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Research Article

Skin Disease Pattern

# Pattern of Skin Diseases in Al Baha Region of Saudi Arabia

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**Abstract:** With regard to dermatological diseases, knowledge of the prevalence of diseases would provide the dermatologist with sufficient background information to make an accurate diagnosis.The objective of the study is to determine the prevalence of dermatological diseases in Al-Baha region, and compare this to that reported in other regions of Saudi Arabia. The study included all new cases of skin diseases that were seen at the dermatology outpatient clinic in King Fahad Hospital, Al Baha, from January 1, 2014 to December 31, 2016. Data were collected from the patients' medical records, and the diagnosis was made by either a dermatology consultant or specialist according to the International Classification of Diseases (ICD-10). A total of 3153 patients were included in this study, and the dermatological diseases were categorized into ten groups. Eczema had the highest prevalence (24.33%), followed by acne (17.36%), viral infections (11.1%), pigmentary disorders (7.04%), papulosquamous diseases (5.7%), fungal infections (5.28%), alopecia and urticaria (equally prevalent, 5.18%), and parasitic infection (1.37%). The remaining 619 patients (19.6%) had a dermatological diagnosis that fell into the 'miscellaneous' category. The results of this study were comparable to those of similar studies performed in other regions in Saudi Arabia. Eczema was the most frequent dermatological disease in Al-Baha.

**Keywords:** Eczema, Dermatological, Al-Baha, Acne, Prevalent. Pigmentary Diseases and Papulosquamous Diseases.

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## 1. INTRODUCTION

Determining the prevalence of any disease is an essential part of healthcare planning. The prevalence of diseases depends on various factors, including genetic, familial, environmental, and nutritional factors[1]. With regard to dermatological diseases, knowledge of the prevalence of diseases would provide the dermatologist with sufficient background information to make an accurate diagnosis [2]. However, it is challenging to determine community-based prevalence as most of the available data are from single-center studies [3]. In this study, we aimed to determine the prevalence of skin diseases in Al-Baha, and compare it with the prevalence reported in other regions in Saudi Arabia, with the intention of providing dermatologists with a better insight in terms of understanding the pattern of dermatological diseases. Our objective is to determine the prevalence of dermatological diseases in Al-Baha, and compare to that reported in other regions of Saudi Arabia.

## 2. METHODOLOGY

The data used for this study were collected. All patients who attended the dermatology outpatient clinic in King Fahad hospital in Al-Baha from January 1, 2014 to December 31, 2016 were included. A total of 3153 patients were included and stratified according to their diagnosis. Diagnosis was made by consultants and specialist Dermatologists, and based on clinical presentation, laboratory results, and histopathological findings wherever possible. The stratification was based according to the International Classification of Disease (ICD-10).

### *2.1 Data Collection*

The data for every patient who attended the dermatology out-patient clinic were included and collected by the primary investigator. The dermatological diagnosis of each patient was recorded in an out sheet, which was later transferred to excel and SPSS (version 25.0.0.0).

### *2.2 Population Selection Criteria*

- All age groups (13 years old was the cut-off point for pediatrics and adults)
- All nationals (Saudis and non-Saudis)
- Both sexes (male and female)
- Established diagnosis made by a dermatology consultant according to the International Classification of Disease (ICD-10)

### *2.3 Data Entry and Statistical Analysis*

Data were collected by hand and checked by investigator; no missing data were reported. Coding of the data was carried out by the investigator and performed for all the variables. Statistical analysis was performed using SPSS. This project was a cross sectional analysis, in which the main outcome, dermatological disease, was a categorical variable. The objective of this report is to determine the pattern of dermatological diseases in Al-Baha, and compare it to other local areas in the Kingdom of Saudi Arabia.
The frequency of each dermatological diagnosis was recorded, and additional descriptive analysis was performed in order to show the frequency according to further sub-classifications (Table 2). According the nationality, age and gender.

