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Original Article

Quality of Life in Patients with Chronic Dermatophytosis in A Tertiary Care Hospital, Bangladesh

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ABSTRACT

Introduction: *Dermatophytes are the most common cause of superficial fungal infections in Bangladesh subcontinent and other tropical countries.* ***Objective:*** *The Dermatology Life Quality Index (DLQI) is used to determine the quality of life of patients with chronic dermatophytosis.* ***Methods & Materials:*** *The present cross sectional, observational, case-controlled study was conducted in Department of Dermatology & Venereology, Mymensingh Medical College & Hospital, Mymensingh Bangladesh from January to December 2023. Total number of cases collected were 250, 130 controls were also included. Clinically diagnosed and KOH positive adult patients were included in study. All patients were asked to fill DLQI questionnaire in Bangla. Controls having disease for less than six months were also included. Data thus obtained was collected and tabulated.* ***Results:*** *Total number of cases collected were 250, 130 controls were also included. In gender distribution, cases had 72.0% males and 28.0% female while controls had 63.1% males and 36.9% females. Mean DLQI of cases was 14.28±5.16 and controls was 11.56±3.60. DLQI distribution of cases -154(61.6%) had very large effect, 61(24.4%) had moderate effect, and 30(12.0%) had extremely large effect on DLQI. Domains of Symptoms and feelings (72.8%), work and school related activities (68.8%) and treatment related problems (67.6%) posed maximum impairment. The occurrence of lesions on both exposed and non-exposed sites and with increasing body surface area significantly increased the impairment of quality of life.* ***Conclusion:*** *In summary, superficial dermatophytoses affect*

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the quality of life (QoL) of all patients, but chronic dermatophytoses cause significantly greater impairment of a person's QoL, with some patients experiencing extremely severe impairment of their QoL.

Keywords: *Antifungal Agents, Dermatology, Pruritus, Quality of Life*

INTRODUCTION

Dermatophytes are the most common cause of superficial fungal infections in Bangladesh subcontinent and other tropical countries[1,2]. Over the past few years, dermatophytid infections have become one of the most common infective dermatoses presenting in dermatology OPD throughout country. Recent studies have documented a high prevalence rate of more than 50%[3]. More cases of chronic, recurrent and/or atypical dermatophytosis are coming forth which are unresponsive to treatment[4,5].

The prevalence of dermatophytosis is nearly 20-25% of the world's population, with the most common occurrence being skin and extremity disease. Illnesses associated with dermatophytosis include short incubation periods, chronic disease, contact with animals, geographical region, humidity, high temperature, and immunodeficiency[6-8]. Dermatophytosis is usually superficial and localized, but there are increasing reports of systemic, chronic, and persistent dermatophyte infections[9]. Health correlates of quality of life (QoL) are important tools for determining disease burden and treatment outcomes. The high prevalence of dermatophytosis represents a significant health problem and has a significant negative impact on quality of life[10,11]. The skin disease including dermatophytoses involves physical, cosmetic, psychological, and societal concerns. Precise measures of skin disease load may be evaluated not specifically in the manner of disabilities, but its negative impact on the quality of life.8 Quality of life is an imperative public health problem and it is defined as intellectual attentiveness to a person's satisfaction in life. The clinical spectrum of dermatophytosis has a negative influence on the quality of life (QoL) of infected persons[10]. Chronic and recurrent dermatophytosis are not only source of worry for patients and their family but also a therapeutic challenge for treating doctors[11]. Therefore, a more patient oriented approach in treatment of this disease is possible with an understanding of effect of chronic dermatophytosis on quality of life (QoL) and psychological morbidity[12]. Health related QoL measurement assesses burden of illness and allows assessment of the outcomes of medical treatment[13]. Evaluation of disease severity should include clinical, psychological and various social factors. A treatment should be considered ineffective until it improves QoL in patients[14]. Due to its high prevalence, widespread dermatophytosis is a major health problem that can have a significant negative impact on social, psychological and occupational health and significantly impair quality of life. Given the current prevalence of dermatophytosis, measurement of quality of life should be

an integral part of clinical trials evaluating the efficacy of treatment. There is little literature on quality of life in dermatophytosis (excluding onychomycosis) and none at all for chronic dermatophytosis[15-20]. Therefore, this study was designed to determine the quality of life of patients with chronic dermatophytosis using the DLQI. The study also compares the impact of chronic and non-chronic dermatophytosis on the quality of life of these patients.

