RESEARCH ARTICLE

Quality of life measurement alteration among Vietnamese: Impact and treatment benefit related to eczema

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Abstract

Objective: Health-related quality of life is an important factor when assessing the impairment of a disease and the benefit of treatment, especially eczema-a chronic dermatologic condition. The objective of this study is to express the distinction between quality of life and clinical characteristics of Vietnamese eczema patients pre- and post-treatment by using repeated measurement.

Methods: A before-and-after, prevalence-based study was conducted with a minimum sample size of 132 patients in a dermatology hospital in southern Vietnam. Two domains of SCORAD were applied to demonstrate clinical characteristics while DLQI and EQ-5D-5L were used to identify the impact on patients' quality of life. The difference and correlation between variables were used to express the benefit of treatment through the bootstrapping method, the Spearman test, and multivariable regression.

Results: A total of 136 respondents were eligible for this study design, with an average age of 36.9±15.9. The effect of eczema on participants' quality of life was demonstrated through a DLQI mean score of 7.0 (6.2-7.8). There was a correlation between clinical factors, DLQI, and EQ-5D results (p-value < 0.01). After the post-treatment evaluation, the DLQI score decreased by 3.7 points, and a multivariable model reflected the effect levels of symptoms on patient improvement.

Conclusion: Eczema led to a negative effect on patients in many aspects of their lives. Reducing subjective symptoms significantly enhances the quality of life of eczema patients.

Keywords: Atopic dermatitis, Before after study, DLQI, EQ-5D, Vietnam. (JPMA 69: S-49 (Suppl. 2); 2019)

Introduction

Eczema is a term used to describe the condition wherein the skin becomes red, inflammatory, and tremendously pruritic. It is often interchanged with "atopic dermatitis" (AD) because atopic dermatitis is the most common and severe form among several types of eczema.[1,2] Allergic conditions, genetics, impaired skin barrier function, and environment have been described as risk factors of eczema.[3] Eczema is more common in children than in adults; the condition persists into adulthood for 10-30% of patients who are diagnosed as children. The prevalence of AD has increased in the last few decades: 1-3% of adults worldwide live with this condition.[3,4] In a study in China (2014) with 682 AD patients, 59.7% had adult-onset AD, demonstrating that there should be more awareness in late-onset AD.[5] There have been no AD epidemiological studies in Vietnam, but according to the Society of Asthma, Allergy, and Clinical Immunology Ho Chi Minh City (HCMC), the percentage of eczema-related medical visits in 2014 in the HCMC Hospital of Dermato-Venereology — one of the most well-known dermatology-specific hospitals in Vietnam — was 34%.[6]

Although eczema is a non-contagious disease, its chronic relapse creates consequences for patients, families, the healthcare system, and society. The National Eczema Organization, a United States-based patient advocacy group, shared results of a survey conducted among 505 Americans in 2016: 20% reported that their moderate-to-severe AD interfered with their ability to maintain employment, and 49% said that AD negatively impacted their sleep.[7] Health-related quality of life is significantly undermined by a dermatological disease like eczema. The severity is contingent on the extent of affected body surface area, especially affected skin not typically covered by clothing that could make patients unconfident or uncomfortable when they communicate with others.[8] One study found that the impairment resulting from eczema was more than the impairment from diabetes and hypertension.[9] In some countries, eczema was one of the most influential occupational diseases[10,11] that, for eczema patients, acts as an obstacle to completing their work. Currently, in Vietnam, treatment of eczema will follow a prescription program consisting of oral and topical medication; doctors determine which medications

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to prescribe according to the severity, pruritus, and type of eczema (acute or chronic).[12] Although research has not been done in Vietnam to explain the cost burden of eczema, many studies in other countries provide figures to help explain the impact of eczema on the economy. For example, in Spain, the total cost of the nearly 6,200 eczema patients reached €9.3 million (Euro), with 75.5% attributed to healthcare costs and 24.5% to loss of productivity.[13] In Italy, it was figured that having AD cost one patient €420 per month, with loss of productivity accounting for 43.7% of that cost.[14] Therefore, it is necessary to identify if following a prescription regimen could give patients advantages for both their physical and mental health, as well as their daily lifestyle. This study was designed to reflect the distinction between quality of life and clinical symptoms pre- and post- treatment based on comparative and statistical values.

