

Correlation between nail psoriasis severity index score with quality of life in nail psoriasis



Abdul Arif^{*}, Irma Damayanti Roesyanto Mahadi², Ariyati Yosi²

ABSTRACT

Background: Psoriasis is a recurring chronic inflammatory disease, which can involve the skin, nails and joints. Nail psoriasis occurred in 50% of psoriasis patients. Nail psoriasis can interfere with the quality of life (QoL) due to its physical, mental, and social impacts. To determine the correlation between Nail Psoriasis Severity Index (NAPSI) score and QoL in nail psoriasis patients.

Methods: This was a correlative analytical study with a cross-sectional approach that involved nail psoriasis subjects aged ≥ 18 years. Data accessed from the recording of basic data. The examination of subjects included an assessment of NAPSI scores and the Nail Psoriasis Quality of Life (NPQ10) questionnaire. Statistical analyses were performed using Pearson's correlation coefficients, with $P < 0.05$ was considered statistically significant.

Results: A total of 26 subjects with nail psoriasis, with the highest proportion, were female (57.7%), age group of 48–57 years (34.6%), duration of psoriasis > 5 years (76.9%), NAPSI score 81–100 (30.8%), the mean NAPSI score was 89.42 ± 32.01 , and the mean NPQ10 score was 6.96 ± 3.30 . There was a significant moderate positive correlation between the NAPSI score and QoL ($r = 0.632$, $p = 0.001$).

Conclusion: The higher the NAPSI scores, the worse the quality of life for nail psoriasis patients.

Keywords: nail psoriasis, NAPSI, NPQ10, quality of life.

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INTRODUCTION

Psoriasis is a recurring chronic inflammatory disease, which can involve the skin, nails, and joints.¹ Psoriasis is characterized by immune-mediated skin inflammation, epidermal hyperplasia, and an increased risk of painful and destructive arthritis as well as cardiovascular morbidity and psychosocial challenges.¹ In the skin, psoriasis lesions can be in reddish patches with firm boundaries with thick scales with pain, itching, and prickling sensation.^{1,2} Symptoms can also be found in nails and joints, which can cause disability or discomfort. Nail psoriasis can occur in 50% of psoriasis patients.² The characteristics of nail psoriasis are pitting, leukonychia, red spot in lunula, crumbling, oil drop (salmon patch), onycholysis, subungual hyperkeratosis, and splinter hemorrhage. Psoriatic inflammation of the nail can result in nail matrix and nail

bed.^{1,2}

Psoriasis' prevalence can be found in 2% of the world population, but its prevalence varies from 0.09% to 11.4%, and psoriasis is included in global issues.² The prevalence of psoriasis lower in Asia, and more than 25.000 in Andean Indians, no case has been seen.^{1,2} National data on the prevalence of psoriasis in Indonesia is unknown. The total of psoriasis vulgaris patients in the polyclinic of the Immunodermatology Division in Dermatology and Venereology Department of Haji Adam Malik General Hospital Medan, January - December 2015 reported 89 psoriasis patients (2.94%) from 3,021 visits.³ Nail psoriasis can occur in the absence of a psoriasis rash in the skin; 5% of nail psoriasis patients do not have skin disorders. 10%-55% of skin psoriasis patients have nail psoriasis, and 53%-86% of patients with arthritis psoriasis accompanied by nail disorders.⁴

Nail Psoriasis Severity Index (NAPSI) was used to establish a severity score for nail psoriasis. NAPSI provides a simple, numerical, reproducible, and objective scoring system for evaluating nail psoriasis that includes the level of involvement and location in the nail anatomy of psoriasis pathological changes.⁵ Based on a study by Kacar et al. reported that the mean severity of 45 nail psoriasis patients using the NAPSI score was 7.87 ± 5.42 .⁶ Rajashekar et al. reported that nail psoriasis patients had a mean total NAPSI score of the fingernails was 23.81 ± 21.57 , and the toenails were 18.02 ± 12.21 . NAPSI scores were higher for fingernails than toenails. In this study, they reported that nail psoriasis patients had a mean total NAPSI score was 30.12 ± 9.19 .⁷ The study by Velden et al. reported that the mean NAPSI score in 49 nail psoriasis patients was 26.6 ± 14.5 .⁸

