ORIGINAL ARTICLE

Quality of Life of Psoriatic Patients Assessed by SF-36 in Rajavithi Hospital

Onsiri Serirat, MD[1]

[1] Department of Medicine, Rajavithi Hospital, College of Medicine, Rangsit University, Bangkok, Thailand

Objective: To assess the quality of life (QOL) and related factors in psoriatic patients.

Materials and Methods: A cross-sectional study was conducted of 145 out-patients with psoriasis in Rajavithi Hospital. SF-36 mean scores were recorded for eight dimensions, physical function (PF), role limitations due to physical problems (RP), role limitations due to emotional problems (RE), vitality (VT); bodily pain (BP), general health (GH), social function (SF), and mental health (MH). The relationships between factors and QOL were explored using Pearson's correlation coefficient.

Results: The mean age was 46.27±16.25 years, and 55.2% were male. Average BMI was 25.40±5.45 kg/m^2, and the mean duration of psoriasis was 48 months. The median PASI score was 10, and 62% had a PASI score of 10 or less. The main areas of involvement were skin (77.2%), scalp (59.3%), and nails (44.8%). The QOL scores ranged from 35.67 to 72.00 with the highest score for bodily pain (72.00±21.86), followed by physical role (71.90±36.67), and emotional role (67.82±37.56). Female, smoking, underlying diseases, and area of involvement were associated with QOL.

Conclusion: Demographic, behavioral, and psoriasis-specific factors are associated with QOL.

Keywords: Psoriasis; Quality of life; SF-36

Received 2 May 2022 | Revised 4 November 2022 | Accepted 22 November 2022

J Med Assoc Thai 2023;106(3):244-50

Website: http://www.jmatonline.com

Psoriasis is an immune disorder that causes division of skin cell acceleration from approximately 211 hours to 72 hours, resulting in a thick and abnormal skin layer that can have various presentations. The most common plaque type is characterized by a thick red rash with precisely delineated edges covered with thick white scabs varying in size from a small spot to 20 cm. The most commonly affected areas are the elbows, knees, torso, back of the head, and shins. In addition, guttate psoriasis often occurs in children and adolescents, some of whom will have a history of respiratory infections or elevated anti-streptolysin O blood levels. Others may present with a rash (erythroderma type) with the appearance of pustules either over the whole body or only on the palms and soles of the feet (pustular type), and a red rash characteristically found in the moist areas of the body, such as in the armpits, under the breast, or groin (inverse type). Some patients also experience localized psoriasis symptoms, such as on the head or nails alone[1-3].

Psoriatic skin disease commonly occurs in all genders, races, and age ranges and is found in about 3% of the global population[4]. A high prevalence has been reported in adults aged 20 to 30 and 50 to 60 years, 75% of whom show symptoms before the age of forty. Besides skin problems, abnormal arthritis-like symptoms such as rheumatoid arthritis, osteoarthritis, and spondylitis are comorbidities in 5% of cases[5,6]. Moreover, diabetes, metabolic syndrome, stroke, myocarditis, and Crohn's disease are thought to be associated with the mechanisms that release inflammatory-related substances, interferon (IFN) as alpha, interleukin (IL)-23, IL-12, and IL-17, to stimulate the division of skin cells[7,8].

Psoriasis is a chronic incurable disease that occurs in many systems, and treatment should be maintained on a long-term basis. Although symptoms are not severe, the disease can have a significant impact on the sufferer's mind, quality of life (QOL), and relationships with family and friends. The treatment for controlling symptoms includes topical

Correspondence to:

Serirat O.

Department of Medicine, Rajavithi Hospital, 2 Phayathai Road, Rachathewi, Bangkok 10400, Thailand.

Phone: +66-2-2062900 ext. 60115

Email: onsirish@gmail.com

How to cite this article:

Serirat O. Quality of Life of Psoriatic Patients Assessed by SF-36 in Rajavithi Hospital. J Med Assoc Thai 2023;106:244-50.