METHODS & MATERIALS

The present cross sectional, observational, case-controlled study was conducted in Department of Dermatology & Venereology, Mymensingh Medical College & Hospital, Mymensingh Bangladesh from January to December 2023. Total number of cases collected were 250, 130 controls were also included. Clinically diagnosed and KOH positive adult patients were included in study. Patients unwilling to participate in study or to undergo investigations and who suffered from other chronic systemic, psychiatric or dermatological illnesses were excluded. Patients who had suffered a recent serious adverse life event were also excluded on the basis of a semi structured interview. Patients were further divided in two groups- first having illness for more than 6 months i.e. chronic dermatophytosis (cases) and second having illness for lesser duration i.e. non-chronic dermatophytosis (controls). We used convenience sampling and the data regarding basic demographic characteristics like presenting complaints, history, hygiene practices etc., was collected.

Data were analyzed by using SPSS software (version 21). Student's t-test and analysis of variance were applied for comparison of means and results are expressed, as mean ± SD. P value of less than 0.05 at confidence interval of 95% was considered statistically significant. DLQI and domain scores were correlated with various demographic variables.

RESULTS

Final analysis was done on 250 patients of chronic superficial dermatophytosis comprising the cases. One hundred and thirty age and sex matched patients of non-chronic superficial dermatophytosis constituted the control group ($p=0.43$ and $p=0.086$ respectively) (Fig-1). Among chronic dermatophytosis cases, DLQI was significantly affected by the extent and type of body surface area involved. Higher the body surface area involved; more was the effect on QoL. Also, DLQI scores increased significantly among cases having simultaneous involvement of both exposed and unexposed areas (**Table I**).

Table – I: Details of DLQI Scores and Various Parameters in Study Group (*n*=250)

Variables	Number (%)	Mean±SD	*p*-value
Age Group (years)			
18-40	203 (81.2)	14.01±5.14	0.537
41-60	44 (17.6)	15±5.23	
>60	3 (1.2)	13.33±0.58	
Gender			
Male	180 (72.0)	14.37±5.30	0.548
Female	70 (28.0)	13.96±4.73	
Body Mass Index			
<18.5 (Underweight)	42 (16.8)	13.77±5.66	0.884
18.5-25 (Normal)	153 (61.2)	14.34±5.06	
>25-30 (Obese)	10 (4.0)	15.00±5.60	
>30 (Overweight)	45 (18.0)	14.23±4.91	
Socio-economic Status (BG Prasad, 2016)			
Lower	16 (6.4)	14.82±4.39	0.274
Lower Middle	66(26.4)	14.84±5.18	
Middle	67 (26.8)	13.52±5.29	
Upper Middle	81(32.4)	14.65±5.03	
Upper	20 (8.0)	12.60±5.31	
Educational Status			
Till 5th Standard	49 (19.6)	14.62± 5.70	
6th-8th Standard	34 (13.6)	14.97± 4.76	0.322
9th-10th Standard	35 (14.0)	14.32± 4.54	
11th-12th Standard	68 (27.2)	14.13± 5.43	
Graduate	13 (5.2)	14.79± 4.76	
Post Graduate	51 (20.4)	13.80± 4.95	
Employment Status			
Employed	168 (67.2)	14.47± 5.06	0.312
Unemployed	82 (32.8)	13.79± 5.29	
Marital Status			
Single	102 (40.8)	14.01± 5.19	0.529
Married	148 (59.2)	14.41± 5.11	
Residential Status			
Rural	136 (54.4)	14.02± 4.80	0.73
Urban	83 (33.2)	14.51± 5.88	
Urban Slum	31 (12.4)	14.58± 4.49	
Family History			
Present	159 (63.6)	14.63±5.08	0.243
Absent	91 (36.4)	13.54±5.22	

Site of Involvement			
Exposed	3 (1.2%)	9.67± 3.79	0.004
Unexposed	156 (62.4)	13.58± 5.12	
Both	91 (36.4)	15.53± 4.94	
Body Surface Area Involvement			
<10%	44 (17.6)	9.24± 3.51	0.0001
10-20%	123 (49.2)	12.88± 3.86	
>20%	83 (33.2)	18.91± 3.70	
Hygiene Score			
Very good	25 (10.0)	13.04± 5.31	0.123
Average	206 (82.4)	14.22± 5.11	
Poor	19 (7.6)	16.15± 4.92	

Similar findings were recorded in the control group comprising patients of non-chronic dermatophytosis. Further, control group had significantly higher DLQI scores among patients giving the family history of similar infections (**Table II**).

