Original Article

Clinicodemographic and Healthcare Resource Utilization Profile of Pediatric Psoriasis Patients in a Tertiary Public Hospital in Southern Philippines: A 4-year Retrospective Study

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Abstract

Background: Psoriasis is a chronic, inflammatory disorder of the skin, nails, and joints that develop in genetically predisposed individuals. Despite the low prevalence of pediatric psoriasis, it is not an uncommon condition since one-third of adults with psoriasis had its onset during childhood. At present, published literature on pediatric psoriasis in the Philippines is lacking.

Objectives: This study aimed to determine the clinicodemographic and healthcare resource utilization profiles of pediatric psoriasis patients.

Materials and Methods: This is a 4-year retrospective study conducted at a tertiary public hospital in the Philippines utilizing chart review of patients aged 18 years and below, diagnosed with psoriasis.

Results: The average age is 10.68 years while the mean age at diagnosis is 10.35 years. There is female predilection. For the initial psoriasis area and severity index (PASI) scores, 5.26% had mild, 8.77% had moderate, and 33.33% had severe PASI. Majority of the lesions at initial diagnosis were observed on the trunk, followed by extremities and then scalp. Only 5 out of 57 patients were noted to have been triggered by an infection. Eight out of 57 patients had a positive family history. The most common nail finding is onycholysis, followed by pitting and then oil spots and subungual hyperkeratosis. For the comorbidities, 17.5% have atopy-associated conditions. Majority of the patients were given topical anti-inflammatory treatments; 12% were prescribed systemic treatment while only 5.26% utilized phototherapy. The average cost of hospitalization is PHP 17,967.17.

Conclusion: Most of the data gathered and presented in the study are in agreement with published studies on pediatric psoriasis among Asian populations.

Keywords: Clinicodemographic profile, healthcare resource utilization, pediatric psoriasis

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Introduction

Psoriasis is a chronic, inflammatory disorder of the skin, nails, and joints that develop in genetically predisposed individuals both in adults and children. It is associated with multiple comorbidities, mainly cardiovascular, leading to significant morbidity and a decreased quality of life. Due to

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its chronic nature, the economic burden of psoriasis weighs heavily on the patients and their families. A study by Zabala *et al.* in 2022 revealed that the cost of treatment for psoriasis for 6 months ranges from PHP 31,002.52 to PHP 128,221. Diagnostic expenses amounting to PHP 7,737.61 also add to the financial concerns of these patients.[1]

The worldwide prevalence of psoriasis in adults ranges from 0.51% to 11.43% and in children, up to 1.37%.[2] In 2020, the Global Psoriasis Atlas, a collaboration among three leading international organizations in dermatology, published country-specific prevalence data. The estimated total prevalence in the Philippines is 0.3% with approximately 320,000 Filipinos being affected. The adult prevalence is estimated to be 0.38% and in children, 0.04%.[3] According to the Philippine Dermatological Society-Health Information System, there were a total of 30,131 cases of new and old psoriasis patients seen from 2011 to 2021, 12% or 3623 cases of which were aged 18 years and below.[4]

Studies on pediatric psoriasis in the country are limited. Lucero and Frez described the demographic and clinical profile of childhood psoriasis at the Philippine General Hospital from 2004 to 2009.[5] The 6-year retrospective study revealed a female preponderance in childhood psoriasis with a male-to-female ratio of 1:2. The mean age of onset was found to be earlier in males at 7 years, compared to females at 12 years of age. The most frequent subtype seen was chronic plaque type, followed by guttate, erythrodermic, and pustular psoriasis. A more recent study by Bunagan and Cauilan reported the prevalence and clinical profile of childhood psoriasis at the Southern Philippines Medical Center from 2011 to 2015.[6] They conducted a 4-year retrospective study that involved 26 cases. Similar to the previous study, there were more females affected than males, and the mean age of the patients was 11 years. Plaque-type psoriasis was also the most commonly encountered subtype. Nail involvement was seen in 29% while joint involvement was present in only 11.9% of cases. Topical therapy using corticosteroids and Vitamin D3 analogs was the treatment of choice in majority of the cases. This study further contributes by identifying the most common subtype at presentation, the proportion of patients with comorbidities, and the healthcare resource utilization (HCRU) profile of patients. A recent study by Edson-Heredia *et al.* identified HCRU in pediatric psoriasis using a US claims database. They found that all-cause HRCU and costs were proportional to the severity of psoriasis as expected. Compared to mild psoriasis, the all-cause healthcare utilization was almost twice, and costs were almost four to five times in moderate-to-severe pediatric psoriasis.[7]

