

Willingness-to-pay per quality-adjusted life year of patients with psoriasis: A study in Vietnam

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ABSTRACT

Background: The chronic nature and frequent recurrence of psoriasis reduce patients' quality of life and increase treatment costs. This study aimed to estimate the willingness-to-pay (WTP) per quality-adjusted life-year (QALY) of psoriasis patients in Vietnam. Patients and methods: A cross-sectional study was conducted based on face-to-face interviews with psoriasis patients at Ho Chi Minh City (HCMC) Hospital of Dermato-Venereology. The Euro Quality of Life 5-Dimension 5-Level (EQ-5D-5L) questionnaire was used, and questions about WTP were asked. Factors related to WTP per QALY were analysed statistically. Results: A total of 310 psoriasis patients (58.4% males; mean age of 48.84±16.27 years) were included. The mean disease and treatment durations were 11.51±9.82 and 9.69±8.87 years, respectively. The mean health-related quality of life was 0.787±0.128, and WTP/QALY was 7,726.86±4,506.82 USD (179,100,000±104,463,500 VND). Patients with university/college degrees had a significantly higher WTP/QALY (10,666.60 USD - 247.24 million VND) than patients with high school or under high school education (8,440.44 and 6,638.38 USD - 195.64 million and 153.87 million VND, $p<0.05$). There was a significant negative correlation between WTP/QALY and age ($r=-0.247$, $p=0.000$). Conclusions: The WTP per QALY of psoriasis patients was almost 3 times higher than GDP per capita of Vietnam in 2018. Education level, health-related quality of life and age are associated with WTP/QALY.

Keywords: WTP/QALY, EQ-5D-5L, Dermato-Venereology hospital, related factors

1. INTRODUCTION

Psoriasis is a chronic inflammatory skin disease that is persistent and frequently reoccurs. The causes of disease are related to genetics, and the disease affects patients' overall skin, mucous membranes, nails and joints [1, 2]. Psoriasis can occur at any age from infancy to old age but normally occurs between the ages of 50 and 69 [3]. Psoriasis currently has two main types of treatment: traditional therapy (including topical, phototherapy and conventional systemic therapies), which has many side effects, and biological therapy, which has been shown to be safe and effective. However, the cost of biologics is relatively expensive... Moreover, the cost-effectiveness of psoriasis

treatment should be compared to the willingness-to-pay (WTP) of psoriasis patients in order to determine the appropriate treatment [4]. In pharmacoeconomic, WTP is the maximum amount an individual is willing to pay for a unit of change in health usually calculated as a quality-adjusted life year (QALY) gain or a life year gained (LYG) [5]. To obtain a suitable cost-effectiveness threshold for assessing a treatment, the study analysed the WTP per QALY of psoriasis patients based on Euro Quality of Life 5-Dimension 5-Level (EQ-5D-5L). Among the many scales to assess health-related quality of life (HRQoL), such as Short Form-36 (SF-36) [6], Health Utilities Index (HUI) [7], EQ-5D-5L and VAS, the

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EQ-5D-5L and VAS are generic tools that are used frequently in many countries [8]. This study used the Vietnamese version of the EQ-5D-5L with the Thailand value set, due to the proximity between Thailand and Vietnam, according to the suggestion of Agota et al [9].

In Vietnam, patients and health insurance co-pay on total amount of the medical examination, so the patient has the right to choose the treatment that is appropriate for their affordability and doctor's recommendations.

2. MATERIAL AND METHODS

2.1. Study design

The study has been conducted using a cross-sectional design. The dataset consisted of data from medical records and from directly interview by questionnaires in January 2018 at Ho Chi Minh City (HCMC) Hospital of Dermato-Venereology.

2.2. Study participants

Psoriasis patients, satisfying the inclusion and exclusion criteria (Table 1) were randomly selected to participate in the study during their treatment at HCMC Hospital of Dermato-Venereology.