Table – II: Details of DLQI Scores with Various Parameters in Control Group

Variables	Number (%)	DLQI Score (Mean±SD)	*p*-value
Age group (in years)			
18-40	100 (76.9)	11.70±3.49	0.63
41-60	23 (17.6)	10.92±3.27	
>60	7(5.5)	11.71±6.16	
Gender			
Male	82 (63.1)	11.92±3.64	0.13
Female	48 (36.9)	10.94±3.49	
Body Mass Index			
<18.5 (Underweight)	14 (10.7)	11.00±4.17	0.65
18.5-25 (Normal)	79(60.7)	11.48±3.43	
>25-30 (Obese)	29(22.3)	11.73±3.71	
>30 (Overweight)	8(6.1)	13.17±4.31	
Socio economic status (BG Prasad, 2016)			
Lower	6(4.6)	11.00±3.35	0.99
Lower Middle	28(21.5)	11.60±3.72	
Middle	32(24.6)	11.65±3.32	
Upper Middle	40 (30.7)	11.67±3.60	
Upper	24 (18.4)	11.36±4.15	
Educational Status			
Till 5th standard	36 (27.6)	11.24± 3.64	0.73

6th-8th standard	26 (20.0)	11.67± 4.07	
9th-10th standard	18 (13.8)	10.74± 3.41	
11th-12th standard	26 (20.0)	11.96± 3.29	
Graduate	20 (15.3)	12.38± 3.79	
Post graduate	4 (3.1)	11.00± 2.65	
Employment status			
Employed	85 (65.4)	12.00± 3.64	0.048
Unemployed	45(34.6)	10.72± 3.42	
Marital status			
Single	54 (41.5)	11.45± 3.66	0.67
Married	76 (58.5)	11.72± 3.59	
Residential status			
Rural	56 (43.1)	12.13± 3.61	0.06
Urban	50 (38.4)	10.64± 3.53	
Urban slum	24 (18.5)	12.16± 3.45	
Family History			
Present	74 (56.9)	12.21±3.53	0.016
Absent	56 (43.1)	10.71±3.54	
Site of involvement			
Exposed	2 (1.5)	10.5± 0.71	<0.001
Unexposed	90 (69.3)	10.81± 3.31	
Both	38 (29.2)	13.40± 3.73	
Body surface area involvement			
<10%	31 (23.8)	8.82± 2.51	<0.001
10-20%	83 (63.8)	11.57± 2.90	
>20%	16 (12.4)	16.05± 3.63	
Hygiene score			
Very good	27 (20.7)	11.10± 3.05	0.16
Average	83 (63.8)	11.40± 3.54	
Poor	20 (15.5)	12.95± 3.35	

DLQI scores were significantly higher among cases compared to controls. Domain wise analysis showed that majority of patients reported impairments in the domains of symptoms and feelings; work/school and treatment related problems among both the study groups as per **Table III**.

Table – III: DLQI Scores in Study Group and Control Groups

DLQI domains (Min-Max Scores)	DLQI Scores				*p*-value
	Cases (Chronic Dermatophytosis)		Controls (Non-chronic Dermatophytosis)		
	Mean±SD	Percentage (*n*=250)	Mean±SD	Percentage (*n*=130)	
Symptoms and feelings (0-6)	4.36±1.34	72.67	4.07±1.38	67.83	<0.001
Daily activity (0-6)	2.45±1.61	40.83	1.93±11.13	32.17	
Leisure (0-6)	0.99±1.28	16.50	0.63±0.92	10.5	
Work and school (0-3)	2.07±1.052	69.00	1.73±1.25	57.67	
Personal relationships (0-6)	2.28±1.68	38.00	1.59±1.25	26.5	
Treatment (0-3)	2.03±1.1	67.67	1.61±0.80	53.67	
Total	14.28±5.16	100	11.56±3.60	100	

QoL was affected in all the patients of the present study including both cases and controls (**Table IV**).