### *2.4 Ethical Consideration*

The study was approved by the ethics committee in King Fahad Hospital in Al-Baha.

## 3. RESULTS

**Table 1. The frequency of dermatological diseases in King Fahad Hospital in Al-Baha.**

| Disease group | Nationality (Saudi/non-Saudi) | Age Children/Adult < 13Y/> 13Y | Gender Male/Female | Total | Total % |
|---|---|---|---|---|---|
| ***Eczemas*** | 672/75 | 208/539 | 341/406 | 747 | 24.33 |
| ***Urticaria*** | 148/13 | 17/142 | 56/103 | 159 | 5.18 |
| ***Acne*** | 509/24 | 8/525 | 140/393 | 533 | 17.36 |
| ***Pigmentary disorders*** | 200/16 | 25/191 | 89/127 | 216 | 7.04 |
| ***Viral infections*** | 302/39 | 66/257 | 208/133 | 341 | 11.1 |
| ***Alopecia*** | 148/11 | 16/143 | 43/116 | 159 | 5.18 |
| ***Fungal infections*** | 147/15 | 22/140 | 84/78 | 162 | 5.28 |
| ***Parasitic diseases*** | 34/8 | 17/25 | 29/13 | 42 | 1.37 |
| ***Papulosquamous diseases*** | 157/18 | 41/134 | 102/73 | 175 | 5.7 |
| ***Miscellaneous**** | 480/139 | 131/488 | 282/337 | 619 | 19.6 |

A total of 3153 patients were included in this study, over a 24 month period, from January 1, 2014 to December 31, 2016. The dermatological diseases were subcategorized into eczema, urticaria, acne, pigmentary disorders, viral infections, alopecia, fungal infections, parasitic diseases, papulosquamous diseases, and miscellaneous (Table 1). Eczema was the commonest dermatological disease, representing 24.33% of the total dermatological diseases; this was followed by acne (17.36%), viral infections (11.1%), pigmentary diseases (7.04%), papulosquamous diseases (5.7%), and fungal infections (5.28%). Both alopecia and urticaria had a percentage with 5.18%. Parasitic infections comprised 1.37% of the total dermatological diseases, and 19.6% of the diagnoses fell under miscellaneous dermatological diseases. In total, 672 of the eczema patients were Saudis and 75 patients were non-Saudis. In addition, 2018 of the patients were younger than 13 years old and 539 were older than 13 years old. In terms of sex, 341 of the eczema patients were male and 406 were female. Urticaria comprised 5.18% of the total dermatological diseases, of which 148 were Saudis and 13 were non-Saudis are 13. With regards to the age of urticaria patients, 17 patients were younger than 13 years old and 142 patients were

older than 13 years old; of which, the majority were female (103 females and 56 males). With regards to the acne patients, 509 were Saudis and only 24 were non-Saudis; of which, 8 patients were younger than 13 years old and 525 were older than 13 years old. In terms of sex, 393 of the acne patients were female and only 140 were male. Pigmentary disorders were found in 200 of the Saudi patients and in only 16 of the non-Saudi patients. Adults had more pigmentary disorders in comparison to children, and females had more than males. A total of 341 patients had viral infections; of which, 302 were Saudis and 39 were non-Saudis. The majority of patients were older than 13 years old (257 patients) and 66 were younger than 13 years old, and 2018 were male, with only 133 are female patients. On the contrary, alopecia was a more common problem in females, with a total number of 116 females and only 43 males. Males and females had similar prevalence of fungal infections, with 84 and 78 patients, respectively; only 12 of these patients were non-Saudis, while 147 were Saudis. Furthermore, only 22 patients were under the age of 13 years old and 140 patients were older than 13 years. Parasitic diseases only affected 42 patients; of these, 8 were non-Saudis and the remaining were Saudis. The male to female ratio was 1:2, and there was a similar number of pediatric and adult patients (17 and 25, respectively). Papulosquamous diseases affected a total of 175 patients; of which, 157 patients were Saudis and 18 were non-Saudis. The pediatrics to adult patient ratio was 1:3, with 41 patients under 13 years old and 134 patients older than 13 years. Other dermatological diseases were counted under miscellaneous, with total number of 619 patients; of which, 480 were Saudis and 282 were males.