Patients and Methods

A pre-post with repeated measurement and prevalence-based study was designed to assess the clinical characteristics and quality of life index and then compare with the corresponding figures collected after a one-month treatment. The study was conducted between July 2018 and September 2018 in the HCMC Hospital of Dermato-Venereology, a leading hospital of dermatology in HCMC and provinces in the south of Vietnam.

This study was targeted at outpatients of the HCMC Hospital of Dermato-Venereology with the following eligibility conditions: age $\geq$ 18 years old, not pregnant, diagnosis of eczema by doctors according to ICD-10 (the 10th revision of the International Statistical Classification of Diseases and Related Health Problems), having treatment following the prescription (medications with doses and time period), and voluntary participation in this study. The patients who did not agree to purchase the medications in the prescription or not participate in the one-month follow up were excluded. The study population size was calculated following the formula below.[15,16]

$$N = \frac{(Z_\alpha + Z_\beta)^2 \, S_\triangle^2}{ES^2}$$

With $\alpha = 0.05$ and $\beta = 0.1$, standard normal deviations for α and β are 1.96 and 1.282, respectively. To assess $S_\triangle$ (standard deviation of the change in the outcome) and ES (effect size), a pilot survey was conducted with 30 patients. S (standard deviation of the outcome in the population) and r (within-subject correlation of the outcome) were evaluated based on DLQI scores of 3.532 and 0.627, respectively. Then, $S_\triangle$ was computed according to the formula $S_\triangle^2 = 2S^2 (1 - r_{within}) = 3.050$[17] and ES was assigned as 0.862. With the result of N = 132 respondents, 145 patients were interviewed to ensure the required quantity.

A questionnaire was constructed with three parts: demographical characteristics, clinical dermatology status, and quality of life. General information about age, gender, jobs, and addresses of included patients was collected. The survey also checked whether patients had any risk factors for eczema such as allergens, exposure to tobacco smoke, comorbidities (liver disease, allergic rhinitis, sinusitis, asthma, and other dermatological diseases), and family history. Scoring of atopic dermatitis (SCORAD) is a common tool with three domains to evaluate the extent of eczema and identify the effectiveness of the treatment by dermatologists.[18] The position that eczema symptoms express and the rule of 9 are to calculate area score (domain A). Six intensity items (redness, swelling, oozing/crusting, scratch marks, lichenification, and dryness) are assessed on a four-point scale of severity (0 = none, 1 = mild, 2 = moderate, 3 = severe) (domain B). Subjective symptoms (itchiness and sleeplessness) were scored using a scale where 0 is none and 10 is the worst they can imagine (domain C). In the HCMC Hospital of Dermato-Venereology, doctors do not define the severity stages of eczema like domain B; they indicate the medications depending on the pruritus, broad level on patients' bodies, and the effect of eczema on patients' quality of life. It is allowed to use some of the domains separately instead of the whole SCORAD questionnaire.[19] Therefore, the A and C domains were interviewed in this study design, but patients were also asked 6 items from the B domain regarding the presence of those eczema symptoms.

