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Quality of life in onychomycosis patients at H. Adam Malik General Hospital, Medan - Indonesia, 2016



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Gustina Putri,^{1*} Isma Aprita Lubis,^{2*} Imam Budi Putra³

ABSTRACT

Background: Onychomycosis describes fungal infection of the nail caused by dermatophytes, non-dermatophytes molds, or yeast. It affects up to 14% of the population worldwide. Although onychomycosis is not a life-threatening condition, the disease does not only appear to be a cosmetic problem, it has been suggested that patient can experience deleterious psychologic effects. Onychomycosis has the psychological, psychosocial, and emotional impact that reduce patient's quality of life.

Objective: To determine the quality of life in onychomycosis patients.

Subject and methods: This research was a descriptive study with a cross-sectional design involving 43 onychomycosis patients. The diagnosis of onychomycosis was confirmed by physical examination and fungal culture. Each subject answered *NailQoL* questionnaires and the results were assessed. Value with a higher score shows the lower quality of life.

Result: Quality of life in the most onychomycosis patients was the lower quality of life with the value of *NailQoL* in the number of ≥ 37 (41,9%). Based on the gender, the female had the lower quality of life (41,9%). Based on the age, patients in 30-39 years old group had the lower quality of life (62,5%). Based on the education level, patients who went to university had lower quality of life (50,0%). Based on patient's occupation, the student has the lower quality of life (100%). Based on the duration of illness, patients with more than 10 years duration of illness had a lower quality of life (60,0%). Based on the number of nail involvement, patients with 11-15 nails and 16-20 nails involvement had the lower quality of life (100%).

Conclusion: Quality of life in the most of onychomycosis patients was the lower quality of life. The lower quality of life was more common in female patients, patients in 30-39 years old group, university education level, students, > 10 years duration of illness, 11-15 and 16-20 number of nails involvement.

Pre-graduate of Departement of Dermatology and Venereology Faculty of Medicine, University of Sumatera Utara, Indonesia
dr.Pirngadi General Hospital Medan, Indonesia

Departement of Dermatology and Venereology Faculty of Medicine, University of Sumatera Utara, Adam Malik General Hospital, University of Sumatera Utara General Hospital, Medan, Indonesia

*Correspondence to:

Gustina Putri, Isma Aprita Lubis, Pre-graduate of Departement of Dermatology and Venereology Faculty of Medicine, University of Sumatera Utara, Indonesia
dr.Pirngadi General Hospital Medan, Indonesia Departement of Dermatology and Venereology Faculty of Medicine, University of Sumatera Utara, Adam Malik General Hospital, University of Sumatera Utara General Hospital, Medan, Indonesia
utputri@gmail.com
imam_65@yahoo.com

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INTRODUCTION

Onychomycosis is a fungal infection of nails which is caused by dermatophytes, non-dermatophytes, or yeast. Based on the clinical manifestation, onychomycosis is classified into distal lateral subungual onychomycosis, proximal subungual onychomycosis, and white superficial onychomycosis.^{1,2,3}

Onychomycosis affects 14% of the total world population.⁴ This disease is affected by several predisposition factors, one of which is older patients.^{1,2} The prevalence of onychomycosis in 2009 was 0.9% from 3,450 patients who came to Department of Dermatovenereology in H. Adam Malik Hospital in Medan.⁵

In most of the cases, onychomycosis was caused by dermatophyte and *Trichophyton rubrum* was found in 90% of the cases.¹ Non-dermatophytes/mold such as *Acremonium*, *Aspergillus*, *Fusarium* was found in 10% of the toenails onychomycosis, while the most common yeast which caused onychomycosis was *Candida albicans*.^{1,4,6}

