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NAIL PSORIASIS QUALITY OF LIFE SCALE 10 (NPQ10) AS A PREDICTOR OF QUALITY OF LIFE IN NAIL PSORIASIS PATIENTS

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Abstract: Nail psoriasis can affect the patient's quality of life, so to evaluate the quality of life in patients with skin diseases in general, the Dermatology Quality of Life Index (DLQI) can be used. The questionnaire was unable to distinguish the impact on quality of life caused by nail abnormalities or skin lesions, so a special scoring system was needed to evaluate the quality of life for nail psoriasis patients with the Nail Psoriasis Quality of Life Scale 10 (NPQ10). To find the relationship between the severity of nail posirais based on Nail Psoriasis Severity Index (NAPSI) score with DLQI and NPQ10. The total respondents were 20 people with a diagnosis of nail psoriasis who came to the Dermatovenereology Outpatient Clinic of Dr. Moewardi General Hospital, Surakarta from April-June 2020. We took photography and dermoscopy of fingernails and toes and then calculated the NAPSI score. All respondents filled out the DLQI and NPQ10 questionnaires. Pearson's (r) correlation test was used to find the relationship between the mean and standard deviations of NAPSI and DLQI and NPQ10. We also tested the correlation between DLQI and NPQ10. The data significance value was declared significant if $p < 0.05$. The results of the correlation test between NAPSI scores with DLQI and NPQ10 showed a statistical relationship, where the correlation value between NAPSI and DLQI was slightly more significant than NPQ10 ($r = 0.948$: $r = 0.877$; $p < 0.05$). The mean value of DLQI and NPQ10 in women was higher than men (14.12 ± 8.21: 11.5 ± 8.29 and 11.5 ± 3.58: 8.16 ± 4.52) with a correlation test value of DLQI and NPQ10 is $r = 0.888$, $p < 0.05$. We found that the association between NAPSI correlates more significantly with DLQI than NPQ10. This may be due to some questions that do not reflect the daily activities of our study subjects, but NPQ10 score in women is higher than men where the quality of life for nail psoriasis is also influenced by gender.

Keywords: DLQI; nail psoriasis; NAPSI; NPQ10; quality of life.

INTRODUCTION

Psoriasis is a chronic inflammatory skin disease mediated by an immunological process, where there can be disorders of the skin and nails. Nail abnormalities in psoriasis patients are mostly asymptomatic and are an early marker of the course of the disease (Gudjonsson JE, 2012). Nail psoriasis can occur in 50-79% of patients and more than 87% of cases are found in arthritis psoriasis. Hoof psoriasis often causes physiological and cosmetic disorders, which can lead to disruptions in the patient's quality of life (Bardazzi et al., 2017).

Psoriasis of the nails can occur on the nail matrix, nail pads, proximal nail folds or hyponychium. Clinical manifestations that can be found are nail pitting, discoloration, onycholysis, subungual hyperkeratosis, onychodistrophy, splinter hemorrhage, leukonikia, red spots on the lunula, and wavy nail plates.3 The severity of nail psoriasis can be determined based on the scores of the Nail Psoriasis Severity Index (NAPSI) first discovered by (Rich & Scher, 2003) in Colombia. The score calculation by dividing one nail unit into four quadrants was then seen structural abnormalities in the nail matrix and nail plate.

Research conducted by de Jong, et al in the Netherlands in 1996 reported that in 35.4% of patients with nail psoriasis who received therapy, as many as 45.7% did not make clinical improvements and caused disturbances in the quality of life (de Jong et al., 1996). Krisnarto, et al reported the prevalence of nail psoriasis at Semarang Hospital in 2015 of 2.5% of 40 patients with psoriasis vulgaris (Krisnarto E, 2016). Nail psoriasis can affect the quality of life of patients, So a specific questionnaire is needed. (Ortonne et al., 2010) in Europe proposed a special assessment system in the form of Nail Psoriasis Quality of Life Scale 10 (NPQ10) consisting of 10 questions with a total score of 20. (Klaassen et al., 2014) conducted a study in the Netherlands in 2014 to compare the severity of psoriasis using the Self-Administered Psoriasis Area and Severity Index (SAPASI) score against nail quality using the NPQ10 score reporting that the SAPASI score correlates with NPQ10. Based on these descriptions, the purpose of our study was to determine the relationship between the severity of nail psoriasis measured using a NAPSI score on the quality of life of patients using DLQI and NPQ10 scores.

