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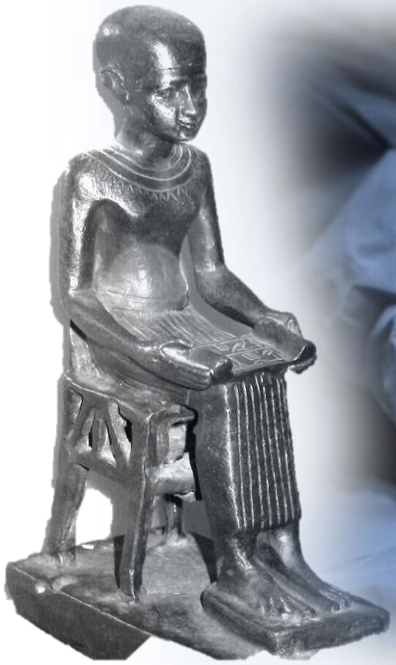

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Clinicoepidemiological Study of Psoriasis Among Preparatory School Students in Damietta Governorate

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Abstract

Background: Psoriasis is a chronic immune-mediated disease that significantly affects the skin, nails, and joints, with both genetic and environmental factors contributing to its pathogenesis. In children and adolescents, psoriasis can severely impact quality of life, self-esteem, and social relationships. The prevalence of psoriasis varies widely globally, with different rates reported in various regions.

Aim of the work: This study aimed to describe the clinico-epidemiological aspects of psoriasis among preparatory school students in Damietta Governorate, Egypt.

Patients and methods: A cross-sectional study was conducted on 4162 preparatory school-aged children in Damietta from October 2023 to May 2024. The sample was proportionally clustered, and data were collected through structured questionnaires and clinical examinations. The inclusion criteria were children aged 10 to 18 years, both male and female, residing in Damietta. The primary outcome measured was the prevalence of psoriasis, while secondary outcomes included demographic characteristics, disease characteristics, and associated comorbidities.

Results: The study included 4162 children, with a mean age of 14 ± 0.87 years. The prevalence of psoriasis was 0.1%, with 6 cases identified. Among the psoriatic cases, 66.6% were male and 33.3% were female, with an equal distribution between urban and rural residencies. The most common dermatological diseases observed were dandruff [10.9%], pityriasis alba [7.2%], and acne [6.1%]. A significant correlation was found between dermatological diseases and residency, with urban areas having a higher prevalence of dandruff and acne.

Conclusion: The study provides valuable insights into the prevalence and characteristics of psoriasis among preparatory school students in Damietta. The findings highlight the need for targeted interventions and awareness programs to manage and mitigate the impact of psoriasis in this population.

Keywords: Psoriasis; Prevalence; Clinical; Epidemiology; Preparatory School; Pediatrics.

INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory skin disorder characterized by well-defined erythematous plaques covered with silvery scales. It is a multifactorial disease influenced by genetic predisposition, environmental triggers, and immune system dysregulation [1].

Psoriasis affects approximately 2-3% of the global population, with significant variations in prevalence across different geographic regions, ethnicities, and age groups [2].

The disease is associated with substantial physical, psychological, and social burdens, often leading to reduced quality of life and increased healthcare costs [3].

Despite advances in understanding its pathogenesis and treatment, psoriasis remains a challenging condition to manage, particularly in resource-limited settings.

The onset of psoriasis can occur at any age, but it is commonly categorized into two types based on age of onset: type I [early-onset] and type II [late-onset]. Early-onset psoriasis, which begins before the age of 40, is more prevalent and is often associated with a stronger genetic predisposition, particularly with the presence of the HLA-Cw6 allele [4]. This form of psoriasis tends to have a more severe and recurrent course, with a higher likelihood of familial aggregation [5].

In contrast, late-onset psoriasis, which begins after the age of 40, is often milder and less frequently associated with a family history of the disease [6].

Adolescents represent a unique and vulnerable population in dermatological research. This age group is characterized by rapid physical, emotional, and social development, making them particularly susceptible to the psychological and social impacts of chronic skin diseases like psoriasis. Studies have shown that adolescents with psoriasis often experience significant psychological distress, including anxiety, depression, and low self-esteem, which can negatively affect their academic performance, social interactions, and overall well-being[7].