DOI: 10.35755/jmedassocthai.2023.03.13799

drugs and ultraviolet radiation, such as PUVA, and narrow-band UVB, through oral vitamin A derivative. Chemotherapy drugs, such as methotrexate and many high-priced biologics, employed to suppress immune function, are used when other therapies cannot control the effects of the disease. The treatment prescribed depends on symptom severity, side effects, or underlying diseases that can affect the treatment. In addition, it has been discovered that psoriasis is associated with conditions other than the musculoskeletal system. Nowadays, people with psoriasis are more likely than those without the condition to develop diseases such as stroke, heart disease, diabetes, metabolic syndrome, and Crohn's disease[4].

Although psoriasis does not usually cause mortality, it has a dramatic adverse impact on QOL to the extent that it could be life-ruining and stigmatizing. It is now considered a systemic disease related to psychological, metabolic, arthritic, and cardiovascular comorbidities[9]. Studies have evaluated the disease's detrimental effects on sufferers' QOL and have found evidence that it can bring about a reduction in QOL equivalent to or worse than that of other chronic diseases such as diabetes mellitus and ischemic heart disease. Health-related QOL reflects patients' well-being, health status in chronic disease being mainly directed towards decreased physical symptoms. QOL instruments have been developed to measure QOL in terms of general health status, severity of skin disease, and its impact on psoriatic patients. The measurement of QOL in psoriasis usually involves both physical and mental health (MH) aspects[8,10].

The present study aimed to measure the QOL of psoriatic patients using the SF-36 and to determine factors associated with QOL.

Materials and Methods

Study design

A cross-sectional study was carried out in 2018 at Rajavithi Hospital, a tertiary care institute in central Bangkok, Thailand. Patients included were those aged above 18 years diagnosed with psoriasis that received treatment for it and were capable of communicating and understanding the SF-36 questionnaire. The sample size was calculated using the single mean formula based on the QOL scores from the previous study. One hundred forty-five patients in the dermatology outpatient's departments were recruited. Psoriatic patients without records of disease severity assessment were excluded. Written consent forms were obtained from all subjects, and the Ethics Committee of Rajavithi Hospital reviewed and approved the present study.

Psoriasis Area and Severity Index (PASI) was measured. The PASI scores convert assessment of the severity of skin disease and the area affected into a single score in the range 0 to 72, where 0 indicates no disease and 72 signifies maximal disease. Demographic data and medical history were recorded by a dermatologist, and patients underwent a physical examination, with diagnosis confirmed by clinical assessment. The PASI scores were assessed to classify psoriasis according to the severity of erythema, infiltration, scale, and area involved. In the present study, higher PASI scores indicated greater severity, with PASI values greater than 10 and 10 or less, signifying severe and moderate to mild disease, respectively.

For the purpose of comparison with the general population, the standard translated Thai version of the SF-36 questionnaire, validated, and retranslated by Leurmarnkul and Meetam (2005)[11], was used to assess QOL in these subjects. This form consists of 36 questions and measures eight dimensions of QOL with physical function (PF), role limitations due to physical problems (RP), role limitations due to emotional problems (RE), vitality (VT), bodily pain (BP), general health (GH), social function (SF), and mental health (MH). Previous studies had indicated that SF-36 is appropriate for use in research and clinical trials for patients with multiple conditions as well as those in the general population. The scores range from 0 to 100 for each of the eight dimensions, with a high score indicating healthy status[8] for example, higher bodily pain scores, which assess bodily pain intensity and its level of interference in normal activities during the last four weeks, indicate less pain[12]. For norm-based scores, any value above or below 50 can be considered above or below the population average health status respectively for that dimension.

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics, version 22.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were reported as number, percentage, mean ± standard deviation (SD), and median (minimum and maximum). The relationships between factors and QOL in each domain were determined using Point biserial correlation and Pearson's correlation. The independent t-test was performed to compare the QOLs according to disease

severity divided by PASI scores. A p-value of less than 0.05 was considered statistically significant.

