

# Frequency, pattern and severity of nail changes in psoriasis determined By Nail Psoriasis Severity Index

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## Abstract

**Background** Psoriasis and nail disease are linked to discomfort, loss of function, deformity, and mental anguish.

**Objective** To determine the frequency, pattern and severity of nail changes in psoriasis.

**Methods** It is a descriptive cross sectional study that was held at OPD Department of dermatology, Jinnah Hospital-Lahore, Pakistan that enrolled 135 patients. Target Nail version of the nail psoriasis severity index scale was used to describe nail changes in which presence or absence of certain parameters were assessed clinically by magnifying glass. Each nail was given a score for nail matrix psoriasis from 0-32 included in Nail Psoriasis Severity Index (NAPSI), in that quadrant of nail. All the data was processed by SPSS v26.0. Frequency and percentages were used for categorical parameters. Chi square test was applied in which *P* value <.05 was considered significant.

**Results** Nail changes were observed in 81 patients (60.0%). Among nail changes pitting was most common. Severity of nail changes determined by NAPSI score was noted as mild in 76 patients (93.8%) and moderate in 5 patients (6.22%).

**Conclusion** We concluded that almost 60% patients with psoriasis had nail alterations, with pitting and subungual hyperkeratosis being the most prevalent.

**Keywords** Psoriasis; Nail Changes; Nail Psoriasis Severity Index Scale.

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## Introduction

Both hereditary and environmental factors play a significant role in psoriasis, a prevalent chronic, deformative, inflammatory, and proliferative skin disorder.<sup>1</sup> It is distinguished by distinct plaques with silvery, adhering scales. There are various forms of psoriasis that affect the skin, nails, and less often the joints, such as guttate, inverted, erythrodermic,

pustular, and plaque (the most common variety).<sup>2</sup> Psoriasis affects both men and women equally, and its age of onset exhibits a bimodal distribution.<sup>3</sup> Psoriasis affects 1.5 to 3% of people, and up to 50% of those who have it have nail involvement. This could eventually rise to 80-90% over the course of a lifetime. Almost 93% of people with nail psoriasis thought it was a major cosmetic disability.<sup>4</sup> Nail involvement is seen in association with all types of psoriasis of the skin along-with psoriatic arthropathy. A study done by Debra & Shari revealed that nail changes were present in 71 (71%) of psoriasis with mean duration of psoriasis 4.5 years.<sup>5</sup> The most frequently and severely affected

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nails were the fourth fingernail and the first toenail as revealed by one study.<sup>6</sup> Nail changes involved in psoriasis were pitting (60.6%), onycholysis (52.1%), ridges (40.8%), thinning (36.6%), grooves (23.9%), subungual hyperkeratosis(29.6%), nail plate discoloration (25%), uneven nail surface, splinter hemorrhages (12%), beau's lines(14%), longitudinal ridges (12%) and lastly chronic paronychia (10%).<sup>7</sup> The disease site affects the clinical presentation of psoriatic nails. The nail matrix is responsible for pits, ridges, and grooves, while the nail bed affection is responsible for onycholysis, subungual hyperkeratosis, splinter hemorrhages, and discoloration.<sup>8</sup> Currently, the Nail Psoriasis Severity Index (NAPSI) is the most widely used score to evaluate the degree of nail involvement.<sup>6</sup> The dynamics of clinical nail pathology and the effectiveness of applied treatment can be objectively assessed using the NAPSI approach.<sup>9</sup> The majority of the products in NAPSI are tailored to treat nail psoriasis.<sup>6</sup> Beau's lines and longitudinal ridges are much more common in psoriatic individuals but are not included in the NAPSI.<sup>10,11</sup> Due to absence of any study that has evaluated the severity of nail changes we conducted a pilot study on 30 patients with nail involvement with mild nail changes i.e. 73% among psoriasis patients. No case was noted with moderate or severe nail changes.

The rationale of present study was that psoriasis is a chronic skin disease that causes significant distress and morbidity. Nail involvement on the other hand is often overlooked. Studies have shown that approximately 50% of psoriatic have nail changes during their lives. Nail changes may be an isolated finding or it may accompany skin lesion. Nail involvement in psoriasis is a very bothersome problem for the patients as nails are difficult. Aim of present study was to determine the frequency, pattern and severity of nail changes in psoriasis. Thus this study helped in generating local evidence of frequency and severity of common nail changes among psoriatic patients and its correlation with skin disease at our clinical setups.