Table – IV: Details of DLQI Scores as Per Banding

	Case		Control	
DLQI	***n***	**%**	***n***	**%**
Small effect	5	2.0	3	2.3
Moderate effect	61	24.4	55	42.3
Very large effect	154	61.6	72	55.4
Extremely large effect	30	12.0	0	0
p<0.0001				

DISCUSSION

The concept of quality of life (QoL) in the health care system is multidirectional and includes physical, mental and social well-being, as well as financial and functional objectives[10]. Skin diseases such as acne, psoriasis and eczema are associated with a significant decrease in the quality of life of patients[21,22]. There are several instruments to assess the quality of life (QoL) of adults and children with skin diseases, which can help to understand their impact[22]. Dermatophytosis is a significant public health problem, as recurrences and chronicity have a significant physical and psychological impact on the health of patients. Therefore, their impact on quality of life was determined using the Dermatology Life Quality Index (DLQI) analytical tool. This tool is already used for a variety of skin diseases and provides a simple way to measure the impact of skin diseases

on quality of life[23]. The DLQI is an important tool and will play a key role in assessing the impact of dermatophytosis and other skin diseases on the community, treatment guidelines, and the social and economic aspects and capabilities of patients. QoL includes physical, sexual, social, psychological, educational, occupational and financial aspects in the general wellbeing of a person. Mere presence of any dermatological disease can have an impact on various aspects of QoL. QoL measures in patients with skin lesions are an important area of future research because they can supplement measures of clinical severity for comprehensively assessing disease and treatment outcomes[24]. DLQI is the most frequently used QoL instrument in randomized controlled trials or epidemiological studies for various dermatological diseases. Though Basra et al. reported extensive use of DLQI from developing countries[25], the QoL for patients with skin disease in developing countries has continued to be a major problem because related issues have not been adequately addressed. In the last couple of years, a lot of literature has appeared from Bangladeshi subcontinent regarding clinical presentations and magnitude of chronic dermatophytosis. In the present study, majority of patients were young (<40 years of age) and males. This may be due to increased physical activity and increased exposure to people and environment among young males as proposed in past studies[26,27]. The total DLQI was significantly more among cases compared to the control group ($p<0.001$). A fraction of patients having chronic dermatopohytosis also showed extremely large effect on the QoL. The present study clearly demarcates the two groups of superficial cutaneous dermatophytosis: chronic v/s non-chronic, based on the QoL measurements. These two groups had significantly different DLQI scores with chronic dermatophytosis showing statistically higher scores in every domain of DLQI. The absolute DLQI scores in present study are much more than the few recent studies for psoriasis, acne and vitiligo from India[28-30]. This delineates the alarming severity of hitherto thought 'benign' dermatophytic infection. Chronic dermatophytosis has a substantial effect on quality of life. These results are similar to the recently published studies regarding dermatophytosis as a whole from Indian subcontinent[15,16,26]. Among these only ***Patro et al.*** demonstrated significantly higher DLQI scores in patients having more than months' duration of lesions and patients with more than 10% BSA affected[15]. Past studies have raised concerns about non-responsiveness to the routine dosage and duration of antifungals for chronic dermatophytosis[31]. The family members have a significant role in dermatophytosis as it is a highly contagious disease. Comorbidity is a significant risk factor in all infectious diseases. However, at present the majority of cases were healthy and it is an alarming situation for public health or the community. The majority of patients were with history of more than 3 months duration of dermatophytosis. The recurrence of the diseases may result from different factors including,

financial, social, lack of awareness, treatment discontinuity, and the emergence of resistance. In the present study, maximum impairment was seen among the patients having lesions in both exposed and unexposed parts of the body. Also, patients having lesions only in unexposed sites showed a larger effect on QoL compared to patients having lesions in only exposed sites. This association has not yet been reported in earlier studies. Contrary to popular belief, this finding reiterates the fact that skin diseases bring about the same feeling of embarrassment, no matter whether exposed or unexposed sites of the body are involved[32]. In fact, lesions on exposed parts of the body may cause much more discomfort or psychological distress to a patient during intimacy with the partner. Site of involvement and body surface area were the two parameters having significant impact on QoL ($p<0.05$) in the present study. The study shows a direct proportional increasing effect on QoL as the body surface increased among patients of chronic dermatophytosis. Again, these findings are similar to the study by Patro et al. [15] However, Drake et al stated that severity and quality of life are two separate and different measurements that often do not overlap[33]. There are no other studies presently to assess the QoL in patients having chronic dermatophytosis but in a study by ***Mushtaq et al.*** it has been reported that increase in duration of tinea infection increases DLQI score[34]. Worldwide there are studies describing DLQI in cutaneous fungal infections, mainly onychomycosis, but none for chronic dermatophytosis[33,35]. The DLQI scores in these past studies were far less than the present study for chronic dermatophytosis. This study uses only literate patients as DLQI is self-administered instrument. Researches have raised doubts regarding the scientific limitations of DLQI outweighing the practicalities of its use[36].