For the objectives of this study, it aimed to determine the clinicodemographic and HCRU profiles of pediatric patients diagnosed with psoriasis at a tertiary public hospital from January 2016 to December 2019. Specifically, the study aimed to (1) describe the demographic profile in terms of current age, age at initial diagnosis of psoriasis, sex, and nationality; (2) describe the clinical profile in terms of diagnosis at initial presentation, psoriasis area and severity index (PASI) score, body surface area (BSA) involvement and lesion location at initial consult, lesion location throughout the disease, triggering factors, presence of family history, nail and joint involvement, associated clinical symptoms, comorbidities, treatments received, and body mass index (BMI); (3) describe the morbidity of pediatric psoriasis in terms of incidence and prevalence, and (4) describe the HCRU profile of the patients in terms of number of dermatology outpatient department (OPD) consults, number of OPD consults in other departments, number of laboratory examinations/workup done, number of psoriasis treatments, number of hospital admissions, and cost of hospitalization and PhilHealth (PHIC) coverage.

By reporting additional clinical features of pediatric psoriasis patients not included in previous studies and their healthcare resource utilization, this study provides a clearer picture on the state of this chronic inflammatory condition among Filipinos and may be used as a reference for clinicians, researchers, and policymakers alike as they strive to include psoriasis in the list of conditions with PHIC coverage.

Materials and Methods

This was a retrospective, descriptive study conducted at the department of dermatology of a tertiary public hospital in the Philippines, approved by the Hospital Research Ethics Committee. Included in this study were patients aged 18 years and below who were diagnosed with psoriasis either at the dermatology OPD or from inpatient referrals between January 2016 and December 2019. The study utilized a purposive, nonprobability sampling wherein all patients satisfying the inclusion criteria were included (total enumeration). This yielded 57 patients which satisfied the calculated optimum sample size ($n = 51$, using pwr.p. test function). The diagnosis was based on the final diagnosis written on the front sheet of the patient's chart for inpatient referrals and on the diagnosis written by the physician on the outpatient charts. Case report forms were used in data collection, and numeric codes were assigned to each patient to ensure confidentiality. Three sources of data were used for this study: (1) patient's hospital charts were used for clinical and demographic data, (2) hospital Health

Information System was used for diagnostic and other laboratory tests for the healthcare utilization data, and (3) statement of account from the billing section was used for the total hospital cost and PHIC coverage. The HCRU profile was patterned after the study of Zabala *et al.*[1] This included outpatient and emergency room consults, hospital admissions, laboratory and diagnostic procedures, and treatment medications prescribed. In addition, the methodology for the total hospitalization cost was patterned after the study of Crisostomo *et al.*[8] Descriptive statistics was utilized to summarize the clinicodemographic and HCRU data of the patients. Categorical data were presented as frequencies and percentages. Missing variables from charts were not estimated and were recorded as "not indicated" in the case report forms.

Results

A total of 57 pediatric patients with psoriasis, 52 outpatients and 5 inpatients, were analyzed in the study.

Table 1 summarizes the basic demographic profile of pediatric patients with psoriasis from 2016 to 2019. The average age of the patients is 10.68 years (standard deviation [SD] = 6.1 years), and the mean age of patients at diagnosis was 10.35 years (SD = 6.06 years). Around 2 out of 3 patients (64.9%) are females.

