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ORIGINAL ARTICLE

The impact of nail psoriasis on disease activity, quality of life, and clinical variables in patients with psoriatic arthritis: A cross-sectional multicenter study

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Abstract

Aim: Nail involvement is common in psoriatic arthritis. This study assesses clinical characteristics, nail psoriasis prevalence, and impact of nail psoriasis on disease activity in patients with psoriatic arthritis (PsA).

Method: This cross-sectional multicenter study was conducted by the Turkish League Against Rheumatism using PsA patients recruited from 25 centers. Demographic and clinical characteristics of PsA patients, such as disease activity measures, quality of life, and nail involvement findings were assessed during routine follow-up examinations. Patients were divided into two groups according to the presence or absence of nail psoriasis and compared using the χ^2 test or Fisher exact test for categorical variables and the t-test or Mann-Whitney *U* test for continuous variables.

Results: In 1122 individuals with PsA, 645 (57.5%) displayed nail psoriasis. The most frequent features of fingernails were ridges (38%), followed by pitting (21%) and onycholysis (19%). More females were present in both groups (with and without nail psoriasis; 64% vs 67%, $P < 0.282$). Patients with nail psoriasis were older, indicated more pain and fatigue, experienced greater swelling, tender joint counts, and skin disease severity, and had a higher disease activity score compared with those without nail psoriasis (all $P < 0.05$).

Conclusion: We demonstrate an increased prevalence of nail psoriasis observed in patients with psoriatic arthritis. Patients with nail involvement experience increased disease activity, lower quality of life, and diminished mental and physical status compared with those without nail involvement.

KEYWORDS
clinical characteristics, disease activity, nail involvement, nail psoriasis, psoriatic arthritis, quality of life

1 | INTRODUCTION

Psoriatic arthritis (PsA) is a chronic, immune-mediated systemic disease that may present with arthritis, dactylitis, enthesitis, spondylitis, and skin and nail disease, as well as a variety of linked comorbidities, such as uveitis, osteoporosis, cardiovascular disease, and subclinical inflammatory bowel disease.[1–3] Psoriasis is an inflammatory disease of the skin, present in 1%-3% of the worldwide population and is associated with cancer, diabetes, metabolic syndrome, and cardiovascular disease.[2,4–6] PsA prevalence varies between 6% and 41% in patients with psoriasis.[7–9] Nail involvement prevalence in patients with PsA ranges from 41% to 93%[7] and from to 15% to 50%,[7,10] among patients with psoriasis. Nail psoriasis is seen alone in about 1%-5% of patients.[11] Changes to the nails, such as crumbling, pitting (shallow depressions), leukonychia (white discoloration), onychorrhexis (longitudinal nail ridges, splits, or fissures), or red spots in the lunula occur in matrix involvement,[10,12] whereas onycholysis (disjunction between the nail bed and nail plate), splinter hemorrhages, subungual hyperkeratosis (thickening of the nail plate), and oil-drop discoloration (salmon patches) occur in nail bed involvement.[13] Pitting is not specific to psoriasis—it is observed in chronic eczema and alopecia areata—but 10 pits on a single nail or more than 50 pits on all nails are considered evidence of psoriasis.[14] Oil-drop discoloration is a quite specific finding for nail psoriasis; however, indicators such as onycholysis, other discoloration, and subungual hyperkeratosis are sensitive but less specific.[13,14]

The presence of psoriatic nail disease is accepted as evidence of the development of PsA.[15,16] A microanatomical relation between nail involvement and specific disease features, such as dactylitis and enthesitis,[17] has established that these are accepted hallmarks of PsA. Moreover, a link between erosive distal interphalangeal (DIP) joint involvement and nail disease features has been demonstrated in previous studies.[18,19] In addition, an imaging study has shown that DIP joint involvement is secondary to nail involvement in PsA patients.[20] The Group for Research and Assessment of Psoriasis and Psoriatic Arthritis recommendations emphasizes the recognition and management of each of the main manifestations of PsA (enthesitis, dactylitis, skin disease, nail disease, axial disease, and peripheral

arthritis) as well as the screening for and treatment of comorbidities.[21] National and international guidelines for psoriasis management prioritize treatment selection.[22,23] Currently, various local or systemic treatment options are available depending on the severity of nail psoriasis. Treatment can prevent pain, stress, and a worsening quality of life.[24]

