

The Impact of Onychopathies on Quality of Life: A Hospital-based, Cross-sectional Study

Abstract

Background: Onychopathies or nail disorders are associated with social stigma and causes limitation of daily activities by hampering the function of both fingers and toes. **Aim:** To evaluate the impact of onychopathies on quality of life (QoL) and compare the severity of impact on QoL in various nail disorders. **Materials and Methods:** A hospital-based cross-sectional study consisting of 540 patients with onychopathies was conducted in the dermatology outpatient department. Patients were requested to complete a nail-specific QoL questionnaire consisting of 24 and 16 questions, respectively, for fingernails (group F) and toenails (group T) with five possible responses to each question. A score of 1-5 was given to each response. Statistical analysis was done to compare the impact of QoL on the different types of onychopathies. **Results:** We found that onychopathies have a significant impact on QoL. QoL was significantly more affected when multiple nails were involved ($P = 0.020$ for group F and $P = 0.001$ for group T). QoL impact was statistically more significant in women ($P = 0.038$ for group F and $P < 0.001$ for group T) and in younger people aged <20 years in group F and 20-39 years in group T ($P < 0.001$ for both groups F and T). Patients with onychomycosis, structural nail defects, and psoriasis had a more significant impact than other diseases ($P < 0.001$ for both groups F and T). **Conclusion:** Onychopathies have a significant adverse effect on QoL because of their serious physical, psychological and social impact. Hence, clinicians should treat the nail disorders with utmost seriousness.

Keywords: Nail psoriasis, onychomycosis, onychopathies, paronychia, quality of life

Introduction

Nails are important organs of our body and serve structural, functional and cosmetical roles. They provide protection to the digital tips, increase tactile sensitivity, help in picking up small objects, enable scratching, and act as a weapon of self-defence and cosmetic accessory. Healthy-looking nails play an important role in an individual's body image and thus affect interpersonal relationships.^[1] Onychopathies or nail disorders accounts for 10% of all dermatological conditions. They are associated with social stigma, cosmetic disfigurement, functional impairment and financial burden.^[2,3] The functional impairment due to onychopathies can disrupt the routine activities, such as walking, standing or writing. They can have disastrous effects on the physical, psychological and social aspects of patient's life and can result in embarrassment, reduced self-esteem,

depression and social isolation. Despite this, many onychopathies are just perceived as cosmetic nuisance and not considered serious. Although there is an adequate research on the impact of dermatological disorders on quality of life (QoL), research on the impact of onychopathies is still limited. This study was performed to evaluate the impact of nails diseases on QoL in North Indian population.

Materials and Methods

This was a hospital-based cross-sectional descriptive study conducted in the Outpatient Department of Dermatology from July 2017 to June 2018. The study was approved by the Institutional Ethics Committee.

All patients with onychopathies attending the OPD during the study period, who satisfied the following criteria, were enrolled in the study: age above 14 years, patients without mental impairment.

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Patients who had only toenails involvement were included in group T while those patients who had involvement of fingernails with or without toenails were included in group F. A total of 540 patients with nail disorders were recruited: 258 patients in group F and 282 in group T.

Patients were requested to complete the international onychomycosis-specific QoL questionnaire as designed by Drake *et al.*^[4] [Annexure 1] which was also modified in the local language understandable to the patient. This questionnaire was chosen to assess QoL impact as questions used in this questionnaire were not limited to clinical features of onychomycosis but can be easily applied to all other onychopathies. This questionnaire consisted of three parts containing the following information in that order: the first part contained personal details about age, sex and profession; the second part contained the information about the impact of onychopathies on QoL; and the third part contained the information about the diagnosis, nail area involved, number of nails involved and the patient's medical history – which was to be completed by the dermatologist. The second part was related specifically to the onychopathies, with separate versions for involvement of fingernail and toenail. The scales for “feelings”, “stigma” and “symptoms” were included in this part. There were 24 questions for fingernails and 17 questions for toenails in this part. There were five possible responses to each question which ranged from “Not at all” to “Yes, very much” and a score of 1-5 was given to each response. Final score was equated on 0-100 scale.