Table 2 presents the clinical profile of patients upon initial consultation wherein 73.68% were diagnosed with psoriasis vulgaris, and infantile psoriasis was seen in 5.26%. Other psoriatic diagnoses included guttate psoriasis, juvenile generalized pustular psoriasis, scalp psoriasis, and exfoliative dermatitis secondary to psoriasis. Other conditions which included exfoliative dermatitis secondary to other conditions, atopic dermatitis, and pityriasis rosea were seen in 4 out of the total 57 patients. For the initial PASI scores, 5.29% were classified as mild, 8.77% were moderate, and 33.33% were classified as severe, while the majority (53.63%) did not have a stated PASI score.

Table 1: Demographic profile of pediatric psoriasis patients

	Statistic, count (%)
Age of child, mean±SD	10.68±6.10
Infants	10 (17.54)
Early childhood	2 (3.51)
Middle childhood	16 (28.07)
Adolescents	29 (50.88)
Age at diagnosis, mean±SD	10.35±6.06
Sex	
Female	37 (64.91)
Male	20 (35.09)
Nationality Filipino	57 (100)

SD: Standard deviation

Table 2: Clinical profile of pediatric psoriasis patients

	n (%)
Initial diagnosis	
Psoriasis vulgaris	42 (73.68)
Infantile psoriasis	3 (5.26)
Guttate psoriasis	2 (3.51)
Juvenile-generalized pustular psoriasis	2 (3.51)
Scalp psoriasis	2 (3.51)
Exfoliative dermatitis	
Secondary to psoriasis	2 (3.51)
Secondary to other conditions	2 (3.51)
Others (nonpsoriasis related)	2 (3.51)
Initial PASI	
Mild	3 (5.26)
Moderate	5 (8.77)
Severe	19 (33.33)
Not indicated	30 (52.63)
Lesion location	
At diagnosis	
Trunk	41 (71.93)
Extremities	34 (59.65)
Scalp	32 (56.14)
Face	12 (21.05)
Inguinal	10 (17.54)
Neck	7 (12.28)
Throughout the disease	
Trunk	36 (63.16)
Scalp	26 (45.61)
Extremities	25 (43.86)
Face	8 (29.63)
Inguinal	6 (10.53)
Neck	2 (7.41)
Triggering factor	
Infection	5 (8.77)
Not indicated	52 (91.23)
Family history of psoriasis	
Yes	8 (14.04)
No	10 (17.54)
Not indicated	39 (68.42)
Nail involvement	
Onycholysis	4 (7.02)
Pitting	3 (5.26)
Oil spots	2 (3.51)
Subungual hyperkeratosis	2 (3.51)
Others	2 (3.51)
None	4 (7.02)
Not indicated	44 (77.19)
Joint involvement	
Arthralgia (location unspecified)	4 (7.02)
Knee	1 (1.75)
None	6 (10.53)
Not indicated	47 (82.46)
Associated symptoms	
Pruritus	34 (59.65)
Not indicated	23 (40.35)
Comorbidities	
Atopy-associated	10 (17.54)
None	31 (54.39)
Not indicated	17 (29.82)
BMI, mean±SD	15.25±0.92
Medications	
Topical anti-inflammatory	51 (89.47)
Emollients	43 (75.44)
Antihistamines	34 (59.65)
Systemic anti-inflammatory	7 (12.28)
Tar shampoo	5 (8.77)
Topical antibiotics	4 (7.02)
Phototherapy	3 (5.26)
Topical antifungal	2 (3.51)
Combination	1 (1.75)
Others	3 (5.26)

BMI: Body mass index, SD: Standard deviation, PASI: Psoriasis area and severity index

For the location of lesions during initial consultation, about 70% had lesions on the trunk, followed by 60% on the extremities. Throughout the disease, the majority (63.16%) still had lesions on the trunk, but this was now followed by 45.61% having lesions on the scalp.

Triggering factors for psoriasis were not indicated for the majority of patients. Only 5 out of 57 patients with psoriasis were noted to have been triggered by an infection. Regarding the presence of family history of psoriasis, 8 had a positive family history and 10 had none, while the rest did not have this variable indicated in the records.

For associated nail lesions, the most common was onycholysis (7.02%), followed by pitting (5.26%) and then oil spots and subungual hyperkeratosis (both at 3.51%). For the joint involvement, 7.02% had arthralgia but with the location unspecified. About 6 out of 10 patients experience pruritus due to the condition. For the comorbidities, 17.5% have atopy-associated conditions while more than half of them (54%) have no reported comorbidities. Majority of the patient records did not indicate BMI, but among those with indicated weight and height values for children above the age of 2 years, the mean BMI was 15.25 kg/m^2.