Quality of life indexes were collected by two usual and standardized measurements, namely the Dermatology Life of Quality Index (DLQI) and EQ-5D (European Quality of Life-5 Dimensions) with 5 levels (0 = none, 5 = extreme problems) in Vietnamese. The DLQI is a ten-question questionnaire which is specific to dermatological diseases to give more accurate reflections about the impact of eczema on health-related quality of life, while EQ-5D, a widely applicable tool for the majority of health conditions, was expected to describe patients' generic health status to easily compare with results from patients with other diseases. Each DLQI question has a maximum of three points, where 0 is not relevant or not impaired at all, and 3 is very much impaired. The DLQI score summarizes ten certain items and indicates the status of eczema's effect on patients' life: 0-1 is none (range 1), 2-5 is small (range 2), 6-10 is moderate (range 3), 11-20 is very

large (range 4) and 21-30 is extremely large (range 5). EQ-5D, with five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), interprets the health state with a 5-digit number outcome which could perform the utility index based on crosswalk value sets of Vietnam.[20] The EQ visual analog scale (VAS) is a quantitative measure from 0 to 100 (100 is best imaginable state) for respondent to self-compute their health, which makes sense in psychophysics.

The study had approval from the HCMC Hospital of Dermato-Venereology. Participation in the research must come with consent by patients currently in treatment for eczema at this study site.

The variables of socio-demographic, clinical, and quality of life characteristics were displayed in the paired data design (initially and after one month of treatment) by using descriptive statistics. Particularly, it is expressed in the form of mean and standard deviation for the continuous and proportion for the categorical. The bootstrapping method was applied with 1,000 replicates if the continuous did not have normal distribution to calculate the average and 95% confidence interval (CI). A multivariable regression was estimated to not only show the association between the DLQI score and the EQ-5D adjusted by SCORAD, VAS, and demographical variables, but also determine the effect of the variables on the change of quality of life index. The most appropriate model was chosen from the results of Bayesian model averaging. To emphasize the benefit of treatment, the bootstrapping method (1,000 replications) was used to demonstrate the changes in clinical and quality of life indexes before, between, and after treatment due to the skewed distribution. All figures were added and analyzed by the software R version 3.4.3.

Results

A total of 136 voluntary patients were eligible according to the study criteria. Table-1 summarizes demographical characteristics of respondents with an average age of patients being 36.9±15.9 years. Most of patients had eczema on their heads, necks, and upper and lower limbs with erythema symptoms (63.2%) (Table-2).

Table-1 shows the Demographical factors of eligible patients [N = 136].

Table-2 portrays the Clinical evaluation of eczema patients following a one-month treatment period.

According to DLQI answers, eczema affected most of patients on a small or moderate level (Figure-1), and the majority of patients reported their eczema to be itchy, sore, painful, or stinging (89%) (Table-3). Similarly, EQ-5D results showed that more than 90% of patients complained about pain or discomfort because of eczema (Figure-1). The mean EQ-5D utility and VAS were 0.70 (0.66-0.74) and 74.93 (72.22-77.42), respectively.

Table-1: Demographical factors of eligible patients [N = 136].

Characteristics	N	%
Age		
Mean (SD)	36.9 (15.9)	
Gender		
Male	61	44.9
Female	75	55.1
Locality		
Urban	121	88.8
Rural	15	11.2
Allergy		
Food	36	26.6
Dust	46	33.6
Soap	34	24.8
Fever	13	9.3
Medication	13	9.3
Weather	34	24.8
Smoke		
Smoking	27	19.6
Not smoking but exposed to smoke	75	55.1
Comorbidity		
Liver disease	13	9.3
Allergic rhinitis	35	25.7
Sinusitis	30	22
Asthma	2	1.4
Other dermatology diseases	8	6.1
Genetics		
Yes	24	17.8
No	112	82.2
Onset time		
More than 3 months ago	43	31.8
Less than 3 months ago	93	68.2
Getting any treatment before		
No	35	25.7
Yes	101	74.3

Notes: SD: standard deviation.

Effect of eczema on patients by DLQI assessment is shown in Table-3.

Figure-1 shows Modification of the response for the EQ-5D question and the DLQI range after a one-month treatment.

The significant correlation between quality of life and clinical index was performed by Rho in the Spearman method (p-value < 0.01) in Table 4 and confirmed by multivariable regression with R-squared 0.62 and p-value < 0.01.