Results

The mean age of the 145 psoriasis patients who completed the PASI and SF-36 questionnaire was 46.27±16.25 years. The majority (55.2%) were male, their average body mass index (BMI) was 25.40±5.45 kg/m², and 21.4% were smokers. The median duration of psoriasis was 48 months (range of 1 to 480 months), and a quarter of the patients had underlying diseases. The three most common underlying diseases were hypertension (78.4%), diabetes (35.1%), and dyslipidemia (21.6%). The median PASI score was 10 (range of 0 to 60), and around 62% had a PASI score of 10 or less. The area of skin involvement was mainly at the trunk, and extremities in 112 patients (77.2%), followed by the scalp (59.3%), and the nails (44.8%). The majority of patients were undergoing medication management. The characteristics of these psoriatic patients are shown in Table 1.

The mean scores and standard deviation of the eight dimensions of SF-36 are displayed in Table 2. The three highest scores were for bodily pain (72.00±21.86), followed by RP (71.90±36.67) and RE (67.82±37.56). In terms of bodily pain, it is analyzed by inverting the scores and meaning. The higher the score, the less or no discomfort. The two lowest scores were for VT (43.07±15.12) and MH (35.67±17.58). There was no difference when QOLs were analyzed according to disease severity divided by PASI scores, as shown in Table 2.

The factors associated with QOL are shown in Table 3. Pearson's correlation coefficients between the SF-36 data and the investigated factors showed significant correlations ranging between –0.255 and +0.200. Characteristic factors were significantly correlated with six SF-36 dimensions of PF, RP, RE, MH, bodily pain, and general health.

Females had a significant poorer QOL than males in terms of RP (r=0.200, p=0.016). Compared with their non-smoking counterparts, smokers had a significant inverse correlation with PF (r=–0.222, p=0.007), RP (r=–0.255, p=0.002), and RE (r=–0.196, p=0.018). However, smokers correlated more positively with MH than non-smokers (r=0.171, p=0.040). Compared with those without comorbidities, patients with underlying disease showed significantly greater impairment of QOL due to bodily pain (r=–0.172, p=0.039). A correlation between areas of involvement and QOL was also found, with a significant poorer QOL score for RE: skin with r=–0.174, p=0.037; scalp with r=–0.200, p=0.016; and nails with r=–0.238, p=0.004). In addition, two areas of involvement, the scalp (r=–0.174, p=0.037) and the nails (r=–0.192, p=0.021) caused inferior QOL in terms of general health. There was no significant correlation between QOL and age, BMI, PASI severity, duration of disease, or medication.

Table 1. Characteristics of psoriatic patients (n=145)

Characteristics	
Sex; n (%)	
Male	80 (55.2)
Female	65 (44.8)
Age (years); mean±SD	46.27±16.25
BMI (kg/m²); mean±SD	25.40±5.45
Smoking; n (%)	31 (21.4)
Duration (months); median (min-max)	48 (1 to 480)
Underlying disease; n (%)	
No	108 (74.5)
Yes	37 (25.5)
• Hypertension	29 (78.4)
• Diabetes	13 (35.1)
• Dyslipidemia	8 (21.6)
• Cardiovascular disease	4 (10.8)
• Psoriatic arthritis	2 (5.4)
• Obesity	1 (2.7)
PASI; n (%)	
≤10	89 (61.8)
>10	55 (38.2)
Median (min-max)	10 (0 to 60)
Areas of involvement; n (%)	
Skin	112 (77.2)
Scalp	86 (59.3)
Nails	65 (44.8)
Others	7 (4.8)
Medications & management; n (%)	
No	15 (10.00)
Yes	130 (90.00)
• Topical tar	70 (53.8)
• Topical steroid	120 (92.3)
• Conventional systemic therapy	22 (16.9)
• Topical vitamin D derivative	45 (34.6)
• Phototherapy	1 (0.8)
• Biologics	1 (0.8)