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> - Psoriasis patients were identified based on ICD-10 (L40) and treated at HCMC Hospital of Dermato-Venereology who agreed to take part in the study - Patients can read, write and answer all questions in the survey questionnaire - Patients use health insurance for treatment - Patients self-decide the type of treatment based on the consultation of doctors. 	<ul style="list-style-type: none"> - Patients not able to communicate in Vietnamese - Patients who did not complete the survey questionnaire.

2.3. Sample size

To estimate the sample size, a pilot study on 30 patients in research hospital has been conducted due to the unavailability of researches on the WTP of psoriasis patients. Based on the results of pilot study, it has been shown that the mean WTP was 5,723.31 USD/QALY (132,66 million VND/QALY) with standard deviation of 4,558.03 USD/QALY (105,65 million VND/QALY). The margin of error was estimated as 10% of mean [10], which is equivalent to 572.07 USD (13.26 million VND). Sample size was estimated using the following formula [11]:

$$n = \frac{z_{\alpha/2}^2 \times \sigma^2}{e^2} = \left(\frac{z_{\alpha/2} \times \sigma}{e} \right)^2 = \left(\frac{1,96 \times 105,65}{13,26} \right)^2 = 244 \text{ patients}$$

In which,

n is the minimum sample size,

α is the confidence interval for the mean (95%),

z is the z value (e.g. 1.96 for a 95% confidence level) (1.96)

σ is the standard deviation (105.65)

e is the margin of error (10% of the mean) (13.26) [10],

The response rate was 20% from pilot study, therefore the minimum sample size was 292 patients (242 * 120%).

2.4. Sampling method

A systematic random sampling has been used. With a sampling period of 1 month (22 working days) and the sample size of 292 psoriasis patients, the sample size for a day is about 14 patients. With an interview duration of about 15 minutes per patient and 100 outpatient psoriasis patients per day, one patient was selected for study every 7 outpatients with psoriasis. If the selected patient did not meet the inclusion criteria or met exclusion criteria, the interviewer would choose the next patient to interview. Time for sampling at research hospital were from 8 am to 11 am or 1 pm to 4 pm everyday.

2.5. Questionnaire

The first part of the questionnaire collected demographic and disease-related information. The second part is the EQ-5D-5L scale, consisting of five dimensions of health (Mobility, Self-care, Usual Activities, Pain/Discomfort and Anxiety/Depression), which have five levels of response: from no problems to extreme problems [12]. The patients respond to the EQ-5D-5L questions based on the current state of their health [13]. Based on the combination of 5

dimensions and 5 levels of response, there were 3125 possible health states, which could be transformed into utility score by using the interim scoring for EQ-5D-5L. Due to the unavailability of Vietnamese value set in 2018 and based on the geographical proximity and socio-economic similarity recommended by Agota Szende and colleagues in Thailand [14], Thailand value set has been used with score ranging from -0.451 to 1. EQ-5D-5L also included visual analogue scale called EQ-VAS for patient to self-rate their health from a 0 – 100 unit 'thermometer-type' scale with 100 representing "the best health you can imagine" and 0 – "the worst health you can imagine" [15]. Then, interviewer confirmed once again about patient's current health point by repeating the question and recording it in numbers to ensure accuracy.

The last part of the questionnaire involves questions about the participant's WTP per QALY (WTP to gain to 1-life-year with perfect health) and the WTP per month for three scenarios (improving one's health status by 10 points, retaining one's current health status, and preventing a decline in one's health status by 10 points), using a sequential auction approach [16]. Based on the initial price offered by the respondent for 4 new treatments (treatment to gain 1-life-year with perfect health and three above scenarios) without co-payment from health insurance, the interviewer gradually increased the price until the respondent refused to pay. WTP is the highest price that patients still accept to pay for treatment before refusing.

2.6. Data collection and analysis

Face-to-face interviews with psoriasis patients were carried out by 3-part questionnaire at HCMC Hospital of Dermato-Venereology. Each interview took approximately 15 minutes. Socio-demographic information included age, gender, education, location, occupation, marital status. Disease-related characteristics included disease duration, treatment duration.

