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Factors associated with quality of life among patients with chronic plaque psoriasis: A cross-sectional multicentre study in Sri Lanka

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ABSTRACT

Introduction: Chronic plaque psoriasis (CPP) has a considerable negative impact on patients' health-related quality of life (QoL). This study investigated the sociodemographic and disease characteristics associated with QoL of patients with CPP.

Methods: This Cross-sectional multicentre study included 297 patients with CPP, aged 18 years or older attending dermatology clinics of National Hospital Galle, General Hospitals Matara and Hambantota. The QoL was assessed using Sinhala validated versions of Dermatology Life Quality Index (DLQI) and Psoriasis Disability Index (PDI) while disease severity was determined by psoriasis area severity index (PASI) and the involvement of body surface area (BSA).

Results: The study participants had a median age of 55 years (IQR: 42-63), with 57.6% being males. Median (IQR) PASI and BSA were 4.8 (2.8-10.2) and 9% (4.5-21), respectively. Based on DLQI estimation, 35% subjects had moderate to severe impairment of QoL while further 40% had mild impairment. Median (IQR) PDI score was 6 (3-10).

Both BSA and PASI showed significant and positive correlations with DLQI and PDI (spearman rho for BSA/DLQI 0.24, PASI/DLQI 0.18, BSA/PDI 0.32, PASI/PDI 0.31, $p<0.01$ for all). Age showed negative correlations with both DLQI and PDI (spearman rho for DLQI -0.26, PDI -0.25, $p<0.01$ for both). The impairment of QoL and disability was greater among men compared to women, current smokers compared to past or non-smokers, and those with lower limb involvement or pruritus compared to those without. There was no association between duration of the disease, level of education and social class with either the QoL or disability.

Conclusions: In patients with CPP, greater skin involvement, male gender, and being young are associated with poor QoL determined by both skin and disease specific tools.

Keywords: *Dermatology life quality index, Psoriasis, Psoriasis disability Index, Quality of life.*

Introduction

Psoriasis is a chronic inflammatory skin disease with remissions and relapses, associated with a multitude of metabolic abnormalities and poor quality of life (QoL). The impaired QoL is partly attributed to the chronic nature of the disease, cosmetic effects particularly due to the involvement of sensitive areas of the body and remission-targeted treatment which fails to eradicate the disease (1). Furthermore, common symptoms such as troublesome itch, redness and scaling also have a negative impact on their personal life (2, 2). The comorbidities associated with psoriasis such as metabolic diseases, cardiovascular disease and obesity and complications of psoriasis including erythroderma and arthritis also contribute to the poor QoL and productivity (4, 5). The impaired QoL associated with psoriasis is either similar or even worse than that of major medical diseases including diabetes, coronary artery disease and cancer (6, 7).

The negative impact of psoriasis involves many areas of personal life including professional career, income, relationships and leisure (8). Kumsa, *et al.,* (2021) reported that apart from the disease, many factors related to socio-demography are also associated with QoL among patients with psoriasis (9). This acts in a vicious cycle leading to poor productivity and increased health care burden (10, 11). Therefore, in the current management protocols, the improvement of the QoL is considered a major therapeutic goal (12, 13). Since the QoL associated with psoriasis involves many domains such as physical, social and psychological well-being, a wide range of objective tools are being used to assess the QoL of these patients.

The tools assessing the health-related QoL among patients with psoriasis are used in both clinical and research settings and they include generic tools such as the General Health Questionnaire, Sickness Impact Profile, and 36-Item Short-Form Health Survey (SF-36) questionnaire and Dermatology life quality index (DLQI), which is skin specific. In addition, disease specific questionnaires such as the Psoriasis Disability Index (PDI), Psoriasis-Related Stressor Scale are also being used to assess the QoL of patients with psoriasis. It appears that none of these tools are capable of capturing all domains of QoL in psoriasis due to the complexity of the disease. Therefore, elements of QoL which are meaningful for clinical setting are yet to be described (14, 15).

In Sri Lanka, the QoL of patents with psoriasis is not adequately assessed partly due to the poor awareness of its existence and busy clinical settings. Research on the QoL of patients with psoriasis is important to enhance the awareness of clinicians as well as healthcare authorities in order to provide a better care for patients. Therefore, the aim of the study was to evaluate the factors that are linked with the QoL and disability among patients with chronic plaque psoriasis in Sri Lanka.