Psoriatic nail disease is associated with pain, severe joint[19] and skin involvement,[25] psychological stress,[10,26] poor quality of life, and higher disease activity in patients with psoriasis[25] and with PsA.[27] The harmful and negative effects of nail involvement may be more serious in PsA patients than in psoriatic patients.[28] Nail psoriasis is frequently scored using designated tools, including the nail psoriasis severity index (NAPSI) or nail visual analog scale (VAS). The present study focused on the particular features of psoriatic nail change, including ridging[29] (not included in the NAPSI), pitting, onycholysis, splinter hemorrhages, subungual hyperkeratosis, and oil-drop discoloration instead of the NAPSI. Although studies have raised awareness of nail disease as a pioneer sign and an indicator of the occurrence of PsA,[26] these are relatively scarce. Accordingly, we assessed clinical characteristics, nail psoriasis prevalence, and the impact of nail psoriasis on disease activity in PsA patients.

2 | MATERIALS AND METHODS

This cross-sectional multicenter study was conducted by the Turkish League Against Rheumatism PsA Network using patients recruited from 25 hospitals in Turkey. Individuals who met the Classification Criteria for Psoriatic Arthritis (CASPAR) criteria[30] were enrolled after informed consent was obtained. The study adhered to the Helsinki Declaration, and its protocol was approved by the local ethics committee of Sakarya University. Patients under 18 years of age or presenting with malignancy or with other rheumatic conditions, such as systemic sclerosis, rheumatoid arthritis, or systemic lupus erythematosus, were not accepted. Patients were divided into two groups for those who had nail psoriasis and those without nail psoriasis.

The following demographic and clinical variables of all patients were evaluated: age, sex, body mass index, age at onset of disease, disease duration, and severity and type of skin psoriasis. Using various methods, the characteristics of the following disease-related symptoms were calculated: pain (VAS-P), fatigue (VAS-F), patient global assessment (VAS-PtG), physician global assessment (VAS-PG), swollen joint counts (SJC) (0-66), and tender joint counts (TJC) (0-68). Other tools used in this study were the Functional Assessment of Chronic Illness Therapy (FACIT),[31] Short-Form 36 (SF-36),[32] Fibromyalgia Rapid Screening Tool (FIRST),[33] PsA Quality of Life Questionnaire (PsAQoL),[34] Hospital Anxiety and Depression Scale (HADS),[35] Disease Activity Score 28-joint count C-reactive protein (DAS28-CRP), the Bath Ankylosing Spondylitis Disease Activity Index (BASDAI),[36] the Bath Ankylosing Spondylitis Functional Index (BASFI),[37] and the Psoriasis Area Severity Index (PASI).[38]

The patients' fingernails and toenails were evaluated and existing nail changes were recorded, including pitting, onycholysis, longitudinal ridging, splinter hemorrhages, subungual hyperkeratosis, and oil-drop discoloration.[10] Nail psoriasis features were detected as one or more types of changes on the fingernails and toenails.

SPSS version 22 (IBM, Armonk, NY, USA) software was used for statistical analysis. Distribution of the data for normality was analyzed using the Kolmogorov-Smirnov test. The difference between groups was determined by Student *t* test or the Mann-Whitney *U* test. The χ^2 test or the Fisher exact test was used for analysis of categorical data, if suitable. The results of parametric variables are stated as mean (± standard deviation); the results of nonparametric variables are stated as median and interquartile range. Percentages and frequencies are used for categorical variables.

3 | RESULTS

For this study, 1122 patients with PsA (65% of them female) were recruited. Comparisons between demographic and clinical characteristics of patients with nail psoriasis and those without are presented in Table 1. Of the 1122 patients, 645 (57.5%) had nail psoriasis. Female patients dominated both groups; 64% of the group with nail psoriasis and 67% of the group without (410 vs 318; $P = 0.282$). In patients with nail psoriasis, the median age and body mass index were statistically higher than in patients without (48 vs 46 years and 29 vs 28 kg/m^2 respectively: both $P < 0.05$). In terms of median age of disease onset, age of diagnosis, first symptom duration, diagnosis duration, mean inflammatory back pain, spondylitis, peripheral arthritis, enthesopathy, and dactylitis, the two groups were similar (all $P > 0.05$) (Table 1).