CONCLUSION

This derangement increases with increasing body surface area involvement. Quality of life is also more affected in chronic infections and involvement of both exposed and unexposed body sites. While superficial dermatophytosis affects QoL in all patients, chronic dermatophytosis has a significantly more derogatory effect on the quality of life of a person with some of the patient also showing extremely large effect on QoL. Numerous studies are currently being conducted to clarify the epidemiological burden of the disease, but future studies should also take into account quality of life issues when treating these patients. It would be interesting to study psychiatric disorders caused by chronic dermatophytosis. Furthermore, chronic dermatophytosis should be considered as a separate disease, since in addition to the usual antifungal therapy, other or additional treatments with a more careful, humane and sensitive approach are required. Appropriate treatment should include effective health education and counseling in the management of chronic dermatophytosis.

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Conflict of Interest
The authors declare no conflict of interest.

REFERENCES

1. *Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas CR, Sardana K, et al. Expert consensus on the management of dermatophytosis in India (ECTODERM India). BMC Dermatol. 2018; 18:6.*
2. *Pokharel A, Yaptinchay C, Thaebtharm AE. Comparison of clotrimazole 1% cream with 50% tea tree oil extract in a cream base for the treatment of tinea corporis/cruris: A randomized controlled trial. Nepal Journal of Dermatology, Venereology and Leprology 2015;13(1):24-30.*
3. *Naglot A, Shrimali DD, Nath BK, Gogoi HK, Veer V, Chander J, et al. Recent trends of Dermatophytosis in Northeast India (Assam) and interpretation with published studies. Int J Curr Microbiol App Sci 2015;4(11):111-20.*
4. *Dogra S, Narang T. Emerging atypical and unusual presentations of dermatophytosis in India. Clin Dermatol Rev 2017; 1:12-8.*
5. *Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: An appraisal. Indian J Dermatol 2017; 62:227-36.*
6. *AL-Khikani FH. Dermatophytosis a worldwide contiguous fungal infection: Growing challenge and few solutions. Biomed Biotechnol Res J, 2020;4:117-22*
7. *Andrews MD, Burns M. Common tinea infections in children. Am Fam Physician, 2008;77:1415-20*
8. *AL-Janabi AA. Dermatophytosis: Causes, clinical features, signs and treatment. J Sympt Signs, 2014;3:200-3.*
9. *Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas CR, Sardana K, Godse K, Patel K, Rengasamy M, Rudramurthy S, Dogra S. Expert consensus on the management of dermatophytosis in India (ECTODERM India). BMC dermatology. 2018 Dec;18:1-1.*
10. *Mushtaq S, Faizi N, Amin SS, Adil M. Mohammad Mohtashim1 Impact on quality of life in patients with dermatophytosis. Australas J Dermatol, 2020; 61(2): e184-e188.*
11. *Varshney AP, Gahalaut P, Pardal PK, Mishra N, Rastogi MK, Thapa M. Quality of life in patients with chronic dermatophytosis. Nepal J Dermatol, Venereol and Leprol, 2020;18(1):44-51.*
12. *Rajashekar TS, Nandigonnanavar S, Kuppuswamy SK, Madhavi GS. Dermatology life quality index in patients with persisting and recurrent dermatophytoses. Int J Res Dermatol, 2019;5(1):139-143.*
13. *Guyatt GH, Feeny DH, Patrick DL. Measuring Health-Related Quality of Life. Ann Intern Med 1993;118: 622-629.*
14. *Gahalaut P, Mishra N, Soodan PS, Rastogi MK. Effect of Oral PUVAsol on the quality of life in Indian patients having chronic plaque psoriasis. Dermatol Res Pract. 2014; 2014:291586.*
15. *Patro N, Panda M, Jena AK. The menace of superficial dermatophytosis on the quality of life of patients attending referral hospital in Eastern India: A cross sectional observational study. Indian Dermatol Online J. 2019; 10:262-6.*
16. *Narang T, Bhattacharjee R, Singh S, Jha K, Mahajan R, Dogra S. Quality of life and psychological morbidity in patients with superficial cutaneous dermatophytosis. Mycoses 2019 Aug;62(8):680-5. https://doi.org/10.1111/myc.12930*
17. *Shaikh Z, Pathak R. Revised Kuppuswamy and BG Prasad socio-economic scales for 2016. Int J Community Med Public Health. 2017; 4(4):997- 9.*
18. *Turabelidze G, Lin M, Wolkoff B, Dodson D, Gladbach S, Zhu B-P. Personal hygiene and methicillin-resistant Staphylococcus aureus. Emerg Infect Dis. 2006; 12:422-7.*
19. *Finlay AY, Khan G. Dermatology Life Quality Index (DLQI)-a simple practical measure for routine clinical use. Clin Experiment Dermatol. 1994 May; 19(3):210-216.*
20. *Lakshmanan A, Ganeshkumar P, Mohan SR, Hemamalini M, Madhavan R. Epidemiological and clinical pattern of dermatomycoses in rural India. Indian J Med*