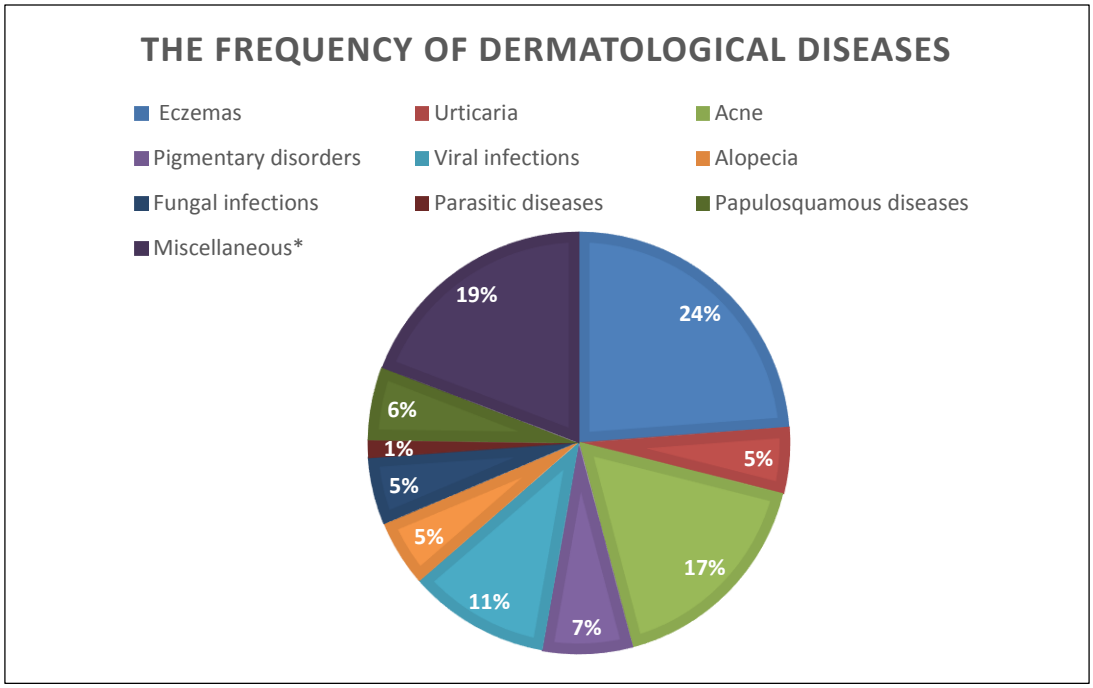


**Fig 1: The frequency of dermatological diseases**

**Table 2. A breakdown of the main categories of dermatological diseases.**

| Disease group | Nationality (Saudi/Non-Saudi) | Age Children/Adult < 13Y/> 13Y | Gender Male/Female | Total (n) | Total (%) |
|---|---|---|---|---|---|
| ***Eczema*** | | | | | |
| Atopic dermatitis | 345/35 | 126/254 | 176/204 | 380 | 12.38 |
| Contact dermatitis | 57/7 | 16/48 | 25/39 | 64 | 2.08 |
| Seborrheic dermatitis | 40/5 | 9/36 | 22/23 | 45 | 1.47 |
| Others | 230/28 | 57/201 | 118/140 | 258 | 8.40 |
| Total | 672/75 | 208/539 | 341/406 | 747 | 24.33 |
| ***Urticaria*** | 148/13 | 17/142 | 56/103 | 159 | 5.18 |
| *Acne* | 509/24 | 8/525 | 140/393 | 533 | 17.36 |
| ***Pigmentary Disorders*** | | | | | |
| Vitiligo | 82/7 | 16/73 | 43/46 | 89 | 2.90 |
| Melasma | 34/4 | 0/38 | 3/35 | 38 | 1.24 |
| Post-inflammatory hyperpigmentation | 70/2 | 4/68 | 36/36 | 72 | 2.35 |
| Post-inflammatory hypopigmentation | 14/3 | 5/12 | 7/10 | 17 | 0.6 |
| Total | 200/16 | 25/191 | 89/127 | 216 | 7.04 |
| ***Viral Infections*** | | | | | |
| Viral warts (verruca vulgaris) | 204/26 | 62/168 | 141/89 | 230 | 7.49 |
| Chicken pox (varicella) | 43/7 | 2/48 | 31/19 | 50 | 1.63 |
| Herpes zoster | 34/6 | 1/39 | 26/14 | 40 | 1.3 |

| | | | | | |
|---|---|---|---|---|---|
| Molluscum contagiosum | 21/0 | 19/2 | 10/11 | 21 | 0.68 |
| Total | 302/39 | 66/257 | 208/133 | 341 | 11.1 |
| ***Alopecia*** | 148/11 | 16/143 | 43/116 | 159 | 5.18 |
| ***Fungal Infections*** | | | | | |
| Dermatophytes | 78/10 | 16/72 | 52/36 | 88 | 2.87 |
| Pityriasis versicolor | 64/5 | 3/66 | 28/41 | 69 | 2.25 |
| Candidiasis | 5/0 | 3/2 | 4/1 | 5 | 0.16 |
| Total | 147/15 | 22/140 | 84/78 | 162 | 5.28 |
| ***Parasitic Diseases*** | | | | | |
| Cutaneous leishmaniasis | 18/4 | 11/11 | 16/6 | 22 | 0.72 |
| Scabies | 16/4 | 6/14 | 13/7 | 20 | 0.65 |
| Total | 34/8 | 17/25 | 29/13 | 42 | 1.37 |
| ***Papulosquamous Diseases*** | | | | | |