According to onychopathies, the patients were classified into groups as follows: injury, onychomycosis, psoriasis, nail structure abnormalities (such as trachyonychia, pits, and onychoschisis) in non-psoriatic patients, other infections apart from onychomycosis (such as acute paronychia and *Pseudomonas aeruginosa* infection), lichen planus, chronic paronychia, shape disorders (such as koilonychia, clubbed fingers, and brachyonychia), subungual tumours, chromonychias (as a sign associated with systemic diseases such as drug-induced pigmentation, exogenous pigmentation and skin diseases apart from infections and psoriasis), other onychopathies (as signs associated with systemic diseases and skin diseases apart from psoriasis, lichen planus). These classification groups were chosen keeping in mind that there is more likely a different impact of different clinical nail signs on QoL, rather than a classical classification of a textbook. For example, nail signs from systemic diseases were classified into two groups, that is, chromonychias and shape disturbances, rather than considering them into a single group.

The data were analyzed in Statistical Package for Social Science (SPSS) software, version 25. Samples characteristics were assessed by descriptive statistics. The data were expressed in terms of Means, Standard Deviation

and Proportion. The Independent-t Samples test was used to compare the means between the two groups. Analysis of variance (ANOVA) was used to compare the impact of QoL between the different types of nail disorders. A *P* value of less than 0.05 was considered as statistically significant.

Results

All of 540 patients completed the questionnaire. There were no refusals. Demographics of the patients and diagnoses of the onychopathies are presented in [Table 1]. Onychopathies were found to be more prevalent in females comprising 137 (53.1%) patients in group F and 145 (51.4%) patients in group T. The majority of patients with onychopathies belong to the age group of 20-39 years comprising 87 patients (30.9%) in group F and 76 patients (29.5%) in group T. The most common profession of the patients was housewife comprising 118 (45.7%) patients in group F and 121 (42.9%) patients in group T. The most common onychopathy was onychomycosis comprising 109 (42.2%) patients in group F and 113 (40.1%) patients in group T followed by nail psoriasis comprising 51 (19.8%) patients in group F and 45 (16%) patients in group T.

Impact on QoL

Impact of the various onychopathies on QoL (mean values and 95% confidence intervals) is shown in Figure 1. ANOVA between groups showed a statistically significantly higher impact for onychomycosis, structure nail abnormalities and psoriasis among group F ($F = 6.491$, $P < 0.001$) and group T ($F = 7.335$, $P < 0.001$). QoL was statistically more significantly affected in patients having multiple nails involved in both group F ($F = 3.970$, $P = 0.020$) and group T ($F = 7.707$, $P = 0.001$) [Figure 2]. QoL was statistically significantly more affected in patients in the age group of <20 years in group F ($F = 7.465$, $P < 0.001$) and in the age group of 20-39 years in group T ($F = 34.316$, $P < 0.001$) as shown in Figure 3. QoL was statistically significantly more affected in women in both group F ($t(256) = 2.080$, $P = 0.038$) and group T ($t(280) = 4.665$, $P < 0.001$) as in Figure 4. The QoL impact was significantly higher among patients in group F compared to those in group T ($t(538) = 2.070$, $P = 0.039$) as shown in Figure 5. As the duration of nail diseases increased, the impact on QoL also increased significantly ($P < 0.001$) [Figure 6]. The patients with higher socioeconomic status had greater impact on QoL compared to the patients with lower socioeconomic status ($P < 0.001$) [Figure 7].

The score of the social, emotional and symptoms components of QoL impairment was compared between group F and group T.

Social component analysis

The score of the social component of QoL impairment was compared among males and females in both groups.