Microbiol. 2015 Feb;33(5):134.

21. *He Z, Marrone G, Ou A, Liu H, Ma L, Huang Y, Li Y, Sun L, Bai Y, Liu W, Zha X & Lu C. Factors affecting health-related quality of life in patients with skin disease: cross-sectional results from 8,789 patients with 16 skin diseases. Health Qual Life Outcomes. 2020, 18: 298.*
22. *Smidt AC, Lai J-S, Cella D, Patel S, Mancini AJ, Chamlin SL. Development and validation of Skindex-Teen, a quality-of-life instrument for adolescents with skin disease. Arch Dermatol. 2010; 146(8):865-9.*
23. *Basra MKA, Chowdhury MMU, Smith EV, Freemantle N, Piguet V. A review of the use of the dermatology life quality index as a criterion in clinical guidelines and health technology assessments in psoriasis and chronic hand eczema. Dermatol Clin. 2012;30(2):237-44.*
24. *Abolfotouh MA, Al-Khowailed MS, Suliman WE, Al-Turaif DA, Al-Bluwi E, Al-Kahtani HS. Quality of life in patients with skin diseases in central Saudi Arabia. Int J Gen Med. 2012; 5:633-42.*
25. *Basra MK, Fenech R, Gatt RM, Salek MS, Finlay AY. The Dermatology Life Quality Index 1994- 2007: a comprehensive review of validation data and clinical results. Br J Dermatol. 2008 Nov; 159(5):997-1035.*
26. *Rajashekar TS, Nandigonnanavar S, Kuppuswamy SK, Madhavi GS. Dermatology life quality index in patients with persisting and recurrent dermatophytoses. Int J Res Dermatol. 2019; 5:139-43.*
27. *Surendran K, Bhat RM, Boloor R, Nandakishore B, Sukumar D. A clinical and mycological study of dermatophytic infections. Indian J Dermatol. 2014; 59:262-7.*
28. *Nayak PB, Girisha BS, Noronha TM. Correlation between disease severity, family income, and quality of life in psoriasis: A study from South India. Indian Dermatol Online J. 2018 May; 9(3):165.*
29. *Hazarika N, Rajaprabha RK. Assessment of life quality index among patients with acne vulgaris in a suburban population. Indian J dermatol. 2016 Mar; 61(2):163.*
30. *Mishra N, Rastogi MK, Gahalaut P, Agrawal S. Dermatology specific quality of life in vitiligo patients and its relation with various variables: a hospital based cross-sectional study. J Clin and Diag Res. 2014Jun; 8(6):YC01-3.*
31. *Bishnoi A, Vinay K, Dogra S. Emergence of recalcitrant dermatophytosis in India. Lancet Infect Dis. 2018 Mar; 18(3):250-1.*
32. *Ludwig MWB, Oliveira MSO, Müller MC, Moraes JD. Quality of life and location of the lesion in dermatological patients. An Bras Dermatol. 2009; 84(2):143-50.*
33. *Drake LA, Scher RK, Smith EB, Faich GA, Smith SL, Hong JJ, et al. Effect of onychomycosis on quality of life. J Am Acad Dermatol. 1998 May;38(5):702-4.*
34. *Mushtaq S, Faizi N, Amin, SS, Adil M, Mohtashim M. Impact on quality of life in patients with dermatophytosis. Australas J Dermatol. 2020; 61:e184-8.*
35. *Gupta AK, Mays RR. The impact of onychomycosis on Quality of life: A systematic review of the available literature. Skin Appendage Disord. 2018; 4:208-16.*
36. *Nijsten T. Dermatology life quality index: time to move forward. J Invest Dermatol. 2012 Jan;132(1):11-3.*