| Psoriasis | 93/6 | 20/79 | 61/38 | 99 | 3.22 |
| Pityriasis rosea | 31/4 | 19/16 | 21/14 | 35 | 1.14 |
| Pityriasis rubra pilaris | 3/0 | 1/2 | 2/1 | 3 | 0.1 |
| Lichen planus | 30/8 | 1/37 | 18/20 | 38 | 1.24 |
| Total | 157/18 | 41/134 | 102/73 | 175 | 5.7 |
| ***Miscellaneous**** | 480/139 | 131/488 | 282/337 | 619 | 19.6 |

Eczema is subcategorized into atopic dermatitis, contact dermatitis, seborrheic dermatitis, and other. Atopic dermatitis was the most common skin disease, with a total of 380 patients, while seborrheic dermatitis was the least common, with only 45 patients. All types of eczema affected females more than males, and were more common in adults than pediatrics. Both urticaria and acne had no subgroups, and affected 5.1% and 17.3% of the patients, respectively. Pigmentary disorders were subcategorized to four main subgroups as follows: Vitiligo, melasma, post-inflammatory hyperpigmentation, and post-inflammatory hypopigmentation. Of the patients with pigmentary disorders, the most common was vitiligo, with the majority of vitiligo patients being Saudis (82 compared to 7 non-Saudis). Post inflammatory hyperpigmentation had the second highest percentage, followed by melanoma then post-inflammatory hypopigmentation. Viral infections were classified into viral warts, chicken pox, herpes zoster, and molluscum contagiosum, with frequencies of (7.49%), (1.63%), (1.3%), and (0.63%), respectively. Viral warts were the highest among Saudis, with a ratio of 8:1, more common in adults than pediatrics (3:1), and more common in males than females (1.5:1). Surprisingly, chicken pox was found to be more common in the adult age group (48) than the pediatric age group (2). Herpes zoster had similar results, and was found to be more common in adults (39) than pediatrics (1). Molluscum contagiosum was not found in non-Saudis, but was found in 19 pediatric patients and 2 adults. Both males and females were almost equally affected with 10 and 11 cases, respectively.