Methods

This study was conducted as a cross-sectional study at three tertiary care centres in the Southern province of Sri Lanka. These state-run free health care facilities namely National Hospital Galle and General Hospitals at Matara and Hambantota cater to nearly 3.5 million population (16). Patients with psoriasis attending dermatology clinics of aforementioned hospitals were invited to participate in the study after obtaining informed written consent. Consecutive patients, aged 18 years or more, were recruited concurrently from the three study centres until the sample size was achieved. Patients with erythroderma, generalized pustular psoriasis de novo and psoriatic arthritis per se without skin involvement were excluded from the study. The demographic and disease related data were obtained using an interviewer-administered questionnaire. The presence and the severity of itch was assessed using a 10-point visual analogue scale. Skin examination was performed by the principal investigator to assess the body surface area (BSA) involved and the severity of the disease using the rule of nine and the Psoriasis Area and Severity Index (PASI), respectively. The QoL was assessed using a self-administered questionnaire including the Sinhala validated version of Dermatology Life Quality Index and Psoriasis Disability Index. The standard procedures stated in the questionnaires were followed and the completed questionnaires were collected immediately after they were marked. Skin examination was performed by the principal investigator and included the assessment of phenotype and severity of psoriasis using the Psoriasis Area Severity Index (PASI).

The ethical approval for the study was obtained from the Ethics Review Committee, Faculty of Medicine of University of Ruhuna (Reference no.3. 6: 15.02.2018).

Study tools

Sinhala version of Dermatology Life Quality Index (DLQI) questionnaire

The Sinhala version of DLQI questionnaire used in present study has a high internal consistency value and a satisfactory test-retest reliability (17). The DLQI includes 10 questions and depending on the total score the QoL is categorised. A score of 0-1 classified as no effect on patient's life, 2-5 as small effect, 6-10 as moderate effect , 11-20 as very large effect and 21-30 as extremely large effect on patient's life (18).

Psoriasis Disability Index (PDI)

The Sinhala version of PDI, a proven valid and reliable tool to assess the burden of psoriasis among Sinhala conversant patients in Sri Lanka was used for the current study (19). It has a high internal consistency with an overall Cronbach α of 0.86. The total score is calculated by adding the score of 15 items and higher scores represent greater disease disability.

Psoriasis Area and Severity Index (PASI)

PASI is validated tool to assess the severity of psoriasis with a high intra-rater and inter-rater reliability (20, 21). The basic lesional characteristics including erythema, scaling, induration of plaques and the skin surface area involved are considered in the scoring of severity.

Psoriasis Epidemiology Screening Tool (PEST)

The PEST is a quick and effective tool, validated in many languages and widely used in clinical settings to screen psoriatic arthritis. The performance of Sinhala version of Psoriasis Epidemiology Screening Tool to screen psoriatic arthritis has been satisfactory (22).

Statistical analysis

Descriptive data of the study sample are given as median (IQR) or number (%). The associations between QoL measures and demographic and disease related characteristics were determined by the Spearman rho correlation and independent sample median test between groups. $p<0.05$ was taken as the level of statistical significance in all analyses.

Results

There were 297 patients with psoriasis; 45% from National Hospital Galle, 31% from General Hospital Matara and 24% from General Hospital Hambantota. The mean age of participants was 52 years (SD: 12), with 57.6% being male. Regarding educational status, the majority had secondary education (65.7%), followed by tertiary education (17.2%), primary education (3.4%), and no schooling (0.3%). Based on the Baker and Hall classification, most participants were from social class 4 (46.1%), followed by class 3 (22.2%), class 5 (16.2%), class 2 (12.8%), and class 1 (2.7%). Smoking habits revealed that 15.8% were current smokers, 27.9% were former smokers, and 56.2% had never smoked.

Regarding the disease characteristics, a median disease duration of 10 years (IQR: 4-20) and a family history of psoriasis was reported by 23%. Pruritus was present in 70.7%, with a median itch score of 3 (IQR: 0-5). The median BSA involved was 9% (IQR: 4.5-21), and the median PASI was 4.8 (IQR: 2.6-10.2). Treatment consisted of methotrexate (41%), topical applications alone (52.5%), and a small proportion receiving other systemic therapies (5.3%) or phototherapy (0.6%).