Furthermore, the visible nature of psoriasis lesions can lead to stigmatization and social isolation, exacerbating the emotional burden on affected individuals [8].

Despite the global prevalence of psoriasis, epidemiological data on its occurrence among adolescents, particularly in low- and middle-income countries, remain scarce. In Egypt, psoriasis is a common dermatological condition, but few studies have focused on its prevalence and clinical characteristics among school-aged children and adolescents. Existing studies have primarily examined adult populations or have been conducted in urban areas, leaving a gap in knowledge about the burden of psoriasis in rural and underserved regions such as Damietta Governorate [9].

This gap in data underscores the need for population-based studies to better understand the epidemiology of psoriasis in this demographic.

The preparatory school years [typically ages 12-15 in Egypt] represent a critical period for health interventions, when lifelong habits and attitudes toward health are formed. Early diagnosis and management of psoriasis during this stage can significantly improve outcomes and reduce the long-term impact of the disease. However, limited awareness of psoriasis among students, parents, and even healthcare providers often leads to delayed diagnosis and inadequate treatment [10].

Furthermore, the lack of specialized dermatological services in rural areas like Damietta Governorate exacerbates the challenges faced by affected individuals.

AIM OF THE WORK

This study aims to describe the Clinico-epidemiological aspects of psoriasis among preparatory school students in Damietta governorate.

PATIENTS AND METHODS

This cross-sectional study was conducted among preparatory school students in Damietta Governorate, Egypt, from October 2023 to May 2024. The study aimed to determine the prevalence, clinical characteristics, and associated risk factors of psoriasis in this population. A total of 4,162 students aged 10–18 years were included.

Inclusion Criteria:

- Age 10–16 years.
- Residents of Damietta Governorate.

Exclusion Criteria:

- Non-residents of Damietta Governorate.
- Students or parents who declined participation.

Sampling Technique:

A cluster sampling method was employed, proportionate to the size of the target population. The sampling process involved three stages:

1. Proportional allocation of samples across preparatory stages [grades].
2. Random selection of schools based on geographic distribution.
3. Random selection of classrooms within schools, with all students in selected classes included.

The sample size was calculated using StataDirect version 3 based on a population size of 137,223, a 95% confidence level, a 1% margin of error, and an expected psoriasis prevalence of 0.19% [12]. The calculated sample size was 300, but the study was expanded to 4,162 students to ensure robust data.

Data Collection:

Data were collected using a structured questionnaire and clinical examination.

1. **Questionnaire:**
    - Demographic details: age, sex, residence.
    - Risk factors: smoking, trauma, sun exposure, physical activity.

- Comorbidities and family history of psoriasis or autoimmune diseases.

2. **Clinical Examination:**
   - Conducted in well-lit school settings.
   - Students with suspected psoriasis were assessed for:
     - Skin phototype [Fitzpatrick scale].
     - Lesion morphology, distribution, and body surface area [BSA] affected.
     - Disease severity using the Psoriasis Area and Severity Index [PASI].
   - Additional data: age of onset, disease course, duration, and treatment history.

Outcome Measures

Primary Outcome:

Prevalence of psoriasis.

Secondary Outcomes:

Demographic characteristics: age, sex, comorbidities, smoking status.

Disease characteristics: Onset, course, duration, aggravating factors, associated diseases, lesion distribution, and severity.

Ethical Considerations:

The study was approved by the Ethical Committee of the Faculty of Medicine, Al-Azhar University [Damietta]. Permissions were obtained from the Directorate of Education, Damietta Governorate, and school directors. Written informed consent was obtained from parents, and student assent was secured. The study adhered to the Declaration of Helsinki [1975].

Statistical Analysis:

Data were analyzed using SPSS version 26 [IBM, USA]. Normality was assessed using the Kolmogorov-Smirnov test. Qualitative data were expressed as numbers [%] and compared using the Chi-square or Fisher's exact test. Quantitative data were expressed as mean ± SD and compared using the independent t-test. A p-value < 0.05 was considered significant.