Alopecia was not categorized into subgroups in this study, and it was found that alopecia in general affected 148 Saudis compared to 11 non-Saudis. Furthermore, out of a total of 159 patients, alopecia was found in 16 pediatric patients, while females comprised 116 of the total 159 patients. Fungal infection was sub grouped into dermatophytes, pityriasis versicolor, and candidiasis. Dermatophytes patients comprised 88 of the total fungal patients, 78 of which were Saudis, 72 were adults, and 52 were male. Pityriasis versicolor had a total of 69 patients, the majority of which were female (41), adults (66), and Saudis (64). Candidiasis was only found in 5 patients, all of whom were Saudis, 3 were pediatrics, and 4 were male. Parasitic diseases (42) were sub grouped into cutaneous leishmaniasis (22) and scabies (20). Both of these diseases affected more Saudis than non-Saudis, more males than females, and more adults than pediatrics. Papulosquamous diseases were sub grouped into psoriasis, pityriasis rosea, pityriasis rubra pilaris, and lichen planus. In total, 175 diseases were classified as papulosquamous diseases; of which, psoriasis was the highest (99). Of the psoriasis patients, 93 were Saudis, 79 were adults and the male to female ratio was 2:1. Pityriasis rosea was diagnosed in 35 patients, with pediatrics and adults are similarly affected (19 and 16, respectively). Pityriasis rubra pilaris had the lowest prevalence, with a total of 3 patients, while lichen planes affected only 1 pediatric patient out of the total 38. Other dermatological diseases were counted under miscellaneous, with a total of 619 patients; of which, 480 were Saudis and 282 were males.

**Table 3. Comparison of the frequency of common skin diseases in this study and other studies of different regions in Saudi Arabia.**

| Dermatoses | Asir % | Al Baha % | Hail % | Najran % | Eastern Province % |
|---|---|---|---|---|---|
| Dermatitis/eczema | 25.7 | 24.3 | 16.3 | 37 | 19.6 |
| Atopic dermatitis | 13.8 | 12.38 | 8.25 | 18.5 | 7 |
| Acne | 5.5 | 17.36 | 12.4 | 12.8 | 13.8 |
| Viral warts | 2.5 | 7.49 | 8.4 | 6 | 11.9 |
| Superficial mycoses | 6.2 | 5.28 | 6.2 | 5.6 | 9.6 |
| Vitiligo | 3 | 2.9 | 3.9 | 7 | 5 |
| Psoriasis | 2.1 | 3.22 | 3.6 | 1.5 | 3.4 |
| Lichen planus | 1.3 | 1.24 | 1.2 | 1.1 | 1.7 |

Dermatitis/eczema was found to be the highest in Najran (37%), while Asir and Al Baha had a similar frequency (25.7% and 24.3%, respectively) and Hail had the lowest frequency (16.3%). Atopic dermatitis had the highest frequency in Najran (18.5%), followed by Asir (13.8%), and Al Baha (12.38%). Hail and the Eastern Province had a similar frequency of 8.25% and 7%, respectively. The prevalence of acne was highest in Al Baha (17.36%), while the Eastern Province, Najran, and Hail had similar frequencies (13.8%, 12.8%, and 12.4%, respectively); the lowest frequency of acne was recorded in Asia (5.5%). Viral warts had the highest prevalence in the Eastern Province with 11.9%, followed by 8.4% in Hail, 7.49% in Al Baha, 6% in Najran, and 2.5% in Asir. Superficial mycoses was the highest in the Eastern Province (9.6%), followed by a similar frequency of (6.2%) in Hail and Asir; the lowest frequency was in Al Baha (5.28%). Vitiligo was the highest in Najran with 7% of patients, followed by 5% in the Eastern Province, 3.9% in Hail, 3% in Asir, and 2.9% in Al Baha. Psoriasis had similar frequencies between regions, with the highest being in Hail (3.6%) and the lowest in Najran (1.5%). Lichen planus also had similar frequencies between the regions; the highest was in the Eastern Province (1.7%) and the lowest was in Najran (1.1%).