MATERIALS AND METHODS

This type of research is an observational analysis conducted at the Skin and Venereal Polyclinic of Dr. Moewardi Surakarta Hospital during the period from April to June 2020. The subjects of the study numbered 20 people (12 men and 8 women) based on a total sample of new patients with a diagnosis of nail psoriasis. The age range of the study subjects was between 17-61 years, based on the age of the respondents who came for treatment. The research inclusion criteria include patients with a diagnosis of nail psoriasis, aged more than 16 years,

willing to take clinical photos and dermoscopy examinations on the fingernails and toe, and sign a medical procedure approval sheet. The exclusion criteria for this study include patients with onychomycosis, psoriatic erythroderma and arthritis psoriasis.

All subjects of the study took clinical photographs of nails using the Canon® EOS 800D camera, and then we performed a nail dermoscopy examination using the Heine Delta 20T® dermatoscopy device. Nail dermoscopy examination is carried out in two ways, namely dry technique (without using immersion oil) and wet technique (using immersion oil). The severity of psoriasis nails was calculated based on the NAPSI score from the results of physical examination and dermoscopy (Appendix 1), while to evaluate the quality of life of patients we used a DLQI score consisting of 10 questions (Appendix 2). We also conducted a more specific assessment of the quality of life of nail psoriasis patients using an NPQ10 score consisting of 10 questions (Appendix 3).

The collected data was then analyzed stastistically using the Shapiro-Wilk test to determine the consistency of data distribution. Descriptive statistical analysis was carried out for several variables including gender, age and nail structure abnormalities based on the results of clinical examinations and dermoscopy. The Pearson correlation test (r) was used to find the relationship between the mean and default values of NAPSI with DLQI and NPQ10 and the correlation between DQLI and NPQ10. Data were analyzed using SPSS version 21 (IBM, Chicago, IL, USA) with a signification value of $p<0.05$.

RESULTS AND DISCUSSION

Based on the characteristic data of the study subjects (Table 1), the highest number of nail psoriasis patients was men as many as 12 patients (60%) with the most frequent age group between 36-45 years as many as 6 patients (30%). The most common nail psoriasis disorder found based on the results of clinical examination and dermoscopy is *splinter haemorrhage* (80%).

The mean value and standard deviation of the NAPSI scores of all study subjects were 25.85 ± 14.86, while the average values and interchanges of DLQI and NPQ10 standards were 12.55 ± 8.15 and 9.5 ± 4.40.

The results of the correlation test between the NAPSI score with DLQI and NPQ10 showed a statistical relationship, where the correlation value between NAPSI and DLQI was slightly more significant compared to NPQ10 ($r=0.948$: $r=0.877$; $p<0.05$) (Table 2).

Based on gender, the average value of DLQI and NPQ10 in women was higher than that of men (14.12 ± 8.21: 11.5 ± 8.29 and 11.5 ± 3.58 : 8.16 ± 4.52), while the results of the correlation test between DLQI and NPQ10 overall of the study subjects showed values of $r=0.888$, $p<0.05$ (Table 3).

Table 1. Characteristics of the subject of study.

Variable	Sum	Percentage (%)
Gender		
Man	12	60
Woman	8	30
Age		
15-25 years	5	25
26-35 years	1	5
36-45 years	6	30
46-55 years	5	25
56-65 years	3	15
Dermoscopy overview		
Splinter haemorrgahe	16	80
Nail pitting	15	75
Corrugated nails	14	70
Subungual 591yperkeratosis	14	70
Onikolisis	6	30
Oil drop	4	20

Table 2. The relationship between the severity of the nail and the quality of life in nail psoriasis patients.

Variable	DLQI (12,55 ± 8,15)	NPQ10 (9,5 ± 4,40)
NAPSI (25,85 ± 14,86)	r=0,948*	r=0,877*

DLQI (*Dermatology Life of Quality Inderx*), NAPSI (*Nail Area Psoriais Index*), NPQ10 (*Nail Psoriasis Quality of Life 10*)

*Berkorelasi secara signifikan jika nilai p<0,05.

Table 3. The relationship between sex and quality of life in nail psoriasis patients.