RESULTS

A total of 4,162 children were included in the study. The demographic characteristics of the participants, including age, gender, residency, and smoking status, are summarized in Table 1.

The prevalence and types of dermatological diseases among the studied participants are presented in Table 2. Out of 4,162 children, 41.6% had no dermatological conditions. The most common dermatological diseases were dandruff [10.9%], pityriasis alba [7.2%], acne [6.2%], dandruff with acne [5.1%], urticaria [4.0%], and eczema [3.9%].

The prevalence of psoriasis was 0.14% [6 cases], indicating that psoriasis is relatively rare in this population but still represents a significant dermatological concern due to its chronic nature and potential impact on quality of life. Other less common conditions included vitiligo [0.7%], herpes simplex [0.7%], and alopecia areata [0.99%]. Rare conditions such as mycosis fungoides and plc were observed in 0.02% of participants. A statistically significant correlation was found between residency and dermatological diseases [**p = 0.001**]. Psoriasis was equally distributed, representing **0.1%** of both urban and rural participants [Tables 3 and 4].

Among the 6 psoriatic cases, the majority were male [**66.6%**], and half resided in urban areas. Passive smoking was prevalent [**66.6%**], primarily attributed to fathers [Table 5].

Psoriatic cases exhibited a progressive course [**83.3%**], with **50%** reporting psychic stress as a trigger. Family history of psoriasis was present in **83.3%** of cases. Topical treatments, including emollients, were universally prescribed [Table 6].

Table [1]: Demographic Characteristics of the Studied Participants

Variable	Details	Measures
Age [Years]	Mean ± SD	14 ± 0.87
	Range	13–15
Gender	Male	2086 [50.1%]
	Female	2076 [49.9%]
Residency	Urban	2382 [57.2%]
	Rural	1780 [42.8%]
Smoking Status	Non-smoker	2906 [69.8%]
	Active smoker	41 [1%]
	Passive smoker	1215 [29.2%]
Who is smoker?	Child	41 [1%]
	Father	1184 [28.4%]
	Brother	31 [0.7%]

Table [2]: Prevalence and Types of Dermatological Diseases Among Participants

Dermatological Disease	N	Percentage [%]
None	1731	41.59
Dandruff	452	10.86
Pityriasis Alba	299	7.18
Acne	260	6.24
Dandruff + Acne	213	5.12
Urticaria	168	4.04
Eczema	162	3.89
Dandruff + Pityriasis Alba + Acne	90	2.16
Dandruff + Pityriasis Alba	80	1.92
Pediculosis	70	1.68
Tinea Versicolor [T.V.]	64	1.54
Dandruff + Eczema	58	1.39
Wart	49	1.18
Acne + Urticaria	45	1.08
Alopecia Areata	41	0.99
Pityriasis Alba + Acne	34	0.82
Vitiligo	29	0.70
Herpes Simplex	28	0.67
Dandruff + Vitiligo	26	0.62
Dandruff + Wart	26	0.62
Dandruff + Urticaria	26	0.62
Tinea Capitis	26	0.62
Dandruff + Pediculosis	23	0.55
Dandruff + Tinea Versicolor [T.V.]	23	0.55
Impetigo	19	0.46
Freckles	18	0.43
Pityriasis Alba + Eczema	17	0.41
Pityriasis Alba + Wart	15	0.36
Pityriasis Alba + Urticaria	14	0.34
Dandruff + Freckles	12	0.29
Dandruff + Impetigo	10	0.24
Dandruff + Herpes Simplex	10	0.24
Psoriasis	6	0.14
Acne + Pediculosis	6	0.14
Neurofibromatosis	1	0.02
Ichthyosis	4	0.10
Acne + Vitiligo	3	0.07
Actinic Lichen	2	0.05
Mycosis Fungoides	1	0.02
Plc	1	0.02
Total	4162	100.00