Although the monoarthritis, polyarthritis, and oligoarthritis subtypes of PsA were higher in the nail involvement group than in the group without ($P < 0.05$), there was no statistically significant difference between the two groups in terms of DIP joint arthritis and arthritis mutilans ($P > 0.05$). The proportion of patients receiving corticosteroids and conventional synthetic disease-modifying antirheumatic drugs (csDMARD) was higher in patients with nail psoriasis (all $P < 0.05$). There was no difference in the two groups of patients between biological and targeted synthetic DMARD and combination DMARD therapies (all $P > 0.05$). Patients with nail psoriasis had a higher median score on PtGA, PGA, VAS-P, VAS-F, FACIT, TJC, SJC, CRP level, and DAS28-CRP than patients without nail psoriasis (all $P < 0.05$). Median BASDAI, BASFI, and ESR scores were similar between both groups ($P > 0.05$). The median PsAQoL and HADS-anxiety scores were higher, and median SF-36 Mental component and SF-36 Physical component scores were lower in patients with nail psoriasis than without (all $P < 0.001$). The HASD-depression scores were similar in both groups.

TABLE 1 Comparison of demographic and clinical characteristics, and of subtype of joint disease in groups of patients with PsA with nail psoriasis vs those without nail psoriasis

	With nail psoriasis		Without nail psoriasis		
	57.5% (n = 645)		42.5% (n = 477)		
	Valid n		Valid n		*P*
Gender, female, n (%)	645	410 (64)	477	318 (67)	0.282
Age (years), median (IQR)	645	48 (39-56)	477	46 (37-54)	**0.001**
BMI (kg/m^2), median (IQR)	645	29 (25-32)	477	28 (25-31)	**0.02**
Age of disease onset (years), median (IQR)	520	30 (20-42)	379	29 (19-39)	0.194
Age of diagnosis (years), median (IQR)	520	31 (20-42)	379	30 (20-40)	0.261
Symptom duration (years), median (IQR)	645	7 (3-14)	477	6 (3-13)	0.065
Diagnosis duration (years), median (IQR)	645	5 (2-10)	477	4 (1-10)	0.205
Inflammatory back pain, n (%)	645	290 (45)	477	230 (48)	0.279
Spondylitis, n (%)	645	258 (40)	477	167 (35)	0.089
Peripheral arthritis, n (%)	645	426 (66)	477	290 (61)	0.07
Enthesopathy, n (%)	645	274 (42)	477	185 (39)	0.213
Dactylitis, n (%)	645	223 (35)	477	101 (21)	0.224
Subtypes of PsA, n (%)					
Monoarthritis	645	60 (9)	477	55 (12)	**<0.001**
Oligoarthritis	645	175 (27)	477	102 (21)	**0.027**
Polyarthritis	645	179 (28)	477	93 (19)	**0.001**
DIP joint arthritis	645	30 (5)	477	13 (3)	0.097
Arthritis mutilans	645	3 (0.5)	477	1 (0.2)	0.478
Current medication, n (%)					
csDMARD	645	365 (57)	477	239 (50)	**0,007**
b/tsDMARD	645	171 (27)	477	144 (30)	0,121
Combination DMARD	645	62 (10)	477	42 (9)	0,495
Corticosteroids	645	69 (11)	477	36 (8)	**0,027**
PtGA, median (IQR)	645	5 (3-6)	477	4 (2-6)	**0.002**
PGA, median (IQR)	645	4 (2-5)	477	3 (2-5)	**<0.001**
VAS-P, median (IQR)	645	5 (3-7)	477	5 (2-6)	**0.005**
VAS-F, median (IQR)	645	5 (4-8)	477	5 (2-7)	**<0.001**
FACIT score, median (IQR)	645	20 (12-27)	477	17 (10-25)	**<0.001**
ESR (mm/hour), median (IQR)	645	17 (10-28)	477	15 (9-26)	0.168
CRP (mg/L), median (IQR)	645	3 (1-7)	477	3 (1-5)	**0.01**
BASDAI score (0-10), median (IQR)	560	4 (3-6)	375	4 (3-6)	0.178
BASFI score (0-10), median (IQR)	433	3 (2-5)	282	3 (2-5)	0.051
Tender joint count, median (IQR)	497	5 (2-10)	296	3 (2-8)	**<0.001**
Swollen joint count, median (IQR)	290	2 (1-4)	167	2 (1-3)	**0.011**
DAS28-CRP score, median (IQR)	613	3 (3-4)	432	3 (2-4)	**<0.001**
PsAQoL score, median (IQR)	645	6 (1-12)	477	4 (1-10)	**0.001**
HADS-anxiety score, median (IQR)	645	7 (4-10)	477	6 (3-9)	**<0.001**
HADS-depression score, median (IQR)	645	7 (4-9)	477	6 (3-9)	0.104
SF-36 PC score, median (IQR)	645	54 (35-76)	477	63 (41-79)	**<0.001**
SF-36 MC score, median (IQR)	645	54 (36-74)	477	65 (39-76)	**<0.001**
FIRST score, median (IQR)	645	2 (0-5)	476	2 (0-4)	**0.006**
PASI head score, median (IQR)	645	0 (0-0)	477	0 (0-0)	**<0.001**