## 4. DISCUSSION

To the best of our knowledge, this is the first report to describe skin disease pattern in Al-Baha, Saudi Arabia. The data used in this study was collected from the records of King Fahad hospital, which is a tertiary hospital in Al-Bahaand receives referral from primary care centers in the region; therefore, we believe that the findings of this study represent a rough estimate of Al-Baha region skin diseases prevalence. In this study, Saudis represented 88.7% of the patients and Non-Saudis represented 11.3%. This can because this hospital treats only Saudi nationals and non-Saudis who work in the governmental sectors. The majority of the patients are females (56.42%); this is possibly because, in general, women are more concerned about their appearance and their skin than men [9]. The result of this study was compared with those of other studies pertaining to different local areas in Saudi Arabia (Table 4). We found that eczema is the most common skin disease, as confirmed by this study as well as other regional studies [3,4]. Al-Baha had almost similar result to Asir (24.3% versus 25.7%, respectively). Atopic dermatitis is the most common eczema and this finding was consistent with those of other studies done on other regions [3,4]. The consanguineous marriages in the tribal based society of Saudi Arabia genetically predispose the people in this region to allergic diseases such as atopic dermatitis. However, the mode of inheritance is yet to be determined and environmental factors are also expected to have an important role in this high prevalence of atopic dermatitis [3]. Acne was the second most common condition; the same was reported by a study conducted in the Eastern province [3]. This may be explained by the fact that acne manifest mainly on the face, and the patients are often more concerned about their facial appearance and are, therefore, likely to seek medical help for acne, even at early stages. Acne can be affected by stress, menstrual cycle, and seasonal variations [12]. Moreover, it is believed that acne can be aggravated by excessive consumption of chocolate, fatty food, fried food, and spices [13]. Viral warts came next, as reported in the eastern province and with a greater prevalence than that reported in Asir [3]. This is probably because of the similar weather conditions in Al-Baha and the Eastern province, which are hot and humid in summer. Heat and humidity are associated with higher incidence of viral warts [14, 15]. In general, viral, bacterial, and fungal infections are more frequently reported in developing countries [16]. The incidence of psoriasis and vitiligo was found to be (3.22%) and (2.9%), respectively, in our study; a relatively similar prevalence has been reported in other regions of Saudi Arabia. Psoriasis and vitiligo are believed to be among the most devastating dermatological diagnoses as they can last for several years, often lifelong, and affect the patient's quality of life. Vitiligo per se comes with a social stigma, which affect their life quality [9]. In conclusion, the results of this study were largely consistent with those of several similar studies that investigated skin diseases in other regions of Saudi Arabia.

## 5. LIMITATIONS

It is worth mentioning that although this study results can be a good estimate of the prevalence of dermatological diseases in Al-Baha, it is not entirely inclusive and might be an underestimation of the actual prevalence because we believe that several cases such as sexually transmitted diseases (STDs) go unreported as the patients tend to go to private clinic for privacy.

## 6. CONCLUSION

The pattern of skin diseases in Al Baha region is similar to that reported in other regions of Saudi Arabia. Eczema is the most commonly reported skin disease in our study. Dermatological educational programs for primary healthcare physicians should be conducted to assess easy and fast diagnosis of dermatological diseases at early stages

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## 8. AUTHORS CONTRIBUTIONS

All authors contributed equally to the manuscript and research.

## 9. CONFLICT OF INTEREST

Conflict of interest declared none.

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