Table [3]: Comparison of Urban and Rural Participants by Demographics

Variable		Urban [N=2,382]	Rural [N=1,780]	P value
Age [Years]	Mean ± SD	13.5 ± 0.81	14 ± 0.82	0.02*
	Range	13–15	13–15	
Gender	Male	1206[50.6%]	880 [49.4%]	0.4
	Female	1176[49.4%]	900 [50.6%]	
Smoking Status	Non-smoker	1665[69.5%]	1250[70.2%]	0.61
	Active smoker	21 [0.9%]	20 [1.1%]	
	Passive smoker	705 [29.6%]	510 [29.2%]	
Who is smoker?	Child	21 [0.9%]	20 [1.1%]	0.001*
	Father	684 [28.7%]	500 [28.1%]	
	Brother	21 [0.9%]	10 [0.6%]	

Table [4]: Correlation Between Dermatological Diseases and Residency

Dermatological Disease	Urban [N=2,382]	Rural [N=1,780]	P value
None	936 [39.3%]	793 [44.7%]	0.001*
Dandruff + Acne	66 [2.8%]	147 [8.3%]	
Dandruff + Pediculosis	3 [0.1%]	20 [1.1%]	
Dandruff + Eczema	18 [0.8%]	40 [2.2%]	
Dandruff + Vitiligo	7 [0.3%]	19 [1.1%]	
Dandruff + Wart	7 [0.3%]	19 [1.1%]	
Dandruff + Urticaria	16 [0.7%]	10 [0.6%]	
Dandruff + Freckles	12 [0.5%]	87 [4.9%]	
Dandruff + P. Alpa + Acne	3 [0.1%]	10 [0.6%]	
Dandruff + Impetigo	1 [0.01%]	10 [0.6%]	
Dandruff +Herpes Simplex	2 [0.1%]	22 [1.2%]	
Dandruff + T.V.	395[16.6%]	78 [4.4%]	
Dandruff + P. Alpa	225 [9.4%]	57 [3.2%]	
Dandruff	6 [0.3%]	74 [4.2%]	
P. Alpa	6 [0.3%]	39 [2.2%]	
Acne + Urticaria	22 [0.9%]	19 [1.1%]	
Acne + Pediculosis	3 [0.1%]	39 [2.2%]	
Alopecia Areata	31 [1.3%]	3 [0.2%]	
Acne + Vitiligo	3 [0.1%]	27 [1.5%]	
Pediculosis	7 [0.3%]	9 [0.5%]	
Neurofibromatosis	8 [0.3%]	9 [0.5%]	
P. Alpa + Acne	6 [0.3%]	9 [0.5%]	
P. Alpa + Eczema	5 [0.2%]	20 [1.1%]	
P. Alpa + Wart	44 [1.8%]	10 [0.6%]	
P. Alpa + Urticaria	18 [0.8%]	10 [0.6%]	
T.V.	9 [0.4%]	58 [3.3%]	
Herpes Simplex	110 [4.6%]	19 [1.1%]	
Impetigo	236 [9.9%]	59 [3.3%]	
Urticaria	103 [4.3%]	20 [1.1%]	
Acne	9 [0.4%]	10 [0.6%]	
Eczema	39 [1.6%]	9 [0.5%]	
Vitiligo	6 [0.3%]	20 [1.1%]	
Wart	9 [0.4%]	1 [0.1%]	
Psoriasis	3 [0.1%]	3 [0.1%]	
Freckles	3 [0.1%]	1 [0.1%]	
Tinea Capitis	2 [0.1%]	795[44.7%]	
Mycosis Fungoides	66 [2.8%]	147 [8.3%]	
Plc	3 [0.1%]	20 [1.1%]	
Ichthyosis	18 [0.8%]	40 [2.2%]	
Actinic Lichen	7 [0.3%]	19 [1.1%]	

Table [5]: Demographic Characteristics of Psoriatic Cases

Variable		N [%] or Mean ± SD
Age [Years]		13.1 [13–14]
Gender [Male]		4 [66.6%]
Residency [Urban]		3 [50%]
Smoking Status	Non-smoker	1 [16.6%]
	Active smoker	1 [16.6%]
	Passive smoker	4 [66.6%]
Who is smoker?	Student	1 [16.6%]
	Father	4 [66.6%]