TABLE 1 (Continued)

	With nail psoriasis		Without nail psoriasis		
	57.5% (n = 645)		42.5% (n = 477)		
	Valid n		Valid n		*P*
PASI trunk score, median (IQR)	645	0 (0-1)	477	0 (0-0)	**<0.001**
PASI upper extremities score, median (IQR)	645	1 (0-1)	477	0 (0-1)	**<0.001**
PASI lower extremities score, median (IQR)	645	1 (0-2)	477	0 (0-1)	**<0.001**
PASI total score, median (IQR)	645	2 (1-4)	477	1 (0-2)	**<0.001**

Note: Data are shown as median percentage with interquartile range (IQR).

Abbreviations: BASDAI, Bath Ankylosing Spondylitis Disease Activity Index; BASFI, Bath Ankylosing Spondylitis Functional Index; b/ts, biological and targeted synthetic; BMI, body mass index; CRP, C-reactive protein; csDMARDs, conventional synthetic disease-modifying antirheumatic drugs; DAS28, Disease Activity Score 28; ESR, erythrocyte sedimentation rate; FACIT, Functional Assessment of Chronic Illness Therapy; FIRST, Fibromyalgia Rapid Screening Tool; HADS, Hospital Anxiety and Depression Scale; MASES, Maastricht Ankylosing Spondylitis Enthesitis Score; PASI, Psoriasis Area and Severity Index; PGA, Physician Global Assessment; PsA, psoriatic arthritis; PsAQoL, Psoriatic Arthritis Quality of Life; PtGA, patient global assessment; SF-36 MC, Short Form 36 Mental Component; SF-36 PC, Short Form-36 Physical Component; VAS, visual analogue scale.

Bold value indicates Statistically significant *P* values.

Although total PASI scores were lower in all groups, patients with nail psoriasis scored higher ($P < 0.001$), demonstrating the severity of skin disease activity. PASI body part (head, upper extremities, trunk, and lower extremities) scores were higher in the nail psoriasis group than in the other group (all $P < 0.001$).

Psoriatic nail changes were present in 57.5% of the study population. As illustrated in Table 2, the most common morphological nail psoriasis feature observed on the fingernails was ridging (467; 38%), followed by pitting (252; 21%), onycholysis (120; 10%), subungual hyperkeratosis (91; 8%), oil-drop discoloration (41; 3%), and splinter hemorrhages (11; 1%). Psoriatic nail changes observed on the toenails were ridging (349; 29%), subungual hyperkeratosis (164; 14%), onycholysis (144; 12%), pitting (86; 7%), and oil-drop discoloration (26; 2%).

Features of skin disease presented as psoriasis vulgaris (905; 81%), scalp psoriasis (124; 11%), palmo-plantar psoriasis (49; 4%), erythrodermic psoriasis (33; 3%), generalized psoriasis (29; 3%), pustular psoriasis (30; 3%), and guttate psoriasis (30; 2%). Skin diseases were present concurrently in 825 (74%) patients, a history of skin disease was indicated in 269 (24%) patients, and 28 (2%) patients had no signs or history of skin disease.

4 | DISCUSSION

Our study revealed that 57.5% of patients with PsA experience psoriatic nail change, and the proportion of women was higher in both groups: those with nail psoriasis and those without nail psoriasis. Patients with nail psoriasis were slightly older, had a higher body mass index, and their increased disease activity was indicated by their elevated pain, fatigue, anxiety, and CRP levels, and higher SJC, TJC, PASI, DAS28, FACIT, and FIRST scores. PsA patients with nail involvement reported a more impaired quality of life as demonstrated by the PsAQoL and diminished physical and mental status as measured by the SF-36 Mental component and SF-36 Physical component scores than patients without nail psoriasis (all $P < 0.001$). Subtypes of PsA, including monoarthritis, oligoarthritis, and polyarthritis, were more common in patients with nail psoriasis. Ridging was a common feature of nail involvement in both fingernails and toenails. Pitting, onycholysis, and subungual hyperkeratosis were observed frequently in the fingernails of patients with nail psoriasis.