Table-2 Clinical evaluation of eczema patients following a one-month treatment period.

Characteristics	Initially		After one-month treatment	
	N	%	N	%
Area				
Head and neck	71	52.2	50	36.8
Upper limbs	76	55.9	53	39
Lower limbs	59	43.4	42	30.9
Anterior trunk	28	20.6	18	13.2
Back	28	20.6	18	13.2
Genitals	18	13.2	3	2.2
Mean (95% CI)	3.3 (2.7-4.0)	2.1 (1.6-2.8)		
Intensity				
Erythema	86	63.2	28	20.6
Dryness	72	52.9	53	39
Lichenification	35	25.7	16	11.8
Vesiculation	49	36	30	22.1
Oedema	6	4.4	2	1.5
Fissures	12	8.8	8	5.9
Oozing	19	14	12	8.8
Subjective symptoms				
Mean (95% CI)	7.6 (6.7-8.6)		3.8 (3.1-4.7)	
Total SCORAD score				
Mean (95% CI)	10.9 (9.7-12.3)		6.0 (4.8-7.2)	

Notes: Mean (95% CI) was calculated by Bootstrap method.
CI: Confidence Interval.

Table-3: Effect of eczema on patients by DLQI assessment.

DLQI Questionnaire	Initially (rate)				After one-month treatment (rate)			
	0	1	2	3	0	1	2	3
Itchy, sore, painful or stinging	0.11	0.19	0.30	0.40	0.40	0.30	0.22	0.08
Embarrassed or self-conscious	0.48	0.20	0.29	0.03	0.67	0.15	0.15	0.03
Interfered with your shopping or looking after your home or garden	0.66	0.11	0.20	0.03	0.83	0.14	0.03	0.00
Influenced the clothes	0.70	0.10	0.18	0.02	0.87	0.08	0.03	0.02
Affected any social or leisure activities	0.67	0.13	0.18	0.03	0.82	0.07	0.11	0.00
Difficult to do any sport	0.85	0.04	0.07	0.04	0.94	0.02	0.03	0.01
Prevented from working or studying	0.49	0.28	0.13	0.10	0.82	0.10	0.03	0.05
Created problems with your partner	0.79	0.14	0.06	0.01	0.90	0.10	0.00	0.00
Caused any sexual difficulties	0.83	0.08	0.08	0.01	0.98	0.01	0.01	0.00
Having problem with treatment	0.54	0.21	0.20	0.04	0.71	0.15	0.09	0.05
DLQI Total Score [Mean (95% CI)]		7.0 (6.2-7.8)				3.3 (2.7-3.8)		

Notes: 0 = Not at all; 1= A little; 2= A lot; 3= Very much; CI: Confidence Interval.

Table-4: Correlation between clinical and quality of life values.

	Assessed after treatment		
SCORAD	0.77	-0.73	-0.61
0.56	DLQI	-0.73	-0.55
-0.33	-0.53	EQ5D utility	0.64
-0.30	-0.48	0.21	VAS
Assessed initially			

DLQI score = 0.22 x SCORAD - 6.9 x utility index - 0.12 x VAS + 18.36.

Correlation between clinical and quality of life values are presented in Table-4.

The data assessed during the post-treatment stage defined the effectiveness of treatment through the clinical and quality of life data which were shown to be changing in a positive way for patients (Table-2 and