Variable	DLQI	NPQ10	Correlation Test (r)
Man	11,5 ± 8,29	8,16 ± 4,52	
Woman	14,12 ± 8,21	11,5 ± 3,58	r=0,888*

DLQI (*Dermatology Life of Quality Inderx*), NPQ10 (*Nail Psoriasis Quality of Life 10*) *Berkorelasi secara signifikan jika nilai p<0,05.

Discussion

Psoriasis is a chronic inflammatory skin disease caused by disorders of the immune system with multifactorial etiologies such as the involvement of genetic and environmental factors. The prevalence of psoriasis worldwide is estimated at 1-3%, where in 80-90% of cases nail abnormalities are obtained. [1] Research conducted by Augustin, et al in Germany in 2010 reported that the incidence of nail psoriasis was more prevalent in men by 11.2% (Augustin et al., 2010). Data from the *World Health Organization* (WHO) in 2016 reported that the incidence of psoriasis is more prevalent in adults between the ages of 30-50 years (3.10%) especially in some developed countries such as the United States and the United Kingdom (Michalek et al., 2017).

Data on the characteristics of the subjects of this study showed that the incidence of nail psoriasis was more prevalent in men by 80%. Research by Rinandari and Kusumawardani in 2019 2018 at the Skin and Venereal Polyclinic of Dr. Moewardi Surakarta Hospital stated that the incidence of nail psoriasis is more prevalent in men than women (65% : 35%). (Rinandari U, 2018). Research by Cemil, et al in Turkey in 2015 stated that testosterone levels in men with psoriasis were lower than in healthy individual controls, while the hormone estrogen in women functioned to inhibit inflammatory processes and immunological activity in prosiasis (Cemil et al., 2015). The prevalence of nail psoriasis in this study occurred mostly in the age range of 36-45 years, which was 30%. Research conducted by Icen, et al in 2009 in the United States reported that the incidence of psoriasis is more prevalent in the age group of 30-50 years which can be influenced by several precipitating factors both endogenous (hormonal, psychological stress, allergies) and exogenous (trauma, drugs, smoking, alcohol consumption) (Icen et al., 2009).

The clinical manifestations of nail psoriasis vary depending on the part of the nail that has an abnormality, there can be disturbances in the nail matrix, nail pads, proximal nail folds or hyponicium (Tham et al., 1988). Salomon, et al in 2003 in Paris reported that nail psoriasis images of subungual hyperkeratosis, onychorhexis and discoloration of the nail plate are more common in toenails, while nail *pitting* and *splinter haemorrhage* are more commonly found in fingernails (Salomon et al., 2003). The most images of nail psoriasis dermoscopy in our study were *splinter haemorrhage* of 80 %, where the results were the same as the study conducted by Yorulmaz and Artuz in Tukri in 2017 reported that the most images of nail psoriasis dermoscopy were *splinter hemorrhages* by 80% (Yorulmaz & Artuz, 2017). *Splinter hemorrhage* occurs due to damage to the dermis capillaries which causes erythrocyte extravasation and

accumulates between the gaps of the nail plate and the nail pads, thus forming a longitudinal line especially on the distal part of the nail and is brownish-red or purplish-black (Harwood et al., 2016; Parija et al., 2016).

A meta-analysis study conducted by Stewart, et al in 2020 in the United States reported that the severity of nail psoriasis evaluated using NAPSI scores was significantly associated with DLQI (Stewart et al., 2021) The results of the *Pearson* correlation test between NAPSI and DLQI scores in our study showed a very strong association with values r=0.948, p<0.05. A meta-analysis study conducted by Reich and (Stewart et al., 2021) in Poland reported a link between DLQI and NAPSI as well as worsening of *Health-related Quality of Life* (HR-QoL) in nail psoriasis patients. 19 Augustin, et al also reported that in one year in psoriasis patients with nail involvement more did not come to work than without nail involvement (9.8 ± 42.0: 3.3 ± 15.9 days, p<0.001), so as to affect the socioeconomic status as well as the HR-QoL of the patient.