Nail psoriasis is frequently accompanied by psoriatic arthritis, as exemplified by various studies that explored the association between nail change and small joint or DIP joint arthritis.[20,39,40] The literature indicated up to 80% prevalence in psoriatic arthritis patients and up to 50% in psoriasis patients.[13] Various studies examined nail psoriasis as a risk factor for the development of PsA; however, those that explored the potential influence of nail psoriasis on disease activity and clinical parameters in PSA patients were scarce. To our knowledge, the current study is one of few studies—including five that comprehensively evaluated the impact of nail psoriasis on clinical characteristics[15,20,26,27,41] and six that reported outcomes[19,39,40,42–44]—in PSA patients using data from a Turkish League Against Rheumatism cross-sectional study.

A recent study published by Mease et al[27] compared work productivity and disease activity measures in PSA patients with and without nail psoriasis and indicated that nail psoriasis, found in 40.5% of PsA patients, was associated with increased disease activity measures as demonstrated by the SJC, TJC, Disease Activity in Psoriatic Arthritis, and Psoriatic Arthritis Disease Activity Score. Our study results have expanded on this finding, demonstrating that patients with nail psoriasis had high disease activity, poorer quality of life, and impaired mental and physical states. Mease et al[27] measured nail involvement using the nail VAS, whereas the present study assessed by particular types of nail psoriasis features. Although nail psoriasis prevalence was lower than found in our study, this can be attributed to the higher proportion of their patients who underwent biological drug therapy (31%), whereas in our study, more patients with nail psoriasis received csDMARD and steroid therapies. In terms of receiving biological therapy in the current study, both groups of patients, with and without nail psoriasis, were similar.

TABLE 2 Detailed information of skin and nail findings of patients with PsA

	n = 1122	%
Type of psoriasis		
Psoriasis vulgaris	905	81
Erythrodermic psoriasis	33	3
Pustular psoriasis	30	3
Generalized psoriasis	29	3
Palmoplantar psoriasis	49	4
Scalp psoriasis	124	11
Guttate psoriasis	30	2
Skin findings		
Currently present	825	74
History	269	24
Never	28	2
Frequency of fingernail changes		
None	530	44
Ridging	467	38
Onycholysis	120	10
Pitting	252	21
Splinter hemorrhages	11	1
Subungual hyperkeratosis	91	8
Oil-drop discoloration	41	3
Frequency of toenail changes		
None	582	48
Pits	94	8
Ridging	349	29
Onycholysis	144	12
Pitting	86	7
Splinter hemorrhages	6	0
Subungual hyperkeratosis	164	14
Oil-drop discoloration	26	2
Location of skin disease		
Ears	216	19
Scalp	531	47
Umbilicus	212	19
Extensor areas of extremities	771	69
Gluteal cleft	82	7

Although the influence of nail psoriasis on PsA patients' quality of life is known,[45] it is often overlooked. We showed that the PsAQoL score of patients with nail involvement was higher than in patients without nail involvement ($P < 0.001$). It is one of the few studies to do so. In addition, previous studies suggested an association between onycholysis and severity of skin and joint disease.[39,43,46] Other studies reported the connection between nail psoriasis features, including onychorrhexis, Beau lines, and nail alterations as mentioned in the NAPSI, and joint disease, especially DIP joint arthritis.[26,40,41] Our study indicated that the two groups were similar in terms of DIP joint arthritis, whereas the PASI scores and proportion of monoarthritis, oligoarthritis, and polyarthritis were higher in patients with nail psoriasis. These data reflect the findings of previous scholars.[42] In addition, although joint involvement occurs 5 or 10 years after the skin disease, it may sometimes accompany the initial symptoms, and sometimes it may not occur at all.[3] It has been reported that nail psoriasis leads to the development of joint disease and appears a few years before the onset of symptoms of arthritis.[47] Moreover, nail lesions are seen as early evidence of the development of arthritis.[16,26] According to these, and because the patients did not remember exact symptom onset times, our study did not evaluate whether nail lesions developed before or after the onset of arthritis.

The clinical manifestations of nail psoriasis in our study patients were assessed using the most common characteristic nail psoriasis changes, which were also evaluated in previous studies.[11,26] Our study upholds earlier research by showing that ridging is the most prevalent nail change in fingernails, followed by pitting, onycholysis, and subungual hyperkeratosis.[11,40,41,46] Ridging is a common proximal nail matrix change but not a characteristic psoriatic nail change; it can be caused by other factors, such as aging, the environment, and rheumatoid arthritis.[41] As such, it is not surprising that it is seen as the most frequent change.