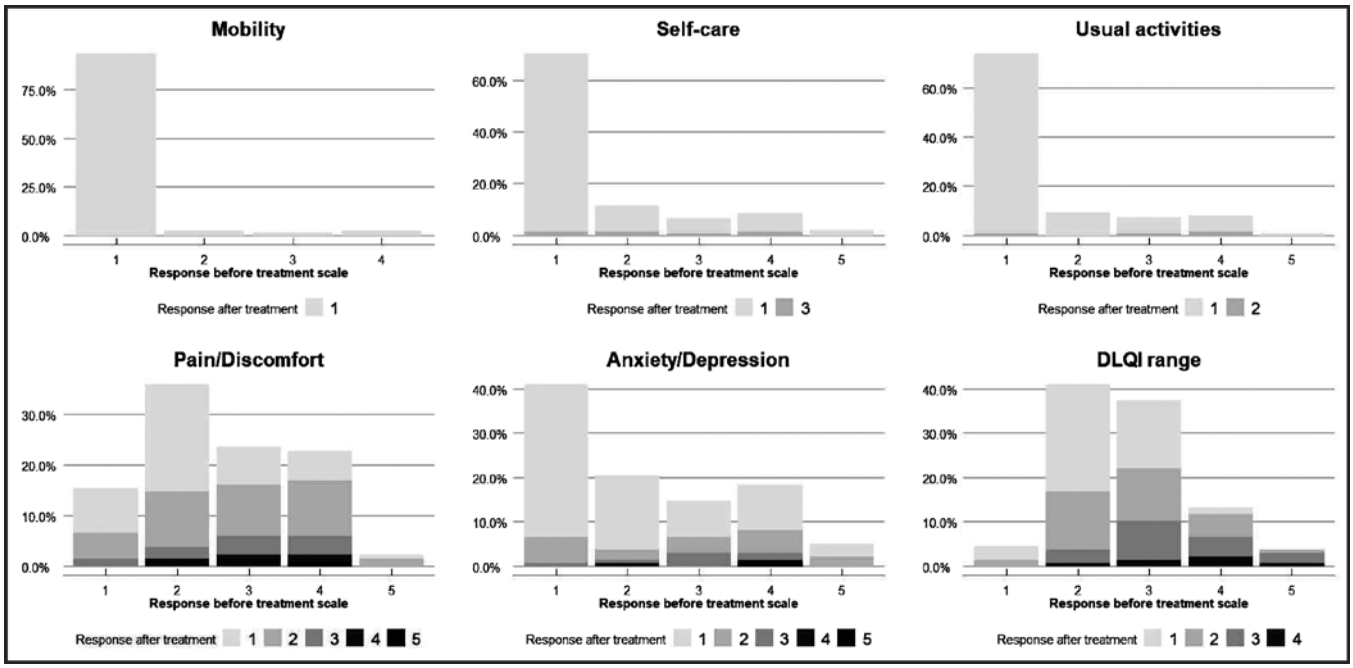

Figure-1: Modification of the response for the EQ-5D question and the DLQI range after a one-month treatment.