Table [6]: Clinical Characteristics of Psoriatic Cases

Variable		N [%] or Mean ± SD
	Incidence	6 [0.14%]
Onset	Acute	1 [16.6%]
	Gradual	4 [66.6%]
	Insidious	1 [16.6%]
Course	Progressive	5 [83.3%]
	Remission and exacerbation	1 [16.6%]
Relation to Psychic Stress	Yes	3 [50%]
	No	3 [50%]
Duration of Disease [Years]		2 [0.8–5.5]
Drugs Aggravating Disease	No	2 [33.3%]
	NSAID	3 [50%]
	Not noticed	1 [16.6%]
Associated Diseases	No	4 [66.6%]
	Arthritis	1 [16.6%]
	Upper respiratory tract infection	1 [16.6%]
Family History of Psoriasis	No	1 [16.6%]
	Yes	5 [83.3%]
First Lesion Appearance	Right index	1 [16.6%]
	Palm	2 [33.3%]
	Trunk	2 [33.3%]
	Elbow	1 [16.6%]
Precipitating Factors	NSAID	3 [50%]
	Stress	2 [33.3%]
	Absent	1 [16.6%]
	Upper respiratory tract infection	1 [16.6%]
	Sun exposure	1 [16.6%]
Itching	Yes	3 [50%]
	No	3 [50%]
Previous Treatment	Methotrexate	1 [16.6%]
	Acitretin	2 [33.3%]
	No	1 [16.6%]
	Topical [Steroid, Vitamin D, Emollient]	2 [33.3%]
Duration of Previous Treatment [Weeks]		4.1 ± 1.1 [3–6]
Distribution of Lesion	10 Nails of hands and plaques over the body	1 [16.6%]
	Both hands and feet	1 [16.6%]
	Trunk and extremities	3 [50%]
	Elbow, knee, and thigh	1 [16.6%]
Clinical Variant	Nail psoriasis + Plaque psoriasis	1 [16.6%]
	Palmoplantar	1 [16.6%]
	Vulgaris	2 [33.3%]
	Guttate	2 [33.3%]
Severity of Psoriasis	Mild	3 [50%]
	Moderate	1 [16.6%]
	Severe	2 [33.3%]

DISCUSSION

Psoriasis is a chronic, immune-mediated disease that predominantly affects the skin but can also have systemic manifestations. Understanding its prevalence and distribution, particularly among children, is critical for developing targeted public health interventions and optimizing treatment strategies [13].

This cross-sectional study, conducted among preparatory school-aged children in Damietta, Egypt, provides valuable insights into the epidemiology of psoriasis in this specific population, alongside other dermatological conditions. The findings are compared with recent studies to highlight similarities, differences, and potential influencing factors. The study included 4,162 participants aged 13–15 years, with a mean age of 14 ± 0.87 years. Adolescence is a critical period marked by significant hormonal changes, which are known to influence the onset or exacerbation of conditions like psoriasis [14].

The age distribution in this study aligns with global research targeting similar age groups, reflecting the relevance of this demographic for understanding early-onset psoriasis [15].

The gender distribution was nearly equal, with 50.1% males and 49.9% females. Previous studies have suggested that psoriasis may manifest differently between genders, with males often experiencing more severe symptoms and females showing a higher prevalence of certain types, such as guttate psoriasis [16]. However, the equal distribution observed in this study suggests that gender did not significantly influence psoriasis prevalence, consistent with broader epidemiological data [17].

Residency played a pivotal role in understanding environmental and socio-economic factors influencing health outcomes. Urban participants comprised 57.2% of the cohort, while 42.8% resided in rural areas. Urbanization is often associated with higher rates of chronic conditions like psoriasis, potentially due to factors such as pollution, lifestyle stressors, and varying healthcare access [18].

Interestingly, psoriasis prevalence did not differ significantly between urban and rural areas, suggesting a complex interplay of genetic and environmental factors [19].

