-14.
2. Burton JL, Savin JA, Champion RH. Introduction, epidemiology and historical bibliography. In: Champion RH, Burton JL, Ebling FJ, eds. Textbook of dermatology 5th ed. Oxford: Blackwell Scientific Publications, 1992; pp-163-9.
3. Dold S, Wjst M, von Mutius E, Reitmeir P, Stiepel E. Genetic risk for asthma, allergic rhinitis and atopic dermatitis. Arch Dis Child. 1992; 67:1018-22.
4. Clore ER, Longyear LA. Comprehensive pediculosis screening programs for elementary schools. J Sch Health. 1990; 60: 212-4.
5. Rao GS, Kumar SS, Sandhya. Pattern of skin diseases in an Indian village. Indian J Med Sci. 2003; 57:108-10.
6. Al-Saeed WY, Al-Dawood KM, BukhariIA, Bahnassy A. Dermatoses in obese female school children in the Al-khobar area, eastern Saudi Arabia. J Family Community Med. 2006; 13: 65-69.
7. Agarwal PK. Pattern of skin diseases in the Al-Jouf region. Ann Saudi Med. 1997; 17: 112-4.
8. Mostafa AA, Hassan AH, Bahamdan K. Skin disorders among male schoolchildren in the Asir Region, Southwestern Saudi Arabia. Ann Saudi Med. 1996; 16:342-5.
9. Al-Khawajah MM, Al-Shammari S, Al-Mofadhi A, Al-Eisa A, Al-Kudwah A, Al-Saleh S. Spectrum of dermatological disorders in school children in Saudi Arabia, part 1; national guard school in Riyadh. J Saudi Soc Dermatol Venereol. 1997; 5: 214-221.

10. Samer KZ, Muhammad QA, Fathi EM, Muhammad KN. Prevalence of skin disorders among male primary school children in the city of Jeddah, Saudi Arabia. Saudi Med J. 1996; 17: 56-61.
11. Amin TT, 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; 11:1517.
12. Zimmo SK, Qari MA, El-Gamal F, Mkordy MN. Prevalence of skin disorders among male primary school children in the City of Jeddah, Saudi Arabia. Saudi Med J. 1996; 17: 56-61.
13. Nahhas M, Bhopal R, Anandan C, Elton R, Sheikh A. Prevalence of allergic disorders among primary school-aged children in Madinah, Saudi Arabia: Two-Stage Cross-Sectional Survey. PLoS One. 2012; 7: e36848.
14. Al-Saeed WY, Al-Dawood KM, Bukhari IA, Bahnassy AA. Prevalence and pattern of skin disorders among female schoolchildren in Eastern Saudi Arabia. Saudi Med J. 2006; 27: 227-34.
15. Flohr C, Weinmayr G, Weiland SK, Addo-Yobo E, Annesi-Maesano I, Bjorksten B, et al. ISAAC Phase Two Study Group. How well do questionnaires perform compared with physical examination in detecting flexural eczema? Findings from the International Study of Asthma and Allergies in Childhood (ISAAC) Phase Two. Br J Dermatol. 2009; 161:846-53.
16. Karim SA, Anwar KS, Khan MA, Mollah MA, Nahar N, Rahman HE, et al. Socio-demographic characteristics of children infested with scabies in densely populated communities of residential madrashas (Islamic education institutes) in Dhaka, Bangladesh. Public Health. 2007; 121:923-34.
17. Zimmo SK, Qari MA, El-Gamal F, Mkordy MN. Prevalence of skin disorders among male primary school children in the City of Jeddah, Saudi Arabia. Sau Med J. 1996; 17: 56-61.
18. Williams HC. Epidemiology of skin diseases. In: Champion RH, Burton JL, Ebling FJ, eds. Textbook of dermatology 5th ed. Oxford: Blackwell Scientific Publications, 1992; pp-139-58.
19. Marcus JF. 10 healing benefits of the sun [Online] 2014 [Cited 2017 January 12]. Available from URL: http://www.mindbodygreen.com.