Velden et al. reported the impact of nail psoriasis severity on patient quality

of life (QoL). A mean score for the social scale assessment was 75.1 ± 22.0 , the emotional scale was 78.8 ± 16.6 , and the symptom scale was 74.4 ± 21.0 . The QoL of nail psoriasis patients with fingernails and toenails appeared to be lower than nail psoriasis patients with fingernails involvement only. In women, the QoL is reported to be worse than in men.⁸ Another study by Ortonne et al. also reported significantly greater impaired QoL in women with nail psoriasis than in men, as measured by the Nail Psoriasis Quality of Life (NPQ10) questionnaire.^{8,9} Radtke et al. reported that patients with nail psoriasis had significantly lower mean QoL scores on the Dermatology Life Quality Index (DLQI) (7.2 vs. 5.3; $P < 0.001$).¹⁰ Nail psoriasis is a disease that can be highly visible, therefore, likely to affect QoL. However, the impact of this disease on QoL is still poorly explored.^{9,10} Based on the explanation above, it can be seen that nail psoriasis can affect the QoL of patients from various aspects of life, physically, psychologically, and psychosocial. However, we have not found a report regarding the severity of nail psoriasis on QoL in Indonesia. The study aimed to know the correlation between NAPSI score and QoL in nail psoriasis patients.

MATERIALS AND METHODS

Sample Selection

This cross-sectional study was conducted in the Polyclinic of the Immunodermatology Division in Dermatology and Venereology Department of Haji Adam Malik General Hospital Medan and Polyclinic Dermatology and Venereology of the Universitas Sumatera Utara Hospital Medan, and included a total sampling of 26 cases of nail psoriasis, involving psoriasis patients who have nail disorders with/without skin disorders. All samples were obtained by recording basic data and examining subjects, which included assessing nail psoriasis severity using NAPSI scores and an assessment of QoL using the NPQ10 questionnaire. The inclusion criteria in this study were nail psoriasis subjects aged ≥ 18 years who were willing to participate in the study and sign informed consent. Detailed clinical data were obtained by recording patient data,

consisting of sex, age, duration of psoriasis disease, NAPSI score, and NPQ10 score. The questionnaire involved the following validated questionnaires.

Nail Psoriasis Quality of Life (NPQ10)

NPQ10 is one of the instruments used to assess specific QoL in nail psoriasis.⁹ The process of selecting items resulted in 10 questions, with three responses possible for each one. The first question is concerned with the intensity of the pain of nail psoriasis; the other nine are linked to the functional impairment caused by nail psoriasis in daily life. The calculation of scores, the following rules were developed: each response is scored from 0 to 2, with the response 'no without hesitation' or 'not painful' scoring 0, the response 'yes, sometimes' or 'not very painful' scoring 1, and the response 'yes without hesitation' or 'very painful' scoring 2. The total score is obtained by adding the scores for the ten questions, ranging from 0 (no impairment on QoL) to 20 (maximum impairment).^{9,11,12} The questionnaire was designed and validated by Ortonne *et al.*⁹

The validity of the questionnaire has been carried out, in which the questionnaire has been translated into Indonesian, and all respondents understand what is written in Indonesian. Cronbach's (-coefficient measured internal consistency of the NPQ10. Coefficient scores > 0.707 usually indicate good internal reliability.

Nail Psoriasis Severity Index (NAPSI)

NAPSI is the first nail-specific scoring created for assessing the severity of nail involvement in psoriasis. NAPSI is a measuring instrument that was developed as an objective instrument and can produce the severity of nail matrix (pitting, leukonychia, red spot in lunula, crumbling) and nail bed (oil drop [salmon patch], onycholysis, subungual hyperkeratosis, splinter hemorrhages) psoriasis based on the interaction area in the nail anatomy. In this measurement, each nail quadrant is evaluated for the presence or absence of nail matrix and nail bed abnormalities.^{5,7,13}