## **Methods**

This descriptive cross sectional study was held in Department of Dermatology, Jinnah Hospital, Lahore, Pakistan that enrolled 135 patients through non-probability purposive sampling. The sample size was estimated using the single population proportion formula with a 95% confidence level, 8.5% margin of error, and an assumed prevalence of 50%, yielding a minimum required sample size of 135 participants. After approval from ethical review board and informed consent from the patents (Ref. No. SC-009/ERB/34/AIMC/JHL, dated 18.06.2026), history was taken and physical examination was done. Severity of psoriasis calculated by PASI score (Psoriasis Area Severity Index) and time of onset of nail changes. Each nail was divided into four quadrants by one horizontal and one vertical line that were recorded on the proforma. Target Nail version of the Nail psoriasis severity index scale was used to describe nail changes in which presence or absence of certain parameters were assessed clinically by magnifying glass. Diagnosis of disease was clinical only. Each nail was given a score for nail matrix psoriasis from 0-32 and for nail bed psoriasis 0-32 depending upon the presence of any of eight features of nail psoriasis, included in NAPSI, in that quadrant of nail.<sup>12</sup>

Degree of nail involvement was determined by NAPSI, graded as follow:

Mild- NAPSI score less than 192.

Moderate- NAPSI score 192 to 320.

Severe- NAPSI score more than 320.

Patients of either gender having age from 20-65years with a clinical diagnosis of psoriasis as per operational definition were enrolled in study. Patients with nail changes either secondary to trauma or caused by concomitant dermatological disease along with psoriasis e.g, lichen planus, eczema, vitiligo and tinea were excluded from study.

Primary outcome measure: Frequency (prevalence) of nail changes in psoriasis patients, determined by the proportion of patients showing any nail involvement on clinical examination using the Nail Psoriasis Severity Index (NAPSI). Secondary outcome measures: Pattern of nail changes (types such as pitting, subungual hyperkeratosis, onycholysis, etc.) and severity of nail involvement classified by NAPSI score as mild, moderate, or severe.

All the data was processed by SPSS v26.0. Mean±SD was used for quantitative variables while categorical variables were described as frequency and percentages. Chi square test with *P* value ≤.05 was taken as significant. We did not mention any correlation in our study.

### Result

Distribution among enrolled patients (n=135) for gender, age, severity of disease and nail changes were presented as percentage in **Table 1**. Mean±SDs for age was 37.39±12.10 years.

Most common type of psoriasis was plaque psoriasis 94 (69.6%) followed by erythrodermic Psoriasis 13 (9.6%) as shown in **Table 2**.

Different types of nail changes were noted in psoriatic patients and their distribution among subjects in terms of frequency and percentages were shown in **Table 3**.

**Table 1** Baseline information regarding enrolled patients (n=135)

<i>Outcome</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Genders		
Males	92	68.1
Females	43	31.9
Age groups (Yrs.)		
20-40	82	60.7
41-60	53	39.3
Severity of psoriasis		
Mild	96	71.1
Severe	39	28.9
Nail Changes		
Yes	81	60
No	54	40

**Table 2** Distribution of cases by type of psoriasis.

<i>Psoriasis</i>	<i>Number</i>	<i>Percentage (%)</i>
Plaque psoriasis	94	69.66
Guttate psoriasis	10	7.44
Pustular psoriasis	05	3.7
Inverse PS	02	1.55
Erythrodermic PS	13	9.66
Palmo-planter psoriasis	07	5.22
Acral psoriasis	04	3.00

**Table 3** Distribution of different nail changes among psoriatic patients.

<i>Nail changes</i>	<i>Number</i>	<i>Percentage (%)</i>
Pitting	61	75.33
Crumbling	20	24.77
Beau's lines	17	21
Longitudinal ridging	17	21
Leukonychia	26	32
Onycholysis	34	42
Splinter hemorrhage	15	18.55
Red spot in lunula	07	8.66
Subungual Keratosis	40	49.44
Oil drops sign	09	11.11
Chronic paronychia	17	21

Severity of nail changes determined by NAPSI score noted as mild (n=76) and moderate (n=5) as shown in **Table 4**.

Stratification of severity of psoriatic nail changes with respect to severity of psoriasis was done. It showed that 51 patients with mild psoriasis had mild nail changes as shown by **Table 5**.