Sandre et al[41] explored the association between specific psoriatic nail changes and hand joint arthritis and revealed that pitting and onycholysis, splinter hemorrhages were common changes caused by nail psoriasis in PsA patients; our study was compatible with these results. The most common special nail change features in fingernails are pitting, onycholysis, and subungual hyperkeratosis. In our study, the most common toenail psoriatic change features were subungual hyperkeratosis (14%), onycholysis (12%), and pits (8%). The psoriatic nail features of our study are similar to those reported in previous studies.[43,46]

Although ridging and onychorrhexis are mentioned in the literature, it is debated whether onychorrhexis, or longitudinal ridging, or nail fissures are frequently observed in the nails of patients with psoriasis of long-duration.[11,41,48] Salomon et al[11] showed that pitting and longitudinal ridging of the nail matrix were commonly observed in fingernails, whereas hyperkeratosis is the most frequent nail change in fingernails and toenails of patients with psoriasis. We reported similar findings. Scarpa et al[20] used magnetic resonance imaging to perform nail and joint imaging and found that nail involvement was commonly associated with distal phalanx involvement, but not with DIP joint involvement. We also found no difference in DIP joint involvement between those with and without nail involvement. The majority of the literature discusses the relationship between characteristic nail lesions and joint involvement.[18,40,43,46] In addition, scalp psoriasis, long disease duration, and the severity of the skin disease are associated with the development of PsA; but longer studies are required for evidence of PsA development.

Considering the negative effects of nail involvement and the burden of the disease for patients, early treatment is a necessity. Current treatment guidelines recommend that treatments be planned with the patient and take into consideration the presence and/or absence of all the features of PsA or its severity.[6,21–23] If a small number (up to three) of nails are involved, topical vitamin D analogues, topical steroids, or local steroid injections can be given, either alone or as combination therapy.[24,49] In cases with the involvement of more

than three nails, increased skin disease and arthritis, and a worsening quality of life, systemic treatments, such as csDMARD or biological treatments, are recommended.[23,24,49] In our study, many of the patients received csDMARD therapy, namely, both patients with nail involvement (57%) and patients without nail involvement (50%). The fact that the rate of nail involvement (57.5%) in our study was higher than that (40%) in the study of Mease et al[27] may be a result of our more widespread use of csDMARD treatments.

The strength of this study is that in terms of nail psoriasis, it is one of the few that comprehensively evaluates PsA patient characteristics, while changes are assessed by special psoriatic nail features. There were some limitations in the study. One limitation is that the NAPSI tool was not used to assess the intensity of nail alterations, nor was dermoscopy used to examine nail abnormalities. Examination with the naked eye alone may have caused some nail changes to be overlooked. If we had used the NAPSI or dermoscopy, the validity of our study findings would undoubtedly have increased. The use of dermoscopy can be useful in recognizing early nail changes and may help in rapid diagnosis in cases of atypical clinical features of psoriatic nails.[50] However, the literature on the use of the NAPSI by rheumatologists is controversial. The use of the NAPSI by untrained rheumatologists may reduce its reliability.[51] Not all participating physicians had been trained in the NAPSI before the present study began, which is why we chose not to use it. Another limitation of the study is that, because of its cross-sectional nature, it was not possible to evaluate which clinical parameters improved with treatment. A limitation of our study was that considerable data were missing when we performed the statistical analyses for the TJC, SJC, BASDAI, BASFI, and DAS28. In some cases, where both axial disease and peripheral arthritis were present, it was a result of the incomplete processing of the findings in the case report form. Finally, using the DAS28-CRP as the disease activity score limited our findings, because it evaluated only 28 joints and might not have reflected the full disease activity in PsA patients.

5 | CONCLUSION

This study has shown that nail psoriasis is an often-overlooked feature of PsA, and PsA patients with nail psoriasis experience increased disease activity, lower quality of life, and diminished mental and physical status compared with those patients without nail psoriasis.

AUTHOR CONTRIBUTIONS

All authors contributed to the study conception, design, and data acquisition. Interpretation and analysis of data were performed by GC, KN, and YK. The manuscript's first draft was written by GC. KN and YK participated in drafting and revising the manuscript. All authors commented on previous versions of the manuscript and all authors approved the final version of the manuscript. KN has full access to all of the data in the study and takes responsibility for the integrity of the data. All co-authors are fully accountable for all aspects of the work.

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CONFLICT OF INTEREST

The authors report no conflict of interest or funding source.

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