Table 1: Demographic characteristics for group F and group T

Variables	Subcategories	Group F		Group T	
		Number	Percentage	Number	Percentage
Sex	Female	138	53.5	145	51.4
	Male	120	46.5	137	48.6
Age distribution (years)	<20	59	22.9	53	18.8
	20-39	76	29.5	87	30.9
	40-59	42	16.3	46	16.3
	60-79	46	17.8	52	18.4
	≥80	35	13.6	44	15.6
Profession	Housewife	118	45.7	121	42.9
	Student	70	27.1	51	18.1
	Farmer	52	20.1	65	23.0
	Cook	13	5.03	25	8.9
	Others	5	1.9	20	7.1
Onychopathies spectrum	Injury	8	3.1	13	4.6
	Onychomycosis	109	42.2	113	40.1
	Structural nail disease	23	8.9	22	7.8
	Psoriasis	51	19.8	45	16
	Other infections	9	3.5	6	2.1
	Lichen planus	13	5.0	17	6.0
	Paronychia	15	5.8	26	9.2
	Others	5	1.9	6	2.1
	Shape disorders	6	2.3	6	2.1
	Tumor	6	2.3	9	3.2
	Chromonychia	13	5.0	19	6.7

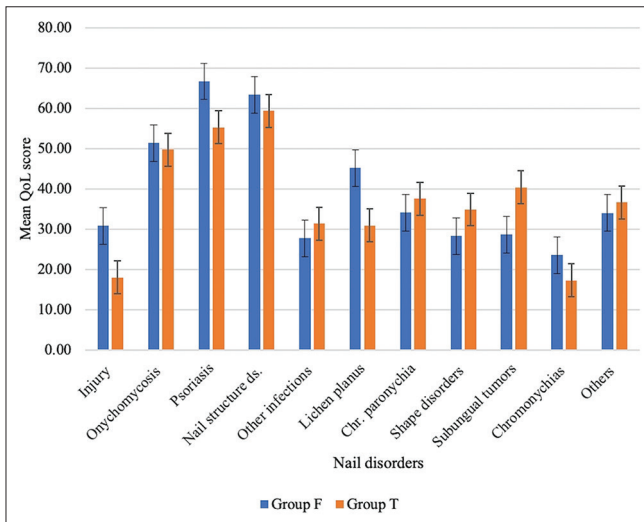


Figure 1: Association between QoL burden and nail disorders

The impact of the social functioning component of QoL was higher among females as compared with males in group F ($t(256) = 2.448; P = 0.015$) as well as group T ($t(280) = 4.431, P < 0.001$) [Figures 8 and 9].

Emotional component analysis

The score of the emotional component of QoL impairment was compared among males and females in both the groups. The impact of mental health (emotional) component of QoL was higher among females compared

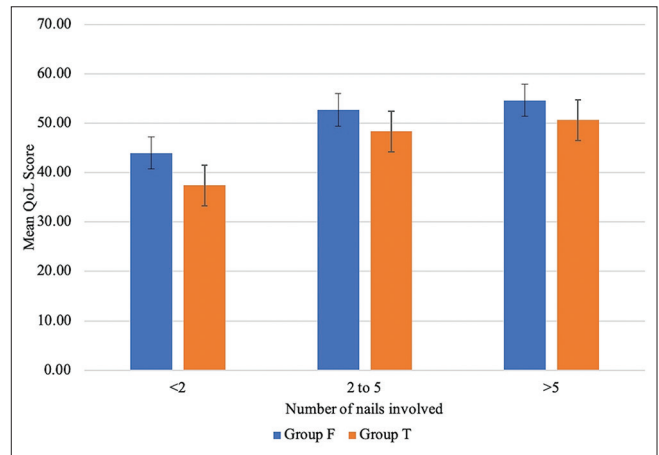


Figure 2: Association between QoL burden and number of nails affected

to males in group F ($t(256) = 2.533, P = 0.012$) as well as group T ($t(280) = 3.3885, P < 0.001$) as shown in Figures 8 and 9.

Symptoms component analysis

The score of the symptoms component of QoL impairment was compared among males and females in both the groups. The impact of symptoms component of QoL was also higher among females compared to males in group F ($t(256) = 2.994, P = 0.003$) as well as group T ($t(280) = 4.665, P < 0.001$) [Figures 8 and 9].