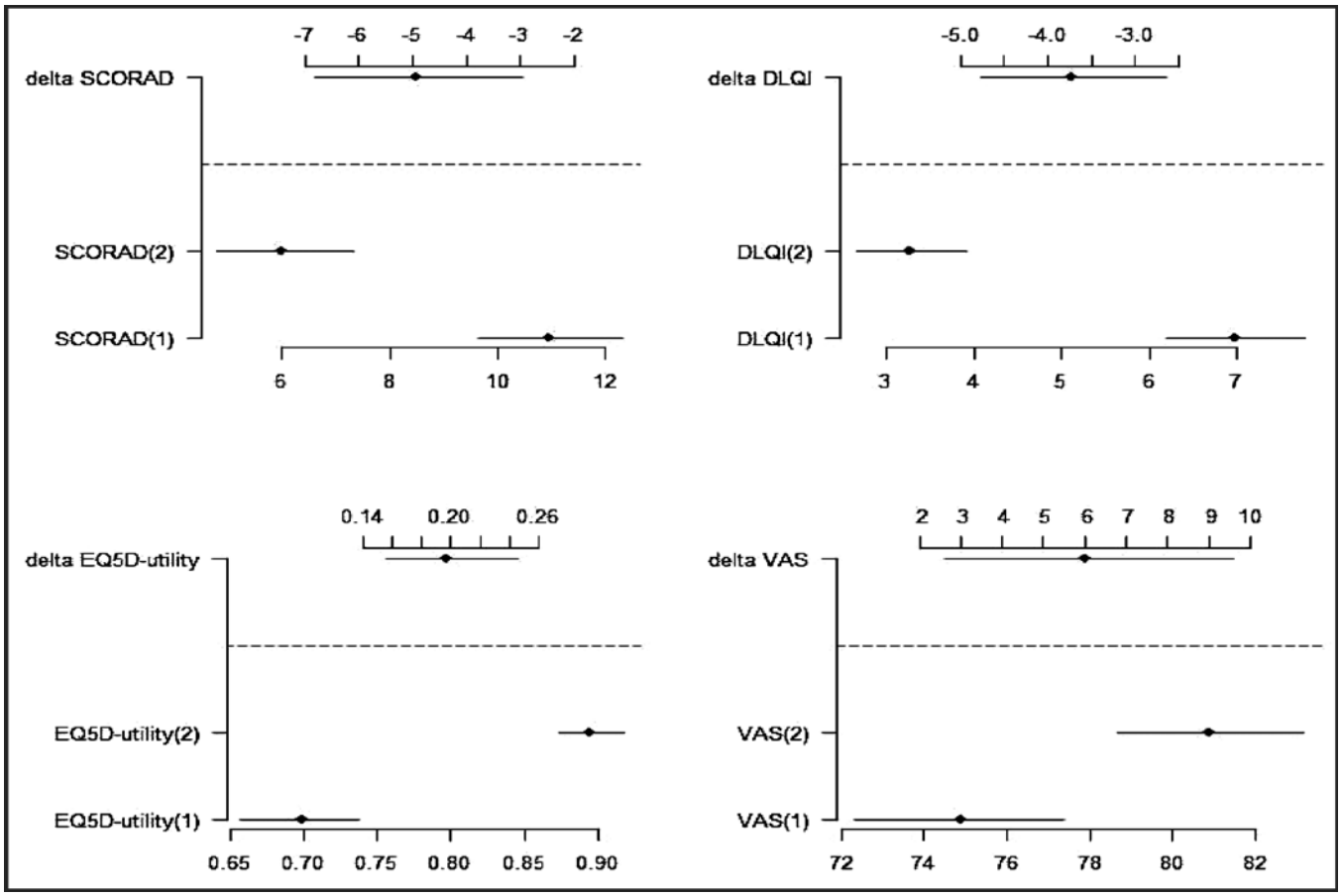

Figure-2: Benefit assessment of treatment by mean differences regarding clinical and quality of life value [Notes: (1) Initially, (2) After one-month treatment].