Smoking status revealed that 69.8% of participants were non-smokers, 1% were active smokers, and 29.2% were passive smokers, primarily exposed to tobacco smoke from fathers [28.4%]. Smoking, both active and passive, is a well-established risk factor for psoriasis [20].

The high rate of passive smoking among children underscores the need for public health interventions to reduce tobacco exposure, particularly given its association with psoriasis exacerbation [21].

Among participants, 41.6% had no dermatological conditions, while psoriasis was identified in 0.14% of the cohort. Other common conditions included dandruff [10.9%], pityriasis alba [7.2%], and acne [6.1%]. The low prevalence of psoriasis aligns with global findings, suggesting it is less common in pediatric populations, likely due to regional genetic and environmental factors [22].

Significant differences were observed between urban and rural participants regarding dermatological conditions. For example, dandruff combined with acne was more prevalent in rural areas, while tinea versicolor and pityriasis alba were more common in urban settings. These disparities likely reflect differences in environmental exposures, hygiene practices, and healthcare access [23].

Despite these differences, psoriasis prevalence remained consistently low across both areas, suggesting that genetic predisposition and lifestyle factors may play more critical roles [18].

Among the six psoriatic cases identified, most were male, and a significant portion had a family history of psoriasis, consistent with the well-documented genetic component of the disease [24]. The clinical presentation, including lesion severity and distribution, mirrored findings from other studies, which suggest pediatric psoriasis often presents with milder symptoms than in adults [16].

The high rate of passive smoking among psoriatic patients [66.6%] further strengthens the link between tobacco exposure and psoriasis, emphasizing the importance of reducing environmental risk factors [20].

While this study's results align with existing literature, some discrepancies were noted. For instance, **El-Khateeb *et al.*** [25] reported a higher prevalence of psoriasis among children in Cairo compared to Damietta, potentially due to environmental factors such as higher pollution levels or differences in healthcare accessibility.

Additionally, **Paller *et al.*** [16] highlighted a strong association between obesity and psoriasis in the United States, a factor not explored in this study. The absence of such an association in our findings may reflect differences in dietary habits and physical activity levels among Egyptian children, suggesting that certain risk factors for psoriasis may be context-specific and require tailored public health strategies.

Study Strengths and Limitations:

This study has several strengths, including a large sample size of 4,162 participants, which provides robust epidemiological data on psoriasis and other dermatological conditions. The balanced gender representation ensured an unbiased analysis, while the inclusion of both urban and rural populations allowed for meaningful comparisons. However, the study also has limitations. Its cross-sectional design limits the ability to establish causal relationships. Additionally, mild or asymptomatic psoriasis cases may have been underreported, potentially affecting prevalence estimates. The study also lacked data on obesity and dietary habits, which are known risk factors for psoriasis, suggesting areas for future research.

Conclusion:

This study highlights a low prevalence of psoriasis [0.14%] among preparatory school-aged children in Damietta, Egypt, with no significant urban-rural differences. Key risk factors included family history and passive smoking. The findings underscore the importance of genetic predisposition and environmental influences, such as tobacco exposure, in pediatric psoriasis. Public health interventions targeting smoking reduction and early diagnosis are essential to mitigate the disease's impact in this population. Further research is needed to explore regional variations and additional risk factors.

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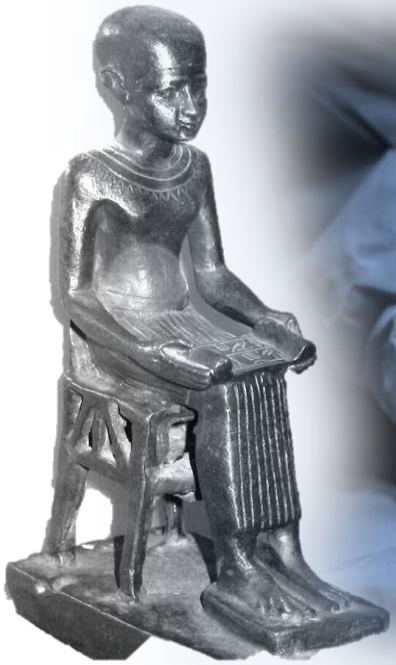

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