Onychomycosis had a significant effect on an individual.^{7,8} This condition was correlated with pain and discomfort. In addition, cosmetic problem

and psychosocial effect could affect patients with onychomycosis.⁷⁻⁹

Although onychomycosis is not life-threatening, this disease is not only a cosmetic problem.⁷ When nails are infected, patients will feel pain and discomfort.⁸ Toenails dystrophy will cause a disturbance when standing, walking, having physical exercise, or when wearing footwear. In the other hand, fingernails infection will limit the daily life activities.^{9,10} In addition to the physical factor, onychomycosis also plays role in patients quality of life socially, psychologically, and emotionally.⁷⁻¹⁰

Quality of life is an important health issue.¹¹ Quality of life is defined as cognitive awareness of individual satisfaction of life. World Health Organization defined quality of life as individual perception of their position in life and its relation with goals, expectations, standards, concerns, and its impact on physical health, mental health, and social relationship.^{11,12}

Health-related quality of life (HRQL) described the patients' evaluation of the disease impact and medication to physical, psychology, and social

Table 1 Quality of life categories in onychomycosis patient

<i>NailQoL</i>	N	%
Score categories		
< 5 (very high)	0	0
6-17 (high)	12	27,9
18-36 (moderate)	13	30,2
> 37 (lower)	18	41,9

Table 2 The characteristics and distribution of quality of life in onychomycosis patient

	Patient characteristic		Quality of life categories				
	n	%	Very high (%)	High (%)	Moderate (%)	Lower (%)	Total (%)
Gender							
Male	12	27,9	0	4(33,3)	3(25,0)	5(41,7)	12(100)
Female	31	72,1	0	8(25,8)	10(32,3)	13(41,9)	31(100)
Age							
20-29 years old	5	11,6	0	1(20,0)	1(20,0)	3(60,0)	5(100)
30-39 years old	8	18,6	0	1(12,5)	2(25,0)	5(62,5)	8(100)
40-49 years old	9	20,9	0	2(22,2)	3(33,3)	4(44,4)	9(100)
50-59 years old	16	37,2	0	6(37,5)	5(31,3)	5(31,3)	16(100)
60-70 years old	5	11,6	0	2(40,0)	2(40,0)	1(20,0)	5(100)
Education level							
Elementary school	3	7,0	0	1(33,3)	1(33,3)	1(33,3)	3(100)
Junior high school	15	34,9	0	3(20,0)	6(40,0)	6(40,0)	15(100)
Senior high school	13	30,2	0	5(38,5)	3(23,1)	5(38,5)	13(100)
University	12	27,9	0	3(25,0)	3(25,0)	6(50,0)	12(100)
Occupation							
Housewife	11	25,6	0	3(27,3)	5(45,5)	3(27,3)	11(100)
Government employees	4	9,3	0	1(25,0)	2(50,0)	1(25,0)	4(100)
Farmer	9	20,9	0	4(44,4)	1(11,1)	4(44,4)	9(100)
Household assistant	8	18,6	0	1(12,5)	3(37,5)	4(50,0)	8(100)
Private employees	7	16,3	0	1(14,3)	1(14,3)	5(71,4)	7(100)
Unemployment	3	7,0	0	2(66,7)	1(33,3)	0(0,0)	3(100)
Student	1	2,3	0	0	0	1(100)	1(100)
Duration of illness							
years	26	60,5	0	9(34,6)	9(34,6)	8(30,8)	26(100)
6-10 years	12	27,9	0	1(8,3)	4(33,3)	7(58,3)	12(100)
> 10 years	5	11,6	0	2(40,0)	0(0)	3(60,0)	5(100)
The number of nail involvement							
1-5 nails	29	67,4	0	9(31,0)	11(37,9)	9(31,0)	29(100)
6-10 nails	12	27,9	0	3(25,0)	2(16,7)	7(58,3)	12(100)
11-15 nails	1	2,3	0	0(0,0)	0(0,0)	1(100)	1(100)
16-20 nails	1	2,3	0	0(0,0)	0(0,0)	1(100)	1(100)

function.¹¹ HRQL was affected by disease or treatment and showed how those things could affect individual function and perception on their health.^{11,12,13}