The WTP values for the three scenarios were calculated using the following formula:

$$WTP = WTP/MONTH \times 12 \text{ (VND)}$$

The WTP per QALY was estimated using the following expression:

$$WTP/QALY = \frac{WTP/month \times 12}{1 - HRQoL} \text{ (VND)} \text{ [17]}$$

WTP/QALY is the maximum amount the patients would be willing to pay per year for a product that would allow them to gain 1 QALY (1 life year with perfect health). So to estimate WTP/QALY, cases with perfect health (HRQoL = 1.000, state 11111 in EQ-5D-5L) were removed.

The WTP values were asked in VND, then calculated and exchanged to USD using the exchange rate: 1 USD = 22,602.05 VND in 2018 (the World Bank).

2.7. Statistical analysis

After data collection, the data were double-checked and cleaned before analysis. The data were analysed with relevant statistical tests (Mann-Whitney U, Kruskal-Wallis H, Spearman) and simple linear regression using SPSS 20.0 statistical software provided by IBM (International Business Machines Corp, New York, USA). A p-value <0.05 was considered statistically significant. To estimate the proportion of patients willing to pay a specific amount of money, three linear regression models, corresponding to the three WTP scenarios (avoiding a decrease, retaining, and improving one's health status), were performed. In this system, monthly cost out of pocket (x-variable) was a good predictor of the proportion of patients willing to pay that cost (y-variable).

2.8. Ethical approval

The research was conducted with the permission of the Board of Directors, the Science-Technology Council of Hospital of Dermato-Venereology Ho Chi Minh City. All participants were informed about the study's purposes and confidentiality, and they provided written informed consent before survey. The data is kept confidential and is used for scientific purposes.

3. RESULTS AND DISCUSSIONS

3.1. Results

3.1.1. Demographic and disease-related characteristics

The demographic and disease-related characteristics of the sample of 310 participants are shown in Table 2.

Table 2. Demographic and disease-related characteristics of the patients

Characteristic		Frequency (percentage)/ Mean (standard deviation)	Cumulative percentage
Gender	Male	181 (58.4%)	58.4%
	Female	129 (41.6%)	100.0%
Education	Less than high school	163 (52.6%)	52.6%
	High school	109 (35.2%)	87.8%
	University/college	38 (12.2%)	100.0%
Location	Ho Chi Minh City	212 (68.4%)	68.4%
	Other provinces/cities	98 (31.6%)	100.0%
Occupation	Intellectual work	37 (11.9%)	11.9%
	Manual work	109 (35.2%)	47.1%
	Unemployed	26 (8.4%)	55.5%
	Retired	61 (19.7%)	75.2%
	Others	77 (24.8%)	100.0%
Marital status	Single	39 (12.6%)	12.6%
	Married	266 (85.8%)	98.4%
	Divorced	5 (1.6%)	100.0%
Income	Yes	123 (39.7%)	39.7%
	No	187 (60.3%)	100.0%
Income	7,152,766 (VND)		
Disease duration		11.51 ± 9.82 (years)	
Treatment duration		9.69 ± 8.87 (years)	
Age		48.84 ± 16.27 (years)	

In total, 310 patients with psoriasis (181 males and 129 females) were enrolled in the study. More than a half of the patients had an education level less than high school (52.6%) and lived in HCMC (68.4%). The most common occupation was manual work (35.2%), followed by retirement (19.7%). Most of the patients were married (85.8%). The age of participants ranged from 8 to 84 years with a mean age of 48.84 ± 16.27 years. The mean disease duration was 11.51 ± 9.82 years and the mean treatment duration was 9.69 ± 8.87 .

The majority of patients have no income (187 patients which occupied 60.3%) because most of patients were elderly (48.84 ± 16.27 years) and were unemployed, retired... (52.9%). The average income of patients was 308.59 USD (7,152,766 VND) (calculated on group of income-patients).

3.1.2. Health-related quality of life

Among the 310 patients, there were 66 patients with perfect health (HRQoL = 1.000). HRQoL is presented in Table 3.