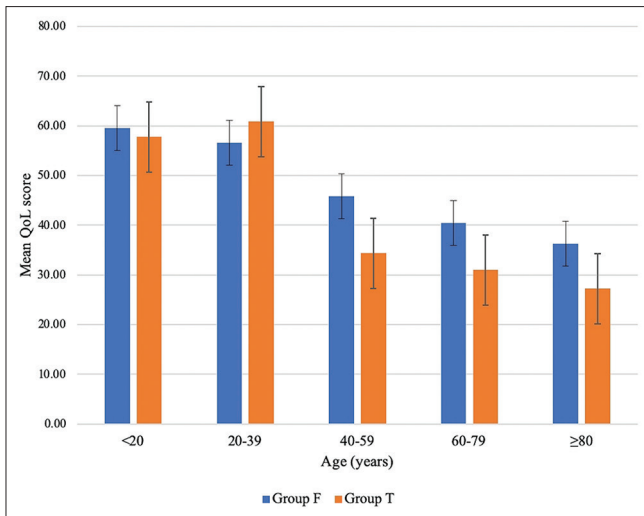


Figure 3: Age-wise comparison of impact on QoL

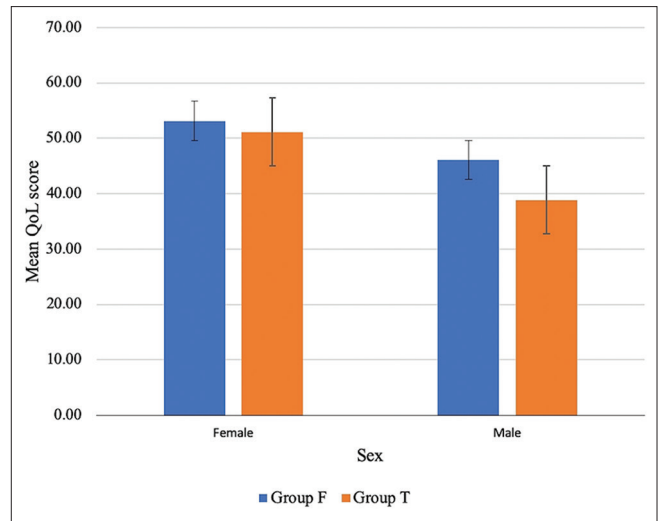


Figure 4: Gender-wise comparison of impact on QoL

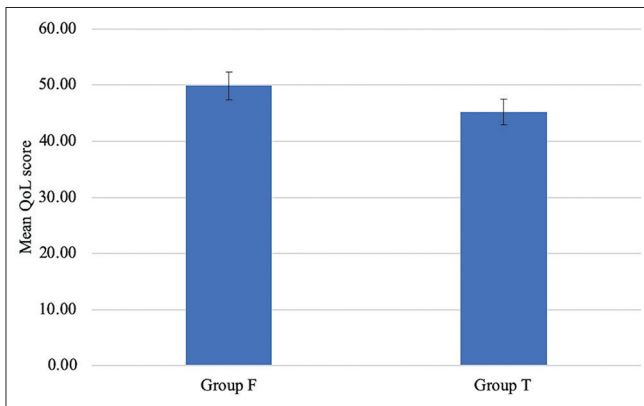


Figure 5: Comparison of impact on QoL between group F and group T

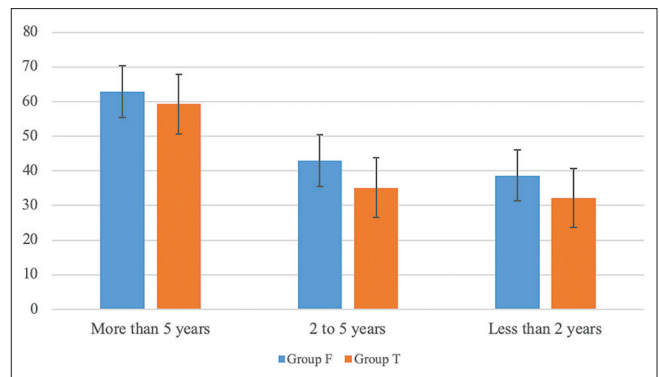


Figure 6: Association between QoL burden and duration of nail diseases

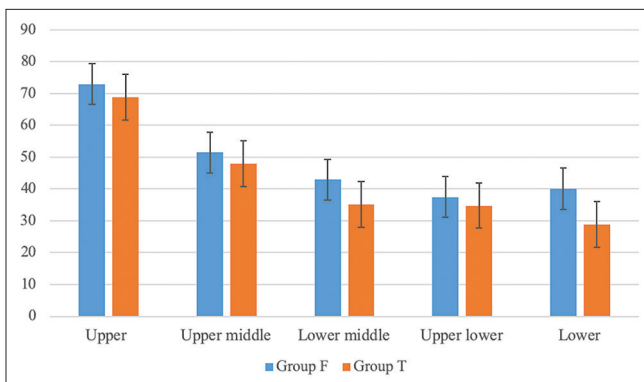


Figure 7: Association between QoL burden and socioeconomic status of patients

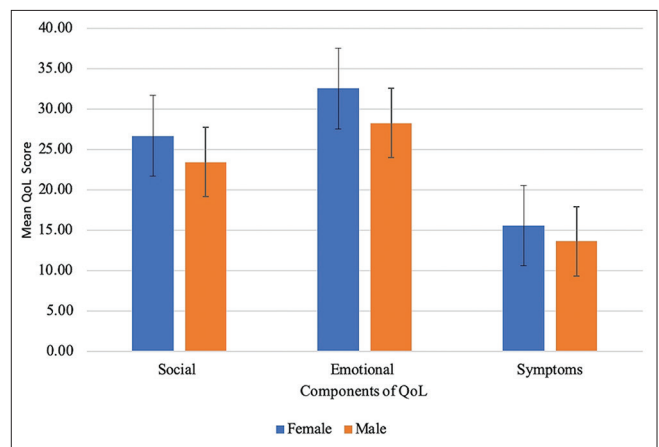


Figure 8: Impact of nail disorders on components of QoL in group F

Discussion

This study was conducted to evaluate the impact of onychopathies on QoL of the patient and to compare the severity of impact on QoL in various onychopathies. There is limited research on the impact of onychopathies on QoL, apart from onychomycosis^[1,5-11] and psoriasis.^[12-16] A study in Greece in 2013 by Belyavya *et al.*^[2] has assessed the impact