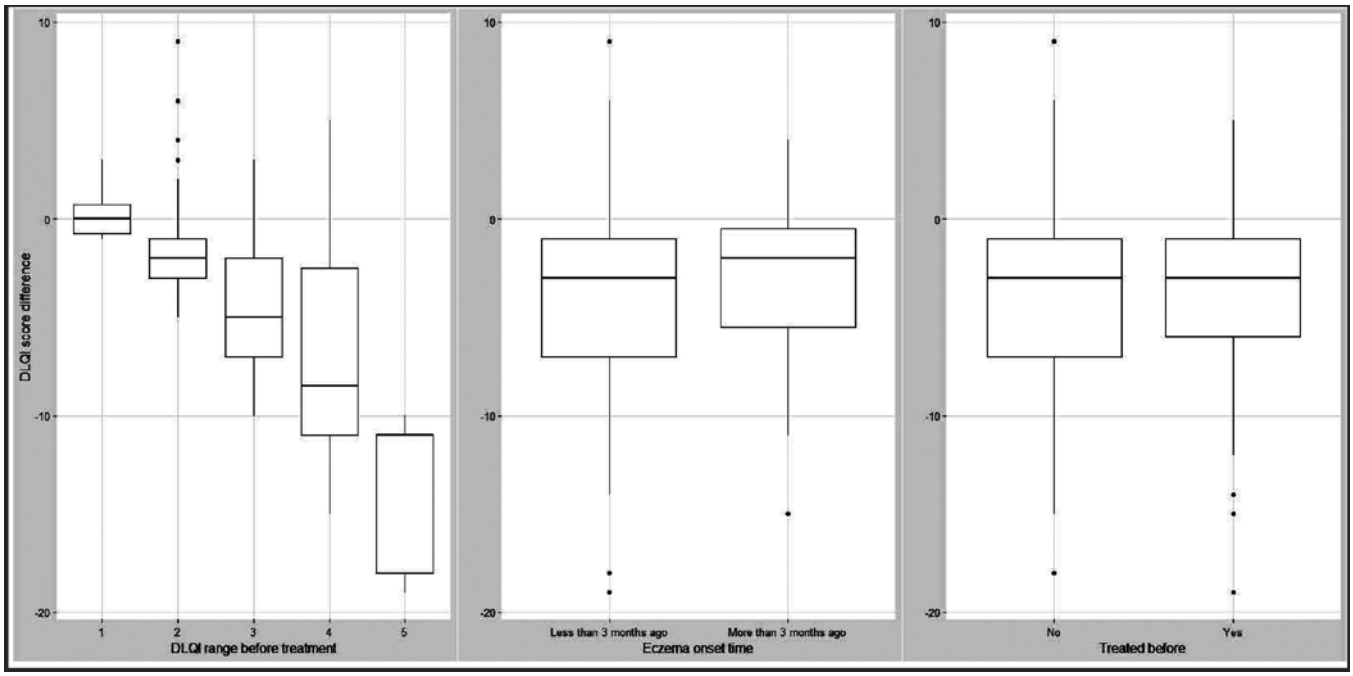

Figure-3: Alteration of DLQI score by treatment-related categorical variables.

Table-3). With the bootstrapping method, significant differences between pre- and post-treatment were demonstrated by the error bar in Figure-2. Figure-1 also demonstrates the interchange of selection the answer for EQ-5D questionnaire and DLQI range. Nearly 100% of patients had no issues with mobility, self-care, and usual activity after receiving treatment. Approximately 7% of patients' eczema became uncomfortable after treatment, although they had not felt it before; patients who became more worried about their disease accounted for 11.0%. Out of the 136 patients, there were 9 cases of eczema having a greater impact on patients' quality of life post treatment based on the DLQI score classification. The change of the DLQI score was associated with subjective symptoms and the DLQI score before treatment (DLQI score difference = 0.183 x C-domain score -0.77 x DLQI score pre-treatment; R-square = 0.53 and p-value < 0.01).

Figure-2 shows the benefit assessment of treatment by mean differences regarding clinical and quality of life value [Notes: (1) Initially, (2) After one-month treatment].

Figure-3 displays the difference in DLQI score alteration between DLQI ranges pre-treatment, but there was no distinction among patients having dissimilar eczema onset times and receiving any previous treatment.

Alteration of DLQI score by treatment-related categorical variables can be seen in Figure-3.

Discussion

As mentioned above, this study focused on the area of respondents' subjective eczema symptoms. Therefore, we cannot use the classification instruction from the authors of SCORAD. A Danish study[21] researched in population with age 31.3±12.0 summarized that mean itchiness and sleeplessness VAS were correspondingly 5.29 and 3.44. These figures were similar to the outcome of this study. The eczema impact on the quality of life of patients in this study (shown by the DLQI score of 7.0) was nearly the same as those in the Augustin et al study (mean DLQI = 6.7).[22] However, this outcome was lower than other studies, including Holm et al[21] and Blome et al[23] studies with mean DLQI scores of 9.79 and 11.3, respectively. Many studies focused on hand eczema[10,14,22,23] because of its common occurrence; some respondents in this study stated that eczema symptoms on their hands interfered with their ability to work, especially patients who were frequently exposed to the chemicals such as housewives (soap), manual laborers, manicurists, hairdressers, and so on. However, eczema on the surface of the body not covered by clothing — principally, on the face — prevented patients from doing jobs that required them to interact with many new people. Sweating was also said to be an issue for eczema patients due to the resulting outbreak of itching symptoms, which significantly affected farmers, drivers, laborers, and other similar professions. However, despite the natural physical