SD=standard deviation; BMI=body mass index; PASI=Psoriasis Area and Severity Index

Discussion

The present study aimed to evaluate QOL and identify the associations among factors and QOL

Table 2. Quality of life scores (QOLs)

Dimensions	Total; mean±SD	PASI ≤10; mean±SD	PASI >10; mean±SD	p-value
Physical functioning	61.55±30.24	62.92±29.16	60.18±31.74	0.597
Role limitations due to physical problems	71.90±36.67	75.28±35.25	65.91±38.60	0.137
Role limitations due to emotional problems	67.82±37.56	68.54±37.73	66.06±37.67	0.702
Energy/fatigue	43.07±15.12	44.44±15.18	40.91±15.03	0.176
Emotional well-being	35.67±17.58	35.69±16.48	35.85±19.47	0.956
Social functioning	51.63±17.57	52.17±16.24	50.79±19.80	0.649
Bodily Pain	72.00±21.86	74.04±21.66	68.82±22.17	0.165
General mental health	52.67±19.45	53.54±20.26	51.50±18.29	0.543

SD=standard deviation; PASI=Psoriasis Area and Severity Index

Table 3. Correlation between quality of life scores and characteristics factors

Factors	Physical functioning	Physical role	Emotional role	Vitality	Mental health	Social functioning	Bodily pain	General health
Female	0.027	0.200 (p=0.016)*	0.108	0.042	0.030	–0.050	–0.049	0.024
Age	0.013	–0.011	0.012	–0.127	–0.163	0.008	0.039	0.122
BMI	0.009	–0.107	0.123	–0.098	–0.044	0.054	–0.009	–0.003
Smoking	–0.222 (p=0.007)*	–0.255 (p=0.002)*	–0.196 (p=0.018)*	0.151	0.171 (p=0.040)*	–0.094	0.016	–0.059
Duration	–0.128	–0.067	–0.094	–0.082	–0.091	–0.111	–0.069	0.078
Underlying disease	–0.022	–0.048	–0.103	0.044	–0.011	0.050	–0.172 (p=0.039)*	–0.162
PASI+	–0.040	–0.092	–0.068	0.008	0.091	–0.001	–0.077	–0.129
Skin	–0.062	–0.159	–0.174 (p=0.037)*	0.018	–0.010	–0.117	–0.033	–0.078
Scalp	–0.023	–0.090	–0.200 (p=0.016)*	0.029	0.074	0.005	–0.025	–0.174 (p=0.037)*
Nails	–0.063	–0.132	–0.238 (p=0.004)*	0.028	0.027	–0.060	–0.088	–0.192 (p=0.021)*
Medications	0.005	–0.064	–0.131	0.036	0.063	–0.016	0.104	–0.006

BMI=body mass index; PASI=Psoriasis Area and Severity Index

* Significant at $p<0.05$ with Point biserial correlation, Pearson's correlation

in psoriatic patients with different demographics, lifestyles, and clinical characteristics.

The subjects' SF-36 scores decreased in all eight dimensions, with average QOL scores ranging from 35 to 72. Studies have demonstrated the deleterious effects of psoriasis on QOL. Being a chronic disease, it affects both patients and their family members destined to face a wide range of pressure in their lives in terms of psychological and social factors as well as interpersonal relationships and other issues related to the practical care of the patients[13-15]. The present study agreed with a survey performed by Hayama in a cross-sectional study in Japan, which revealed the QOL of psoriatic patients was impaired in comparison with that of the standard Japanese population[13]. In addition, the present study also indicated that the QOL scores of psoriatic patients was especially lower for VT and MH.

Among the present study subjects with psoriasis, Pearson correlation showed that smoking was associated with poorer PF, as well as physical and emotional roles. Studies of the associations between smoking and psoriatic patients are controversial, showing both inverse and positive correlations between smoking and the development of psoriasis[16-18]. Previous studies have suggested that smoking may trigger the development of psoriasis as a result of oxidative inflammatory and genetic mechanisms[19]. It is known that smoking harms almost every organ in the body and has a detrimental effect on physical activities and exercise, as smokers normally have less endurance and poorer physical performance, leading to muscle burning and fatigue. Psoriatic patients who smoke tend to have emotional problems, be less inclined to work, put in fewer working hours, experience employment-related

difficulties, and expend more time and effort on tasks.