Finally, with regard to the medications prescribed, 90% of patients were given topical anti-inflammatory treatments, 75% were prescribed emollients, and about 60% of patients were given antihistamines. Only about 12% were prescribed systemic treatment while only 5.26% utilized phototherapy. Other treatment options include tar shampoo, topical antibiotics, topical antifungal, and combination treatments.

For the yearly incidence of pediatric psoriasis in this institution, it was calculated from the number of new cases per year divided by the total number of patients seen that year in the OPD and dermatology ward. The yearly pediatric psoriasis Incidence in the institution is as follows: 0.12% (2016), 0.09% (2017), 0.09% (2018), and 0.10% (2019). For the prevalence from 2016 to 2019 which was 0.24%, it was computed from the total number of old and new cases divided by the total number of patients seen that year in the OPD and dermatology ward for the 4-year period.

Table 3a states HCRU classified according to severity. For the number of OPD consultations, more moderate–severe psoriasis patients had at least one consult. However, it is noteworthy to point out that there are more moderate–severe patients who had zero OPD consultations. For the number of hospital admissions, as expected, more moderate–severe patients with psoriasis were hospitalized.

For the number of psoriasis treatments, majority of the moderate–severe patients were prescribed with three different treatment modalities. For the number of laboratory examinations, more patients within the mild severity group had <5 tests done. For those who had five or more laboratory tests done, there were 10 in the moderate–severe patient group as compared to only one in the mild severity group.

Based on Table 3b, the average cost of hospitalization for pediatric patients with psoriasis is PHP 17,967.17.

Discussion

This retrospective study revealed that there is a female preponderance among Filipino pediatric psoriasis patients which is consistent with studies done in Singapore, India, China, Taiwan, and South Korea.[9-14]

The median age of onset is 10.5 years which is in agreement with the study of Yen *et al.*, Kumar *et al.*, and Garg *et al.*[9,15,16] Kwon *et al.* reported a peak age of onset at 10–11 years,[14] while Chandran *et al.* and Choon *et al.* reported a lower mean age of onset at 7.7 years[10] and 7.9 years,[17] respectively.

Congruous to published studies, plaque-type psoriasis was the most common type seen in children with psoriasis.[9,13,16,17] This was followed by guttate, pustular,

Table 3a: Healthcare resource utilization profile of pediatric psoriasis patients

Healthcare utilization	Patients with mild PASI (*n*)	Patients with moderate-severe PASI (*n*)
Number of OPD consultations		
0	0	5
1	1	8
2	2	5
More than 2	1	4
Number of hospital admissions		
0	4	16
1	0	4
2	0	2
Number of psoriasis treatments		
2	1	7
3	1	13
4	1	4
Number of laboratory examinations/workup		
<5	3	12
5–10	0	2
11–14	1	4
15 and above	0	4

PASI: Psoriasis area and severity index, OPD: Outpatient department

Table 3b: Cost of hospitalization of pediatric psoriasis patients

	Mean±SD	Minimum	Maximum
Cost of hospitalization	17,967.17±8298.82	8056.00	32,511.50

SD: Standard deviation

and scalp psoriasis subtypes. In addition, it is worthy to note that four patients had nonpsoriatic conditions as their initial diagnoses. These included atopic dermatitis, pityriasis rosea, and exfoliative dermatitis secondary to seborrheic dermatitis. This reflects the fact that psoriasis may be misdiagnosed as other types of eczema, especially in the initial period of the condition.

For the PASI, majority had a severe score consistent with Kwon *et al.*[14] Unlike other studies wherein the first presentation was noted to be on the scalp[10,13] or on the extremities,[11,12,16] Filipino pediatric psoriasis patients commonly had initial lesions on the trunk which is similar to the finding in a study from South Korea.[14]

Infection was the most often identified triggering factor similar to Wu *et al.*[13] However, this is not the case with studies from India[12,15] wherein trauma is the most commonly reported precipitating factor.