The median (IQR) DLQI was 4 (1-7) and 75% had some impairment of the QoL; 35% moderate or severe impairment and 40% mild impairment. The median (IQR) PDI score was 6 (3-10) and the domain of daily activities was the most affected subcategory (Table 1).

Both BSA and PASI showed significant and positive correlations with both DLQI and PDI. Age, however, showed inverse correlations with both DLOI and PDI. Based on the PASI, severe disease was 1.8 times more prevalent in men

compared to women. In addition, the degree of itch showed a positive correlation with PDI. The duration of psoriasis showed no significant associations with either DLQI or PDI (Table 2). Of the five subdivisions of PDI, four; daily activities, employment, personal relations and leisure, showed significant but weak yet significant positive correlations with the PASI (Table 3)

In subgroup analyses, a greater impairment in QoL and disability was observed in men compared to women and in current smokers compared to past or non-smokers. Those with pruritus compared to those without had higher disability index (Table 4).

When considering the four body regions namely head and neck, trunk, lower limb and upper limb, the disability scores were significantly higher when any of the region is affected compared to non-affected. Greater impairment of the QoL was observed when the lower limb or the trunk was involved (Table 4).

There was no difference in the QoL and disability between those screened positive and negative for psoriatic arthritis using the Sinhala validated PEST. In addition, no statistically significant association was observed in QoL and disability with level education, social class or the type of treatment (Table 4).

Table 1: Descriptive data of PDI subcategories among 297 patients with psoriasis

	Mean	Median	IQR
Daily Activities (Q1-5)	3.60	3.0	(2.0 - 5.5)
Work School or Alternative (Q6 -8)	1.61	1.0	(0.0 - 3.0)
Personal relations (Q9-10)	0.33	0.0	(0.0 - 0.0)
Leisure (Q11-14)	1.43	1.0	(0.0 - 2.0)
Treatment (Q15)	0.24	0.0	(0.0 - 0.0)
PDI Total	7.20	6.0	(3.0 - 10)

** PDI - Psoriasis Disability Index*

Table 2: Associations of selected patient or disease related factors and the measures of QoL (Spearman rho) among 297 patients with psoriasis

	DLQI	PDI
Age	- 0.26*	-0.25*
Duration of Psoriasis	- 0.09	0.05
Degree of Itch	N/A	0.26*
BSA	0.24*	0.32*
PASI	0.18*	0.31*

** p < 0.05; PASI - Psoriasis Area and Severity Index; BSA - Body Surface Area*

Table 3: Associations between PASI and subdivisions of PDI

Subdivisions of PDI	Median	IQR	Spearman rho with PASI	*p* value
Daily activities (max 15)	3.0	2.0 - 5.5	0.30	< 0.01
Employment (max 9)	1.0	0.0 - 3.0	0.19	< 0.01
Personal relations (max 6)	0.0	0.0 - 0.0	0.12	< 0.05
Leisure (max 12)	1.0	0.0 - 2.0	0.24	< 0.01
Treatment (max 3)	0.0	0.0 - 0.0	0.09	0.25
PDI total (max 45)	6.0	3.0 - 10.0	0.31	< 0.01

** PDI - Psoriasis Disability Index*

Table 4: Factors associated with QoL and Disability in Psoriasis

	DLQI Median IQR)	*p* value	OR	PDI Median IQR)	*p* value	OR
Gender						
Male	4 (2-7)	0.04*	1.7	6 (3-12)	0.02*	1.8
Female	3 (1-6)			5 (2-9)		
Level of Education						
≥ Secondary	4 (1-7)	0.95		6 (2.8-10.2)	0.44	
< Secondary	4 (1-7)			6 (3-10)		
Social Class						
Skilled	4 (2-7)	0.87		6 (2-10)	0.79	
Non-skilled	4 (1-7)			6 (3-12)		
Smoking						
Current	5 (2-9)	0.35		8 (4-11)	0.04*	2.0
None	4 (1-6)			5 (2-10)		
Area of involvement						
Head and neck						
Yes	4 (2-7)	0.06		6 (3-12)	0.002*	2.69
No	3 (1-6)			4 (1-7)		
Upper limb						
Yes	4 (2-7)	0.12		6 (3-10.5)	0.02*	2.11
No	3 (1-6)			4 (2-8.8)		
Lower Limb						
Yes	4 (2-7)	0.004*	3.18	6 (3-11)	0.002*	3.69
No	2 (1-4)			2 (1-6)		
Trunk						
Yes	4 (2-7)	0.002*	2.35	6 (3-11)	0.001*	2.69
No	3 (1-5)			4 (1-7)		
Pruritus						
Present	N/A	N/A		6 (3-11.2)	0.01*	2.1
Absent				4 (2-9)		
Screening for Psoriatic arthritis						
Positive	6 (3-10)	0.35		4 (2-6)	0.55	
Negative	6 (2-11)			4 (1-7)		
Treatment						
Systemic	4 (1-7.5)	0.28		6 (3-12)	0.12	
Topical alone	4 (1-6)			5 (2-9)		