of nail disorders on QoL but no similar Indian study was found even after extensive search of literature. Katsambas *et al.* has studied the impact of foot disease on QoL and had found that the burden might be greater as compared to the previous reports.^[17] A review by Reich and Szepletowski conducted in 2011 found only three studies evaluating the impact on QoL in patients with onychopathies apart from

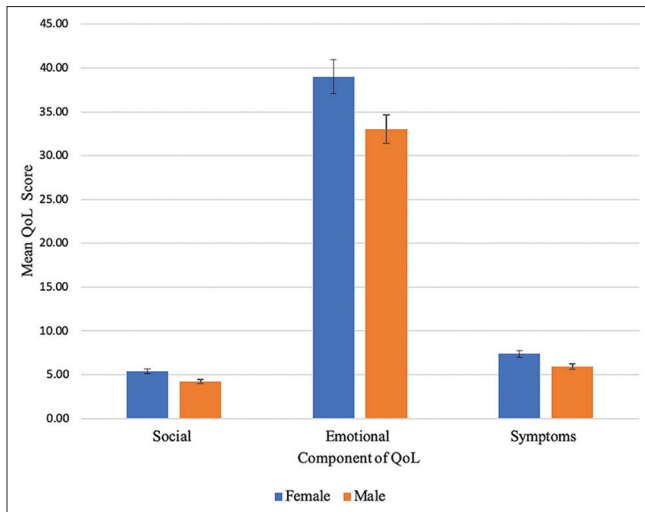


Figure 9: Impact of nail disorders on components of QoL in group T

onychomycosis and psoriasis, which used non-nail-specific questionnaires having doubtful validity.^[18] There is no validated tool to evaluate QoL in patients with nonspecific onychopathies. We used international onychomycosis specific questionnaire designed by Drake *et al.*^[4] which was also used previously by Belyayeva *et al.*^[2] This particular questionnaire was chosen because the questions used were not just limited to onychomycosis but could be applied to any onychopathy. Moreover, it has been used previously in several studies and various ethnic population.