tendency to sweat while participating in sports, 85% of patients did not think eczema affected their ability to play sports. This is due to not many participants actually participating in sports or exercise, which is very common among Vietnamese people. Regarding clothes, the number of females thought it was as an aspect that eczema influenced negatively on was more than the number of males. This study used a new reference designed for the Vietnamese to compute an accurate and suitable utility index. Nevertheless, it could be a congestion to collate with other studies. The regression and Spearman method proved the correlation between the results of the DLQI, the EQ-5D questionnaire, and VAS. There should be further research with a large sample size in Vietnam to create a formula that is interchangeable between the DLQI score and the EQ-5D utility index. It will be very useful in evaluating cost-effectiveness after that.

The post-assessment DLQI score improved 52.8% compared to the initial result, while the corresponding figure in the Holm et al's study[21] was solely 27%. Statistical tests were computed but there was no association between the modification of quality of life index with demographic factors. The multivariable model showed that the decrease of itchiness and sleeplessness correlated to the improvement of quality of life for patients. At present, most of the prescriptions in HCMC Hospital of Dermato-Venereology given to eczema patients have oral or topical medication to reduce pruritic feelings. Based on the reports of patients, dermatologists would prescribe the types of medications with distinguished levels following the guidelines of the National Hospital of Dermatology and Venerology in Vietnam.[12] Some cosmetics were introduced to prevent patients from having allergic reactions to soap and to supply moisture for their skin. Moreover, the modification of quality of life post-treatment was influenced by the initial index. Each incremental DLQI score will be reduced to 0.77 points for DLQI difference. Comparably, when using EQ-5D to appraise, people said that they had extreme or severe problems in each domain; after treatment, the re-evaluation showed a marked positive alteration. This could be explained by the medications prescribed being concentrated on symptomatic treatment with fast effects, unlike traditional medicine, which could make patients feel more comfortable in short time.

There was a reduction in the complaints about the treatment of the patient when repeated measurement. Because HCMC Hospital of Dermato-Venereology is a leading hospital not only in HCMC but also in southern Vietnam, its crowded environment could let patients inconvenient to the treatment. However, some patients who used to follow the same therapy program claimed that the relapse of eczema after treatment and re-treatment bothered them due to the wasted time and the economic burden. These patients had a tendency to combine treatments or change their regimen to follow traditional treatment. There should be a study to explore the consequences of re-treatment and the benefits of traditional treatment to have a comparison and also to create sufficient instruction for dermatologists.

This study followed the patients over a short time (four weeks), which could not completely reflect the effect of treatment. The research was conducted as a pre-post study, but there should be a control group to explore or eliminate factors that affected the results. The population site was carried out in one hospital solely, despite its reputation in Vietnam. Further studies are recommended to review a majority of medical centers in Vietnam for a comprehensive assessment. Besides the effectiveness of treatment, the cost of treatment is a concern for many patients who wish to pursue therapy treatments for eczema; this could be a remarkable path for future studies about eczema treatment.

Conclusion

This study appraised the impairment of quality of life due to eczema by using two common tools such as DLQI and EQ-5D. The results showed that the average DLQI score was 7.0 (95% CI: 6.2-7.8) and the association between the clinical symptoms and quality of life index. The treatment benefit was defined by the statistic outcome and the reduction of subjective symptoms became a key to improving quality of life for eczema patients. Cost evaluation should be the next step to assess the advantages of treatment completely.

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