Nail Quality of Life Questionnaire (NailQoL) was a specific instrument to assess the quality of life in patients with onychomycosis. It was first introduced by Warshaw et al in 2007. This questionnaire as shown to be validated, reliable, and responsive instrument in measuring perceived QOL for patient with onychomycosis. *NailQoL* produced 15 items consisted of three scale which were symptom, emotional, and functional scale. This instrument included 3 items for symptom domain, 10 items for emotional domain, and 2 items for functional domain.¹⁴ Several studies showed that onychomycosis affected patient quality of life especially physically, socially, and emotionally.¹⁵⁻¹⁷

METHODS

This was a descriptive study with a *cross-sectional* design. This study was conducted from March to October 2016. The target population was the onychomycosis patients who came to H. Adam Malik General Hospital in Medan. The sample selection used the consecutive sampling methods. The data included subject identity, history taking, physical examination, and dermatology examination. Inclusion criteria were as follow; onychomycosis patient that diagnosed based on dermatology examination and confirmed by fungal culture from the infected nails, 20-70 years old, and capable of reading and writing. Exclusion criteria were as follow; onychomycosis patient concomitant with lichen planus and nail psoriasis patient. All subjects who had fulfilled the inclusion and exclusion criteria signed the informed consent and filled the questionnaire, assisted by the researchers to assess the quality of life-based on *NailQoL*. *NailQoL* consisted of 15 questions which were divided into 3 major criteria, which were symptom, function, and emotion. The quality of life of onychomycosis patient was based on the mean value of the 15 questions then categorized based on mixture analysis, including very high (< 5), high (6-17), moderate (18-36), low (≥ 37).¹⁸ All data recorded were then assisted and presented as descriptive data.

RESULT

Fourty-three patients participated in this study. Based on the patient characteristic, in this study from 43 subjects, 31(72,1%) patient was female, and 12(27,9%) was male. The majority subject was patient

with 50-59 years old 16(37,2%), patient with junior education level 15(34,9%), the housewife 11(25,6%) 1-5 years duration of illness 26(60,5%), and 6-10 number nail involvement 29(67,4%) (table 2).

The quality of life in onychomycosis patients showed that the most of patients had a lower quality of life 18(41,9%), followed by moderate quality of life 13(30,2%), and high quality of life 12(27,9%) (table 1). Based on the gender, the female had the lower quality of life (41,9%). Based on the age, patients in 30-39 years old group had the lower quality of life (62,5%). Based on the education level, patients who went to university had the lower quality of life (50,0%). Based on patient's occupation, students had the lower quality of life (100%). Based on the duration of illness, patients with more than 10 years duration of illness had the lower quality of life (60,0%). Based on the number of nail involvement, patients with 11-15 nails and 16-20 nails involvement had the lower quality of life (100%). (table 2).

DISCUSSION

The quality of life measurement was an important health issue. In dermatology, HRQL could be assessed by using generic instrument and specific instrument.¹⁹ Onychomycosis is the most common nails disease.^{1,3} Although the disruption in nails does not usually correlate with physical morbidity and is not life-threatening, this disease is difficult to overcome, so it can cause psychological impact to both patients and physicians.²⁰

In this study we found that the most of patients had a lower quality of life, followed by moderate quality of life, and high quality of life. This study was consistent with the study by Drake and Szepletowski which found that there was a decrease in the quality of life in patients with onychomycosis. It could be concluded that onychomycosis caused impairment in both psychological and social life of the patients.^{8,20} Study by Szepletowski showed that onychomycosis had negative impact in patients' quality of life. Patients complained of embarrassment related with their nails condition and were afraid that they will transmit the disease to the others.⁸ Study by Drake *et al* found that embarrassment (74%), difficulty in cutting nails (76%), and discomfort (38%) were found in patients with onychomycosis. Stigma which was related with onychomycosis also caused emotional stress and low self-esteem.²⁰