Onychopathies were found to be more prevalent in the age group of 20-39 years in both group F (29.5%) and group T (30.9%). This probably occurs due to greater engagement in physical activity and concern for cosmesis. No other study has compared the age-wise distribution of onychopathies.

There was a slight predominance of females in our study (53.5% in group F and 51.4% in group T) which reflects that women seek medical advice more commonly due to cosmetic concern. Similarly, a study by Belyayeva *et al.*^[2] also observed female predominance in their study. The most commonly affected occupational group were housewives comprising 45.7% patients in group F and 42.9% patients in group T because of the wetting of hands among housewives and frequent microtrauma during household work which increases the chance of onychomycosis.

The most common onychopathy was onychomycosis comprising of 42.2% patients in group F and 40.1% patients in group T in our study. However, trauma was the commonest onychopathy in the study from Greece by Belyayeva *et al.*^[2] owing to the difference in the socio-cultural and environmental factors.

We also found that concurrent fingernail involvement (group F) had greater impact ($P = 0.039$) compared to

only toenail involvement (group T), which is consistent with studies by Drake *et al.*^[4] and Tabolli *et al.*^[6] This is probably because the lesions on fingernails are constantly visible and would, therefore, have a more severe impact on QoL. This was however not seen by Belyayeva *et al.*^[2] and was attributed by the author to the fact that the majority of the study population was women and the country of their residence had a long summer, due to which they had a greater chance to wear footwear that allows toenails to be visible for several months.

We found that there was a more severe impact on QoL in patients with multiple nails involved ($P = 0.020$ in group F and $P = 0.001$ in group T). Our results are in agreement with the study performed by Belyayeva *et al.*^[2], Tabolli *et al.*^[6] and Szepietowski *et al.*^[19]

The impact of onychopathies on QoL was higher among females compared to males in both group F ($P = 0.038$) and group T ($P < 0.001$) indicating that nail abnormalities are of greater importance for women. Similarly, most of the other studies have observed greater impairment of QoL among women.^[19] Furthermore, Drake *et al.*^[20] conducted a study on patients with onychomycosis and observed that women had greater embarrassment due to onychomycosis as compared to men.

We also found that as the duration of nail diseases increased the impact on QoL also increased significantly. Similarly, Tabolli *et al.*^[6] observed that there was greater impairment of HR-QoL in patients with longer duration of nail disease.

The patients with higher socioeconomic status had greater impact on QoL compared to the patients with lower socioeconomic status ($P < 0.001$). This is probably because of the greater self-consciousness and cosmetic concern among patients with higher socioeconomic status. No other study has compared the impact of socioeconomic status on QoL.

The impact of onychopathies on social functioning, emotional, and symptoms components of QoL was higher among females compared to males in both groups F and T. An extensive search of the literature did not reveal any study pertaining to the gender-wise impact of components of QoL.

In our study, people aged <20 years in group F and 20-39 years in group T ($P < 0.001$ in both groups F and T) were found to have more severe impact on QoL affected as compared to older generation probably because their nail appearance was of greater importance for them, influencing their interpersonal relationships. Furthermore, onychopathies also would have resulted in greater interference with the working ability of the younger working population and thus negatively impairing their social functioning. Our results are in agreement with the study by Szepietowski *et al.*^[21] who conducted the study on patients with toenail onychomycosis and observed the

greater impact on QoL among younger patients compared to the older patients.

We found that onychomycosis, nail psoriasis and structural nail diseases had greater impact among other onychopathies ($P < 0.001$ for both group F and T). A study done by Tabolli *et al.*^[6] showed that onychomycosis resulted in greater impairment of QoL. However, no data was available on other nail diseases analysis. Belyayeva *et al.*^[2] however reported that the impact on QoL was similar in trauma, onychomycosis, infections, structure abnormalities, psoriasis, inflammatory diseases, and paronychia and lower only in chromonychias and tumors.