Additionally, there is a possible reverse causality that result in patients who smoke refusing to participate in exercise and other physical activities because of itchiness. Psoriasis also leads to patients reducing their range and frequency of movement because of concerns about their ailment being exposed. Thus, smoking reduces PF, physical role, and emotional role in psoriatic patients.

In contrast, smoking was positively correlated with MH in the present study. Psychological disturbances in psoriasis sufferers include perception of stigmatization and depression. To alleviate these feelings, some people revert to smoking as 'self-medication' for stress and depression, as nicotine creates an immediate sense of relaxation. Smokers believe that nicotine reduces stress and anxiety. However, this feeling may bring only temporary calmness. This finding had a positive effect on the psoriatic patients in the current study. In a large cohort study in the U.K., smoking was positively associated with psoriatic arthritis (PsA) risk in the general population but negatively associated with psoriasis. A causal intermediate variable of psoriasis may reverse the association between smoking and PsA, and a potential explanation is the smoking paradox regarding the risk of PsA among psoriasis patients[16].

Females had a significant poorer QOL than males in terms of RP. Previous reports by other investigators have confirmed that the impact of psoriatic patients might vary with gender[20,21], as women with psoriasis are more likely than men to experience strong negative feelings toward their bodies. Other reports have revealed that patients with PASI of 10 or more fear that people will react with aversion to their skin disease, therefore, they avoid using public recreation areas such as swimming pools and fitness centers[22]. As women tend to be more self-conscious than men about their physical appearance and good looks, there is also a negative effect on their physical strength, especially in the case of those with psoriasis. Consequently, despite the recommendation that exercise is essential for physical strength, psoriatic patients tend to participate in minimal physical activity.

In general, psoriasis can negatively influence a patient's QOL, and the severity of this impact can vary according to the location of lesions, found to be a determinant factor of QOL in previous studies. More serious deterioration in QOL has been revealed in people with lesions on the face and scalp, because of their clear visibility[23]. In the present study, skin, scalp, and nail involvement negatively affected patients' role limitation due to emotional problems. In addition, scalp and nail involvements were negatively associated with general health. One explanation is that the patients had come to terms with the disease. Most individuals were middle-aged adults, and they had learned to live with the condition. A better understanding of the disease may lead to a few emotional and general health problems. However, the accuracy of this apparently credible explanation needs to be explored further. The present study's findings are consistent with the results reported by Lin et al. (2011)[24] in a study of 480 Taiwanese patients, which demonstrated that initial lesions on the nails had a significant negative impact on patients' QOL. Other studies have shown that nail involvement has a greater effect on QOL than that of any other region because of its visibility, especially during manual activity[25].

According to a study by Menter et al. (2018)[26], the most common comorbidities of psoriatic patients are psoriatic arthritis, cardiovascular disease, metabolic syndrome, excess weight or obesity, inflammatory bowel disease, and depression. The current study showed that underlying diseases were inversely associated with bodily pain. Most of the subjects in the present study had mild or moderate symptoms in up to 60%. In addition, the SF-36 questionnaire asked about only one month's pain duration, during which the patients may have been able to control the disease well.

Age, BMI, PASI score, duration of disease, and medication were not associated with QOL in the present study. This was not consistent with the previous research by Sampogna et al. (2006)[10], which indicated that QOL was significantly more impaired in the older group in his research. Several studies have revealed an association between psoriasis and obesity[27,28], however, the average BMI of patients in the current study showed that they were only slightly overweight at 25 kg/m², and there was no association between BMI and QOL. Sendrasoa et al. (2020)[29] reported that the higher the PASI, the greater the deterioration in QOL, however, there was no significant association between PASI and QOL in the current study. These variations in results may be attributable to differences in the patients' backgrounds, including cultural, ethnics, socioeconomic or other factors. In addition, the QOL was measured during the patient's routine treatment. In the future, a prospective study should be performed to evaluate the relationship between PASI and QOL.