The result of this study showed that females patient more common had the lower quality of life compared to males. Study by Drake *et al* showed

that the impact onychomycosis depended on the gender and this study found that onychomycosis caused embarrassment in females (83%) compared to males (71%).²¹ The same result was found by Szepietowski *et al* and Scher *et al* who found that onychomycosis had more social and emotional impact on females than males. The explanation was that female was more sensitive to physical perception and was more sensitive to pain.^{8,22}

This study showed that 30-39 years old group patient more common had the lower quality of life. Study by Szepietowski *et al* showed that younger patient had lower quality of life score compared to older patients.⁸ The similar result was showed by Lubeck *et al* who stated that patients with onychomycosis who were more than 65 years old had higher quality of life compared to younger patients. The study indicated that onychomycosis had less impact to quality of life in older patients.²³

Several studies showed that younger patients were more active socially, therefore younger patients tended to seek for treatment to cure their nails condition. While older patients were more focused on the symptoms such as pain and assumed that this disease was difficult to cure and would stay in their whole life.^{7,23}

In this study found that patients with university education level are more common had lower quality of life compared to the other education level. Study by Szepietowski *et al* showed that patients with onychomycosis who went to university had lower quality of life (62.5 ± 27.5) compared to lower education level.¹⁰

Education level played role in psychosocial impact in onychomycosis. Patients with higher education and resided in urban area had lower quality of life compared to patients who resided in rural area and had lower education level, despite the milder form of the clinical manifestation of the disease. This was caused by patients with higher education level were more active socially and had more contacts with others compared to patients with lower education level.⁷

This study showed that based on patient's occupation, student are more common had the lower quality of life. Drake *et al* reported that the disease affected patients' social and professional lives and that it kept them from participating in leisure activities or because of embarrassment. Although the impact on the ability to perform work-related activities was small, 25% of participants indicated the disease interfered with their professional relationships. Forty percent of those surveyed also experienced problems with social relationship.²⁴

This study showed that onychomycosis patient with more than 10 years disease duration

are more common had the lower quality of life compared to shorter disease duration. A study by Elewski *et al* showed that patients with more than 10 years disease duration had a worse psychosocial impact compared to patients with shorter disease duration.¹⁷ This was contrary to study by Milobratovic *et al* stated that patients with disease duration less than 2 years were reported to have a lower quality of life compared to patients with more than 5 years disease duration. This was expected since patients had started to adapt to their disease.²⁵

This study found that patients with 11-15 and 16-20 number of nails involved are more common had lower quality of life compared to patients with less number of nails involved. A study by Drake *et al* showed that the quality of life in patients with onychomycosis was affected by the nails involvement, which was an area of nails involved, the involvement of half or whole nails, and number of nails involved. Patients with onychomycosis who had more than 5 nails involved had lower quality of life compared to 1-2 nails involved.^{20,21}

A study by Szepietowski *et al* found that patients with onychomycosis with more than 2 nails involved complained that others were more concerned with their nails condition compared to patients with 1-2 nails involved. In addition, patients with more than 5 nails involvement complained that they were more discomfort with their nails condition compared to patients with 1-2 nails involved.⁸

The same result was found by Drake *et al* which showed that patients with onychomycosis with the whole toenails involved were significantly more affected emotionally, socially, and physically compared to patients with less number of nails involved. Several studies indicated that worse clinical manifestation was showed by patients with more number of nails involved.²¹

This study had some limitation such as we do not differentiate onychomycosis on fingernail and toenail, it would be better that in the future study, quality of life in onychomycosis patients are measured by distinguishing between the quality of life of onychomycosis patients on fingernail and toenail.

CONCLUSION

Based on the assessment using NailQoL questionnaire, quality of life in the most of onychomycosis patients was the lower quality of life. The lower quality of life was more common in female patients, patients in 30-39 years old group, university education level, patients' who was a student, more than 10 years duration of illness, 11-15 and 16-20 number of nails involvement.

CONFLICT OF INTEREST

The authors declared that they have no conflicts of interest.

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