The nail is divided with imaginary horizontal and longitudinal lines into quadrants. Each nail is given a score for nail bed psoriasis (0-4) and nail

matrix psoriasis (0-4) depending on the presence of any of the features of nail psoriasis in that quadrant.^{5,7} The score is 0 if the findings are not present, 1 if they are present in 1 quadrant of the nail, 2 if present in 2 quadrants of a nail, 3 if present in 3 quadrants of a nail, and 4 if present in 4 quadrants of a nail. Thus, each nail has a matrix score (0-4) and a nail bed score (0-4), and the total nail score is the sum of those 2 (0-8). The sum of the total score of all involved fingernails and toenails was the total NAPSI score for that patient at that time.^{5,14} The sum of the scores from all nails is 0-160. At any time, the matrix or the nail bed score can be assessed independently if desired.^{7,13,14}

Ethical Approval

The protocol of this study was approved by The Health Research, Ethical Committee, University of Sumatra Utara, Medan, Indonesia (No: 222/TGL/KEPK FK USU-RSUP HAM/2020).

Statistical Analysis

Statistical analysis was performed using the Pearson's correlation coefficients to assess significant correlations (the data had normal distribution). The p-values ≤ 0.05 were considered statistically significant.

RESULTS

Patient's characteristics

This study was included 26 cases of nail psoriasis, 15 patients (57.7%) were female, and 11 patients (42.3%) were male. The mean age of patients was 43.23 ± 15.95 years. Most patients were predominantly age group 48–57 years (34.6%). The duration of psoriasis diseases was predominant > 5 years (76.9%), with the mean duration of psoriasis, was 9.73 ± 5.59 years. The mean NAPSI score (fingernails and toenails) was 89.42 ± 32.01 , where 30.8% of patients had NAPSI score 81–100. The mean NPQ10 was 6.96 ± 3.30 . The characteristics of nail psoriasis in the study population are shown in Table 1.

NAPSI Score Based on Gender and Age

Based on gender, the mean NAPSI score in male patients was 101.72 ± 22.99 and in female patients was 80.40 ± 35.29 . The highest mean NAPSI score was in the age group of 48–57 years (110.11 ± 22.22). The

Table 1. Characteristics of the study population.

Variables	Number of cases (%)	Mean ± SD
Sex:		
Male	11 (42.3)	
Female	15 (57.7)	
Age group (years):		
18 – 27	6 (23.1)	43.23 ± 15.95
28 – 37	3 (11.5)	
38 – 47	4 (15.4)	
48 – 57	9 (34.6)	
> 57	4 (15.4)	
Duration of Psoriasis disease (years):		
0 – 1	2 (7.7)	9.73 ± 5.58
1 – 5	4 (15.4)	
> 5	20 (76.9)	
NAPSI score:		
1 – 20	1 (3.8)	89.42 ± 32.01
21 – 40	1 (3.8)	
41 – 60	3 (11.6)	
61 – 80	3 (11.6)	
81 – 100	8 (30.8)	
101 – 120	5 (19.2)	
> 120	5 (19.2)	
NPQ10 score:	26 (100)	

Table 2. The NAPSI score based on gender and age of the study population

Variables	Skor NAPSI Mean ± SD
Sex:	
Male	101.72 ± 22.99
Female	80.40 ± 35.29
Age group (years):	
18 – 27	74.67 ± 39.01
28 – 37	53.00 ± 25.34
38 – 47	95.75 ± 31.92
48 – 57	110.11 ± 22.22
> 57	86.00 ± 11.16

Table 3. Correlation between NAPSI score with NPQ10 score

Variable	p	r	r ²
VDR with PASI score	0.001	0.632	39%

NAPSI score based on gender and age in the study population is shown in [Table 2](#).

Correlation of NAPSI Score with Quality of Life

There was a significant moderate positive correlation between NAPSI score with NPQ10 score ($r = 0.632$, $p = 0.001$, $r^2 = 0.399$), shown in [Table 3](#). It showed that the higher the NAPSI score, the worse the QoL for nail psoriasis patients.

DISCUSSION

This present study reported 26 nail psoriasis patients, with the predominant proportion was female (57.7%) than male (42.3%). There was only one study conducted by Schons et al., which reported that the proportion of nail psoriasis patients was predominantly female (53.3%) than males (46.7%).¹⁵ Meanwhile, several studies reported conflicting results with the proportion of males with nail psoriasis ranged from 53-64% compared to females (35-46%).⁶⁻⁸ The difference in

the results of this study with most other studies can be influenced by the number of samples taken.