Limitations

Since our hospital is a tertiary care center, population included in our study was not truly representative of general population. The questionnaire used in our study was devised by Drake *et al.* after validation and reused by Belyayeva *et al.*, concerns regarding its measurement of the social and emotional impact in Indian patients may be raised. Great toes and thumbs play a greater role in functionality and are most visible than other nails. However, the impact of great toe or thumb on QoL was not assessed separately in this study. We also did not differentiate patients based on the presence or absence of skin disease, which may influence QoL.

Conclusion

Onychopathies have a far-reaching adverse impact on QoL because of their grave physical, psychological and social impact. Dermatologists should be mindful that onychopathies are not only important because of cosmetic disfigurement, but they may be a symptom of underlying significant morbidity. Even though previous literature has emphasized more on the impact of nail psoriasis and onychomycosis on QoL, other onychopathies may also cause a significant impairment of QoL of patients. Hence, all onychopathies should be treated with more medical attention and utmost seriousness.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Annexure I

Annexure I: Proforma for assessment of Quality of Life impairment in onychopathies

(modified from: Drake LA, Patrick DL, Fleckman P, André J, Baran R, Haneke E, et al. The impact of onychomycosis on quality of life: Development of an international onychomycosis-specific questionnaire to measure patient quality of life. J Am Acad Dermatol 1999;41:189–96.)

Part I: Personal Details

- Age / Sex:
- Socioeconomic status (as per Modified Kuppuswamy Scale):
- Duration of disease:

Part II: Impact of nail diseases on QoL

The five possible responses to each question range from

1,“Not at all” to 5,“Yes, very much.”

Fingernail diseases quality of life questionnaire

SCORE: 1-5

Social

1. People find it unpleasant to look at my nails.
2. I think that other people notice my nail problem.
3. I feel uncomfortable shaking hands because of my nail problem.
4. I tend to hide my nails.
5. I feel my family and friends do not take my nail problem seriously.
6. My nails look neglected.
7. I am embarrassed when going out to eat or to a party.
8. I have to explain to others what is wrong with my nails.
9. Others are afraid of catching disease from me.

Emotional

10. I feel disheartened because of my nail problem.
11. It costs a lot of money to look after my nails.
12. I worry that my nail problem is contagious.
13. I feel self-conscious because of my nail problem.
14. I am upset by the appearance of my nails.
15. I worry about having this nail problem for the rest of my life.
16. I feel I have to keep my nails cut short.
17. I cannot forget that I have this nail problem.
18. My nail problem is a nuisance.
19. I worry this might spread.

The symptoms

20. My nails are thick and discolored.
21. I have difficulty cutting my nails.
22. I have pain in my fingers and nails.
23. The nails seem to be being eaten away.
24. I find it difficult to work with my hands

Toenail diseases quality of life questionnaire

SCORE: 1-5

Social

1. People find it unpleasant to look at my nails.
2. I think that other people notice my nail problem.

Emotional

3. My nails look neglected.
4. I feel disheartened because of my nail problem.
5. It costs a lot of money to look after my nails.
6. I worry that my nail problem is contagious.
7. I am upset by the appearance of my nails.
8. I worry about having this nail problem for the rest of my life.
9. I feel I have to keep my nails cut short.
10. I cannot wear the shoes I want.
11. I cannot forget that I have this nail problem.
12. My nail problem is a nuisance.
13. I worry this might spread.
14. The nails seem to be being eaten away.

The symptoms

15. My nails are thick and discolored.
16. I have difficulty cutting my nails.
17. I have pain in my toes and nails.

PART III: Diagnosis & Number of nails involved

No. of Nails affected:

Disease Classification:

1. Injury
2. Onychomycosis
3. Structural nail diseases
4. Psoriasis
5. Other infections
6. Lichen planus
7. Chronic Paronychia,
8. Others
9. Shape disorders
10. Subungual tumors
11. Chromonychias associated with systemic diseases