### Discussion

Nail involvement is a common and clinically significant manifestation of psoriasis and is increasingly recognized as a marker of disease severity and a predictor of psoriatic arthritis. Recent studies report that nail psoriasis affects nearly 40-50% of patients with cutaneous psoriasis, while lifetime prevalence may reach up to 80-90%, particularly in patients with long-standing disease and joint involvement.<sup>12-14</sup> In the present study, nail changes were observed in 60% of patients, which is consistent with these published findings and supports the high burden of nail disease among psoriatic patients. Slight variations in prevalence

**Table 4** Severity of nail changes determined by NAPSI score (n=81).

Severity	Number	Percentage (%)
Mild (Score < 192)	76	93.8
Moderate (Score 193-320)	05	6.2

**Table 5** Stratification of severity of psoriatic nail changes with respect to severity of psoriasis.

Severity of nail changes determined by NAPSI score	Severity of psoriasis		P-value
	Mild	Severe	
Mild (Score < 192)	51	25	*1.00
Moderate (Score 193-320)	04	01	

\*Chi-square

across studies may be explained by differences in study design, ethnic background, disease duration, severity of skin involvement, and methods used for nail assessment.

Male predominance was observed in the present study, although some studies have reported a higher prevalence among females or no significant gender difference.<sup>15,16</sup> These differences reflected regional healthcare-seeking behavior, occupational exposure, cosmetic concerns, or sociocultural factors rather than true biological variation. In addition, the present study demonstrated that increasing severity of skin psoriasis was associated with greater frequency and severity of nail involvement. This finding was supported by previous studies showing that nail psoriasis is often correlated with higher Psoriasis Area and Severity Index (PASI) scores and may indicate a greater systemic inflammatory burden.<sup>17,18</sup> Nail disease has also been strongly associated with psoriatic arthritis, particularly distal interphalangeal joint involvement, emphasizing its prognostic importance.<sup>19</sup>

Regarding the pattern of nail changes, pitting was the most frequent abnormality observed, followed by subungual hyperkeratosis. This is in agreement with earlier studies identifying pitting as the most common manifestation of nail matrix involvement and subungual hyperkeratosis as a frequent sign of nail bed disease.<sup>20,21</sup> Similar findings have been

reported in both regional and international studies where pitting constituted more than two-thirds of nail abnormalities.<sup>22</sup> Dermoscopic and ultrasonographic studies have further supported the predominance of matrix-related changes and have improved the sensitivity of detecting subclinical nail involvement.<sup>23,24</sup> In contrast, some studies have reported onycholysis, oil-drop discoloration, or splinter hemorrhages as more frequent findings, likely due to differences in disease chronicity, treatment status, and genetic predisposition.<sup>25</sup>

Most patients in the present study had mild nail involvement according to NAPSI scoring, while only a small proportion showed moderate disease. Similar findings have been reported in previous studies where mild nail disease predominated and severe nail changes were less frequent in outpatient settings.<sup>26</sup> This may reflect earlier clinical presentation or underestimation due to reliance on clinical examination without adjunctive tools such as dermoscopy or ultrasound. Furthermore, no statistically significant association was observed between nail severity and disease duration. While some studies suggest that longer disease duration contributes to cumulative nail damage, others report inconsistent findings, particularly in cross-sectional studies where temporal progression cannot be adequately assessed.<sup>18,26</sup>

## Conclusion

Nail involvement was observed in a substantial proportion of psoriasis patients, with pitting and subungual hyperkeratosis representing the most common clinical patterns. Most patients demonstrated mild nail disease according to NAPSI scoring. These findings emphasize the importance of routine nail examination in all patients with psoriasis, as nail changes may reflect overall disease burden and may serve as an early indicator of more severe systemic involvement, including psoriatic arthritis. Early identification and standardized assessment of nail psoriasis may improve disease monitoring and patient quality of life.

### **Limitations**

This study had several limitations. Being a single-center study, the findings may not be generalizable to the wider population. The use of non-probability purposive sampling may have introduced selection bias. Nail involvement was assessed clinically without objective diagnostic confirmation using dermoscopy, ultrasound, or histopathological examination, which may have affected diagnostic precision. Inter-observer reliability was not assessed, which may have influenced consistency in NAPSI scoring. Statistical analysis was limited to descriptive measures and chi-square testing without multivariable adjustment for potential confounding factors such as disease duration, treatment status, or presence of psoriatic arthritis. In addition, the cross-sectional design limits the ability to establish causal relationships or evaluate progression of nail disease over time.

**Declaration of patient consent** Authors certify that they have obtained all appropriate patient consent.

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**Conflict of interest** No conflict of interest.

### **Author's contribution**

**SK, RM:** Substantial contribution to conception, study design and manuscript writing.

**BB, SA:** Substantial contribution to acquisition of data and manuscript writing.

**GB:** Substantial contribution to analysis and interpretation of data and critically review the manuscript.

**NJ:** Substantial contribution to conception and study design, and critically review the manuscript.

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