In this current study, the distribution of nail psoriasis was predominantly found in the 48-57 years age group (34.6%), with a mean age of 43.23 ± 15.95 . Similar results were reported by Ortonne et al., where the highest prevalence of nail psoriasis in the 54-64 years age group (26%), followed by the 40-53 years age group (25%), and ≤ 39 years age group (25%).⁹ The study by Prabhakar et al. reported the most distribution was 40 - 59 years age group (42.5%).¹⁶ The study by Kokolakis et al. also reported that the mean age of nail psoriasis patients was 47 ± 13.1 years.¹⁷ A study by Kyriakou et al. reported the mean age of nail psoriasis patients was 53.28 ± 14.8 .¹⁸ Meanwhile, Darjani et al. reported that the mean age of nail psoriasis patients was 39.8 ± 13.9 .¹⁹ In nail psoriasis, the age distribution affected the onset and severity of the disease. Several studies have reported slow onset (>40 years) in psoriasis patients who had nail involvement and its association with disease severity.^{16,20}

Based on disease duration, most patients in this current study had psoriasis for more than five years (76.9%), with the mean duration of nail psoriasis was 9.73 ± 5.59 . This result was in line with a study conducted by Ortonne et al. on the QoL of nail psoriasis patients, most of whom had psoriasis for >5 years (88.1%).⁹ The study conducted by Rajhasekar et al. reported that the mean duration of skin lesions was 7.32 ± 6.37 years.⁷ Choi et al. also reported that psoriasis' mean duration from 171 nail psoriasis patients was 9.5 ± 10.2 years.¹³ While a study conducted by Schons et al. reported a longer duration of disease where the mean duration of skin psoriasis that affected nails was 17.5 ± 10.7 years.¹⁵ And it is also supported by Velden et al. who reported that the mean duration of skin psoriasis of 49 nail psoriasis patients was 19 ± 13.6 years.⁸ Psoriasis vulgaris and psoriasis nails can be chronic and persistent with an unpredictable course of the disease. A lesion on the skin may initially precede nail psoriasis, but it is also possible that nail psoriasis will appear without being followed by a skin lesion.²¹ Studies have been conducted on psoriasis with nail involvement, increasing

the duration and extent of psoriasis.¹

The majority of patients in our study had a total NAPS score (fingernails and toenails) of 81-100 (30.8%), with the mean total NAPS score was 89.42±32.01. A similar result reported by Daulatabat et al., which reported a mean NAPS score of 83.20±40.10.²² A different result was reported by Rajashekar et al., where the majority of nail psoriasis patients had NAPS scores of 41-60 (30.8%), with the mean NAPS score was 30.41±29.19.⁷ Similarly, a study by Klaassen et al. also reported a mean NAPS score of 27.25±15.43.²³ The occurrence of nail psoriasis is the result of inflammation of the nail matrix and/or nail bed. The appearance of nail psoriasis can initially be preceded by a lesion on the skin that can cause damage to the nail, but sometimes nail psoriasis appears without being followed by a skin lesion.²¹ The severity of psoriasis is strongly influenced by various factors that can affect the patient's clinical improvement or worsening, such as genetics, environment, smoking, alcohol, metabolic syndrome, stress, and other comorbid.²⁴ So that the degree of severity of nail psoriasis in each individual can be different.

In this study, the mean total NAPS score of male nail psoriasis patients (101.72±22.99) was higher than that of women (80.40±35.29). This study was in line with the study by Kokolakis et al., which reported that male patients had more severe nail psoriasis than female patients (36.6 vs. 29.0; $p = 0.01$).¹⁷ A study conducted by Prabhakar et al. also reported a higher mean NAPS score for men (39.14±31.54) than women (10.97±16.74).¹⁶ There is no clear understanding of the factors that cause nail psoriasis severity higher in men. However, some studies report that the severity of nail involvement in psoriasis is related to the severity of skin manifestations, and this association is higher in males than in females.^{16,19,25,26}