There are many modalities in the measurement

of QOL. The SF-36, a general condition of QOL that covers the key QOL concepts, is used and may be compared to the QOL with other diseases in internal medicine. The study of QOL and factors related to the QOL of Psoriatic patients is still limited. Therefore, the findings are used as a database for patient care and to promote patient health to improve psoriasis patients' QOL.

There were limitations in the present study, as its cross-sectional nature may not allow for causal interferences regarding psoriasis severity and QOL. Some responses to the QOL questionnaire may interfere with the results of the present study. Furthermore, its small sample size, together with the fact that it was a single-setting study with short duration, means that it is not representative of the entire population. A prospective study is needed to examine the causal relationships of these findings. Socioeconomic status such as educational levels and income may have affected the QOL, and these were not examined in the present study. Despite the aforementioned limitations, the present study provides results on the QOL in psoriasis patients in Thailand that could be of concern for further research and treatment directions.

In conclusion, demographic, behavioral, and specific disease factors are associated with QOL. The use of dermatology-specific and QOL questionnaires are warranted to better understand the impact of psoriasis on sufferers' lives. The study provides evidence that the SF-36 can be used in observational studies for psoriatic patients in Thailand.

Acknowledgment

This study was supported by a Rajavithi Hospital research fund. The author is grateful to all participants who gave their support throughout this study and would like to thank staff in the Medical Research Division, Rajavithi Hospital, for their assistance in data analyses and manuscript preparation.

Conflicts of interest

The author reports no conflicts of interest in this work.

References

1. Schön MP, Boehncke WH. Psoriasis. N Engl J Med 2005;352:1899-912.
2. Nestle FO, Kaplan DH, Barker J. Psoriasis. N Engl J Med 2009;361:496-509.
3. Naldi L, Griffiths CE. Traditional therapies in the management of moderate to severe chronic plaque psoriasis: an assessment of the benefits and risks. Br J Dermatol 2005;152:597-615.
4. Kim N, Thrash B, Menter A. Comorbidities in psoriasis patients. Semin Cutan Med Surg 2010;29:10-5.
5. Mrowietz U, Kragballe K, Nast A, Reich K. Strategies for improving the quality of care in psoriasis with the use of treatment goals--a report on an implementation meeting. J Eur Acad Dermatol Venereol 2011;25 Suppl 3:1-13.
6. Strohal R, Kirby B, Puig L, Girolomoni G, Kragballe K, Luger T, et al. Psoriasis beyond the skin: an expert group consensus on the management of psoriatic arthritis and common co-morbidities in patients with moderate-to-severe psoriasis. J Eur Acad Dermatol Venereol 2014;28:1661-9.
7. de Korte J, Sprangers MA, Mombers FM, Bos JD. Quality of life in patients with psoriasis: a systematic literature review. J Investig Dermatol Symp Proc 2004;9:140-7.
8. Sampogna F, Tabolli S, Söderfeldt B, Axtelius B, Aparo U, Abeni D. Measuring quality of life of patients with different clinical types of psoriasis using the SF-36. Br J Dermatol 2006;154:844-9.
9. Stern RS, Nijsten T, Feldman SR, Margolis DJ, Rolstad T. Psoriasis is common, carries a substantial burden even when not extensive, and is associated with widespread treatment dissatisfaction. J Investig Dermatol Symp Proc 2004;9:136-9.
10. Sampogna F, Chren MM, Melchi CF, Pasquini P, Tabolli S, Abeni D. Age, gender, quality of life and psychological distress in patients hospitalized with psoriasis. Br J Dermatol 2006;154:325-31.
11. Leurmarnkul W, Meetam P. Properties testing of the retranslated SF-36 (Thai Version). Thai J Pharm Sci 2005:29:69-88.
12. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473-83.
13. Hayama K, Fujita H, Iwatsuki K, Terui T. Improved quality of life of patients with generalized pustular psoriasis in Japan: A cross-sectional survey. J Dermatol 2021;48:203-6.
14. Leung YY, Ho KW, Zhu TY, Tam LS, Kun EW, Li EK. Testing scaling assumptions, reliability and validity of medical outcomes study short-form 36 health survey in psoriatic arthritis. Rheumatology (Oxford) 2010;49:1495-501.
15. Ng CY, Yang YW, Liu SH, Lu JF, Yang LC, Yang CH, et al. SF-36 healty survey on psoriasis quality-of-life: a study of 414 Taiwanese patients. J Dermatol 2015;42:159-65.
16. Nguyen UDT, Zhang Y, Lu N, Louie-Gao Q, Niu J, Ogdie A, et al. Smoking paradox in the development of psoriatic arthritis among patients with psoriasis: a population-based study. Ann Rheum Dis 2018;77:119-23.
17. Li W, Han J, Qureshi AA. Smoking and risk of incident