The use of DLQI in psoriasis patients with complaints of skin and nail lesions cannot distinguish the quality of life impact caused by one or both. This sparked the idea of creating a special assessment system to evaluate quality of life in nail psoriasis patients proposed by Ortonne, et al in 2009 in European and known as NPQ10. The questionnaire consists of 10 questions to determine the influence of physical activity related to nail psoriasis, other precipitating factors involved or both. The first question relates to the intensity of pain caused by nail psoriasis, while the other nine questions are related to functional disorders caused by lesions of the nails. There are three possible answers to each question with a value of 0 to 2, then a summation is carried out with a minimum value range of 0 (no disturbance in quality of life) and a maximum value of 20 (severe degree of quality of life disorder) (Ortonne et al., 2010)

The NPQ10 questionnaire is the first and latest assessment system to determine the quality of life in patients with nail psoriasis, so there is still little research to use it and currently, it is still limited in use in France. The results of a study from (Klaassen et al., 2014) in the Netherlands reported that the severity of psoriasis measured using SAPASI was statistically correlated with NPQ10 (r=0.389; p<0.001). Based on the study, it is similar to the results of our study where the NAPSI score value correlates very strongly with NPQ10 (r=0.877, p<0.05). We also compared the relationship between NAPSI scores with DLQI and NPQ10, where NAPSI scores correlated slightly more significantly to DLQI compared to NPQ10 (r=0.948: r=0.877, p<0.05). To date, there has been no research comparing the relationship between NAPSI scores with DLQI and NPQ10, so we have not been able to compare with other studies. We concluded that there was a question on NPQ10 in the form of interference when driving a car due to nail psoriasis, where all respondents did not drive a car so that the results of the NAPSI correlation test to NPQ10 were slightly lower compared to DLQI.

The quality of life of nail psoriasis patients can also be influenced by gender,

where women with nail psoriasis are more likely to complain about their physical appearance which has an impact on the socioeconomic factors of the patient. Research by Augustin, et al in 2014 in Germany reported that women with nail psoriasis were more often absent from work compared to men (8.5 ± 32.1: 6.0 ± 21.9), where nail psoriasis in women had more impact on HR-QoL compared to men (9.5 ± 7.1: 8.6 ± 7.1). The results of the study are the same as ours where the value of DLQI and NPQ10 in women with nail psoriasis is higher than that of men (14.12 ± 8.21: 11.5 ± 8.29 and 11.5 ± 3.58: 8.16 ± 4.52). Research conducted by Gregoriou and Rigopoulosa in 2010 in Europe stated that women with psoriasis skin and nail lesions pay more attention to the condition and development of the disease, so it will have an impact on the patient's social relationship with the surrounding environment as well as limitations to carry out daily activities (Gregoriou S, 2014).

The NPQ10 questionnaire was developed specifically to assess the quality of life of nail psoriasis patients by listing some questions not found in DLQI. Research conducted by (Klaassen et al., 2014) in the Netherlands in 2014 reported that nail psoriasis patients more often had difficulty wearing shoes or socks (21.2% and 25.1%) as well as disturbances when carrying out activities inside the home (25.3%). Based on the results of the study, the questions listed on NPQ10 are more specific to evaluate the impact of nail psoriasis on daily activities as well as the patient's HR-QoL. [8] Research conducted by Ortonne, et al in 2009 in Europe reported significant validation test results between DLQI and NPQ10 namely $r=0.48$, $p<0.05$, where these results were the same as ours where the correlation test results between DLQI and NPQ10 showed a very strong relationship ($r=0.888$, $p<0.05$). [20] NPQ10 scores are significant enough to evaluate HR-QoL, especially in nail psoriasis patients, so that efforts to treat and prevent recurrence in psoriasis patients can be achieved better.

The limitations of this study include the small number of study subjects due to the coronavirus pandemic so that patients who come for treatment decreases. We hope that in the future further research can be carried out with a larger number of samples, so that it can be used as a guide to evaluating the quality of life of nail psoriasis patients, helping to achieve clinical improvement and preventing recurrence.

CONCLUSIONS

Nail psoriasis often gives rise to physiological and cosmetic disorders, so it can affect the patient's quality of life. The use of DLQI in psoriasis patients with complaints of skin and nail lesions could not distinguish the impact of HR-QoL caused by nail abnormalities or skin lesions, so a more specific NPQ10 score was used to evaluate the impact of nail psoriasis on quality of life. Our results showed an association between the severity of nail psoriasis based on NAPSI scores correlated more significantly to DLQI than NPQ10. The difference in values was caused by several questions in NPQ10 that were less relevant to the daily activities of the subjects of this

study. NPQ10 values in women are higher than in men, which indicates that the quality of life of patients with nail psoriasis is also influenced by gender.

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