The mean total NAPS score of nail psoriasis patients was also higher in the age group 48-57 years (110.11±22.22), and the lowest was the 28-37 years age group (53.00±25.34). The results of this study are in line with Prabhakar et al., who reported a higher mean total NAPS score

in patients with onset >40 years compared to <40 years (45±25.9 vs. 38.5±32.0; $p = 0.340$).¹⁶ Meanwhile, Marina et al. that the mean NAPS score in patients with onset <40 years was higher than >40 years but not significant (28.62±6.74 vs. 26.50±6.47; $p = 0.361$).²⁵ The severity of nail psoriasis is affected by several factors, such as the severity of skin psoriasis and the duration of the disease, so patients >40 years tend to have a more chronic psoriasis condition. There can be immune dysregulation and comorbid factors in adulthood and old age that will increase the severity of psoriasis. In certain age groups, especially adults, the presence of exogenous factors such as infection, trauma, smoking, and others can trigger symptoms and increase the severity of psoriasis on the skin and nails.^{16,25,27}

This study found that the QoL of nail psoriasis patients based on the mean NPQ10 score was 6.96±3.30. Reports regarding the mean NPQ10 score in nail psoriasis are mixed. A study by Klaassen et al. reported that the mean NPQ10 score was 9.9±14.0, where the mean nail psoriasis QoL score in males (7.5±12.2) was significantly lower than in women (12.6±15.5).¹¹ The study by Ortonne et al. investigating the development and validation of NPQ10 in 1309 nail psoriasis patients reported a mean NPQ10 score in male patients was 13.4 and female patients was 18.3.⁹ While another study by Klaassen et al. reported the low NPQ10 score in nail psoriasis (3.07±3.63).²³ A similar report was reported by Daulatabat et al. where the mean NPQ10 score in nail psoriasis patients was 1.1±0.4.²² A study by Dogra et al. reported that 93% of patients with nails psoriasis considered the condition to be a significant cosmetic defect, 60% interfering with their work and 52% described the pain as their main symptom.²¹ Similar study by Choi et al. reported that over 90% of patients with psoriasis and nail disorder worry about their nails' cosmetic appearance. Visibility of nail disorders can hinder social and business interactions and difficulties with daily living activities.¹³ The variety of results of the NPQ10 answers depends on the abnormalities and severity of fingernails and toenails. Moderate to severe psoriasis conditions, the incidence

of nail psoriasis is much greater with various nail disorders. Nail disorders can be given effective treatment to improve the quality of life of patients.^{28,29} Improving the quality of life of patients with nail psoriasis is as important as the success of the treatment given.

This study reported a significant moderate positive correlation between NAPS scores and NPQ10 ($r = 0.632$, $p = 0.001$), where the higher the NAPS score, the worse the quality of life for nail psoriasis patients. The result of this study is in line with the study by Kyriakou et al., which reported that the NPQ10 score was significantly associated with the NAPS score ($r = 0.851$, $p = 0.000$) and DLQI ($r = 0.479$, $p = 0.044$).¹⁸ A study conducted by Klaassen et al. reported an association between the NPQ10 score and the Self-Administered Psoriasis Area and Severity Index (SAPASI) score ($r = 0.209$, $p < 0.001$).¹¹ This indicates that the condition of nail psoriasis greatly affects the patient's quality of life psychosocially in daily life. The NPQ10 is the first and only measuring instrument to date to a specific focus on nail psoriasis. However, only a handful of studies have used this questionnaire.^{9,11}

The limitations of this study were no observation of nail psoriasis patients' QoL based on gender, amount of fingernails and toenails involvement, PASI score, and excluded other exogenous factors (such as infection, trauma, and smoking) that could increase the severity of psoriasis on the nails. Thus, additional studies are needed to further investigate the quality of life in nail psoriasis patients.

CONCLUSION

We observed psoriasis patients who have nail disorders with/without skin disorders. The NAPS score and the QoL showed a significant moderate positive correlation. These results indicated that the severity of nail psoriasis interfered with the QoL in nail psoriasis patients.

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CONFLICT OF INTEREST

The authors declare that no conflict of interest in this study.

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AUTHOR CONTRIBUTION

All authors equally contributed to the study from the study framework, data gathering, and data analysis until reporting the result of the study.

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