psoriatic arthritis in US women. Ann Rheum Dis 2012;71:804-8.
18. Eder L, Shanmugarajah S, Thavaneswaran A, Chandran V, Rosen CF, Cook RJ, et al. The association between smoking and the development of psoriatic arthritis among psoriasis patients. Ann Rheum Dis 2012;71:219-24.
19. Armstrong AW, Armstrong EJ, Fuller EN, Sockolov ME, Voyles SV. Smoking and pathogenesis of psoriasis: a review of oxidative, inflammatory and genetic mechanisms. Br J Dermatol 2011;165:1162-8.
20. Janowski K, Steuden S, Pietrzak A, Krasowska D, Kaczmarek L, Gradus I, et al. Social support and adaptation to the disease in men and women with psoriasis. Arch Dermatol Res 2012;304:421-32.
21. Finzi A, Colombo D, Caputo A, Andreassi L, Chimenti S, Vena G, et al. Psychological distress and coping strategies in patients with psoriasis: the PSYCHAE Study. J Eur Acad Dermatol Venereol 2007;21:1161-9.
22. Khoury LR, Danielsen PL, Skiveren J. Body image altered by psoriasis. A study based on individual interviews and a model for body image. J Dermatolog Treat 2014;25:2-7.
23. Kragballe K, Menter A, Lebwohl M, Tebbey PW, van de Kerkhof PC. Long-term management of scalp psoriasis: perspectives from the International Psoriasis Council. J Dermatolog Treat 2013;24:188-92.
24. Lin TY, See LC, Shen YM, Liang CY, Chang HN, Lin YK. Quality of life in patients with psoriasis in northern Taiwan. Chang Gung Med J 2011;34:186-96.
25. Blome C, Augustin M, Klein TM. Nail psoriasis and quality-of-life measurement in clinical trials: Call for the use of nail-specific instruments. Am J Clin Dermatol 2021;22:747-55.
26. Menter MA, Armstrong AW, Gordon KB, Wu JJ. Common and not-so-common comorbidities of psoriasis. Semin Cutan Med Surg 2018;37(2S):S48-51.
27. Jensen P, Skov L. Psoriasis and Obesity. Dermatology 2016;232:633-9.
28. Naldi L, Chatenoud L, Linder D, Belloni Fortina A, Peserico A, Virgili AR, et al. Cigarette smoking, body mass index, and stressful life events as risk factors for psoriasis: results from an Italian case-control study. J Invest Dermatol 2005;125:61-7.
29. Sendrasoa FA, Razanakoto NH, Ratovonjanahary V, Raharolahy O, Ranaivo IM, Andrianarison M, et al. Quality of life in patients with psoriasis seen in the department of dermatology, Antananarivo, Madagascar. Biomed Res Int 2020;2020:9292163.