** $p < 0.05$*

Discussion

Among the study subjects in this cross-sectional study, 75% were observed to have impaired QoL ranging from mild to severe form. Impaired QoL was associated with male gender, younger age, presence of pruritus, current smoking and severe disease. The QoL of these subjects, however, did not show associations with the level of education, social class, current treatment, disease duration or the presence of psoriatic arthritis.

Our results are concordant with previous studies showing positive associations between the severity of disease and both impaired QoL (23) and disability (23-25) in patients with psoriasis. These studies have used both PASI and patient reported severity tools for the assessment of the severity of psoriasis while the QoL was assessed using both skin specific and generic tools (26, 27). Korte, *et al.*, in a systemic review of eight studies evaluating the disease severity and QoL, observed a wide variation of correlation coefficients (-0.11 to +0.40) (28). Nicole *et al*, Finlay and Coles, *et al.,* assessing the severity of disease using BSA and PDI showed comparable results to our study findings (23, 24). In addition, Finlay, *et al.,* assessing relationship between the disease severity using PASI and PDI reported similar correlation coefficient to the present study (25).

Studies examining the association between gender and the QoL have generated inconsistent results. While many studies have shown the impaired QoL to be more prevalent among women compared to men, (29-31) Jung, *et al.,* reported opposite results (32). Furthermore, some studies have found no difference in the QoL between men and women with psoriasis (33-35). Similarly, Gupta, *et al.,* described the impact of psoriasis on QoL is comparable in both genders, although it was found that men encountered greater work-related stresses (35). The current study found that the impaired QoL is more prevalent in men compared to women. Furthermore, men had more severe disease compared to women which could have contributed to the gender difference in the QoL we observed.

The impairment of the QoL in psoriasis has been linked to the region of the skin involved. A Taiwanese study by Yang, *et al.,* reported that the site of the involvement has a great influence on the QoL (36), particularly in visible areas including hand and face (24, 36-38), while visible areas had shown higher threshold of PASI responses with treatment to improve the QoL (39). Further the clearance of psoriasis in visible body regions has a considerable impact on the QoL improvement (37). We found the impact of QoL and disability was highest with the lower limb involvement. This could be explained by the severe disease involving the lower extremities which is reflected by the high regional PASI contribution (Table1) and studies have shown a slower improvement of the lower extremity plaques even with treatment (40) which also may lead to poor QoL.

The current study is multicenter study and we evaluated the QoL and the disability of study subjects using validated questionnaire and these are positive attributes of the study. All study subjects, however, were drawn from the Southern province of Sri Lanka and the majority of study subjects were Sinhalese Buddhists and the applicability of these findings to other ethnic groups and people following other religions is uncertain. Further, we did not analyse the involvement of socially more sensitive areas such as genital, nail, face or hands and this can be seen as a limitation of the study.

Conclusions

Poor QoL is common among patients with CPP. Amongst, greater skin involvement irrespective of the body region involved, male gender, and being young are associated with poor QoL determined by both skin and disease specific tools. The outcome of this study highlights the importance of assessing the QoL in the clinical evaluation of patients with CPP and monitoring the progress. More attention should be given for patients who are young, male and those with severe disease.

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Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

Ethical approval

The study obtained ethical approval from the Ethical Review Committee of Faculty of Medicine, University of Ruhuna (Ref No. 15.02.2018 : 3.6) and is in accordance with the 1964 Helsinki declaration.

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