Family history was reported in only about 14% of patients, similar to the 17% reported by Chandran *et al.*[10] This is higher compared to reported data (5%–8%) from India and China.[11,13,15]

Based on previous studies,[10,13,16] nail involvement is seen in 8%–38% of patients with nail pitting as the most common manifestation. However, in the present study, onycholysis was seen more frequently than pitting.

Joint involvement was present in 3.5% of patients at a tertiary center in India.[16] Other studies report that 3.6% and 4.3% of patients have arthralgia and arthritis, respectively.[13,17] In this study, arthralgia was seen in 7.02% (4) of patients.

Pruritus was seen in 59.6% (34) of patients which is consistent with other studies wherein majority of the patients also presented with pruritus.[12,13]

Only atopy-associated comorbidities were identified in this study at 17.54%.[10] The study of Wu *et al.* identified allergic contact dermatitis as the most frequent comorbidity at 22.6%, followed by eczema at only 4.3%.[13]

Standard height and weight measurement was not routinely stated in the records; thus, only two patients aged more than 2 years had data on BMI. Both were males and both were within the normal percentiles for BMI for age. From Choon *et al.*, they saw more pediatric patients with psoriasis who were underweight as compared to noninflammatory controls. However, they also noted that the odds of excess adiposity, defined as BMI ≥85th percentile, was higher in pediatric psoriasis patients versus noninflammatory controls.[17]

As with other clinicodemographic profiles done on pediatric psoriasis, majority were treated with topical anti-inflammatory agents.[10,12,14,16]

The prevalence of pediatric psoriasis in this institution is higher than the estimated prevalence[3] from the global epidemiology of psoriasis but lower than that reported by Das and Adhicari.[11]

For the healthcare utilization data, which refer to the quantification of the use of services by patients, it can be seen in Table 3a that moderate–severe patients had more OPD consults, admissions, psoriasis treatment modalities, and laboratory workup, as expected. However, it is also the moderate–severe patients who had zero OPD consults. This may be attributed to the fact that these patients were initially seen in a different clinic or hospital and were only referred to this institution during a severe, uncontrolled disease phase or erythroderma. Once discharged improved, these patients also do not go back or are unable to do follow-up consults which could be due to financial constraints or geographic inaccessibility.

The average cost of hospitalization for pediatric psoriasis patients in this study is 17,967.17. Unfortunately, PHIC has yet to include psoriasis in the list of medical conditions that it covers.[18,19] The economic burden of psoriasis in the Philippines is high, and it was noted in the study of Zabala *et al.* that the 6-month indirect costs amounted to PHP 26,071.20 ($511) for employment status change and PHP 75,804.30 ($1,486) for work impairment while the direct cost was PHP 22,672.28 ($445).[1] Lobbying efforts have been made by various patient support and medical advocacy groups to have psoriasis included in the PHIC packages to address the unmet needs of the patients, especially of the indigent sector.[18-20] In 2021, House Bill 9821 or the National Psoriasis Care Act was approved by the House of Representatives Committee on Health.[20] The equivalent Senate Bill 1318 is currently pending in the Health and Demography Committee in the 19th Congress of the Senate.[21]

The limitations of this study include the unavailability of charts of some patients which led to selection bias and missing data on some variables, namely, family history of psoriasis, body surface area affected, nail and joint involvement, height, and weight. A prospective study to identify the clinicoepidemiologic factors of pediatric

psoriasis in the Philippines is recommended to address the limitations found in this study.

In contrast to previously done local studies, this present work on the clinicodemographic profile of pediatric psoriasis patients identified the frequency of the diagnosis at initial consult, lesion location at initial consult and throughout the disease, triggering factors, associated symptoms, nail and joint involvement, and treatment modalities used. In addition, healthcare utilization data which included OPD consults, hospital admissions, laboratory workup done, and cost covered by PHIC during admission were identified.

Conclusion

Most of the data gathered and presented here from a tertiary hospital in the Philippines are in agreement with published studies on pediatric psoriasis among Asian populations.

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Nil.

Conflicts of interest
There are no conflicts of interest.

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