Table 3. Health-related quality of life (HRQoL) of psoriasis patients

N (patients)	Mean	Standard deviation	Min	Max	Percentiles		
					25%	50%	75%
310	0.787	0.128	0.414	1.000	0.708	0.780	0.814

As shown in Table 3, the mean HRQoL of the study sample was 0.787 ± 0.128 (from 0.414 to 1.000),

based on the EQ-5D-5L. The interquartile range was 0.106, which means that the HRQoL had a

narrow distribution; 75% of the patients had HRQoL > 0.708.

3.1.3. Monthly willingness-to-pay for different scenarios

The WTP values for one month of treatment were

calculated for three scenarios, comprising improving one's health status by 10 points, retaining one's current health status, and preventing a decline in one's health status by 10 points. The results are presented in Figure 1.

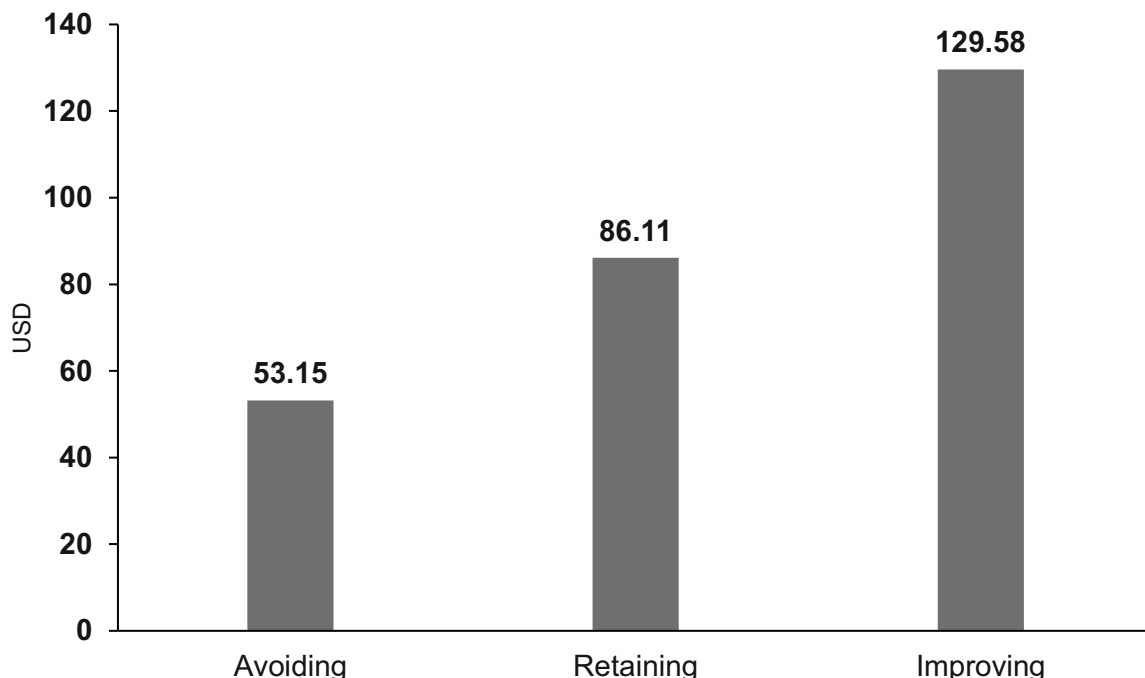


Figure 1. Monthly willingness to pay for three scenarios

As shown in Figure 1, WTP for the improving scenario was the highest among three scenarios (128.39 ± 77.03 USD; equivalent to 3,006,376 ± 1,803,866 VND); it was 2.5 times higher than that related to the avoiding scenario (52.66 ± 41.52 USD; equivalent to

1,233,054 ± 972,166 VND). Patients were willing to pay 85.32 ± 57.56 USD (1,997,819 ± 1,347,952 VND) for retaining their current health. Linear regression was used to explore the price sensitivity related to the three scenarios, as presented in Figure 2.

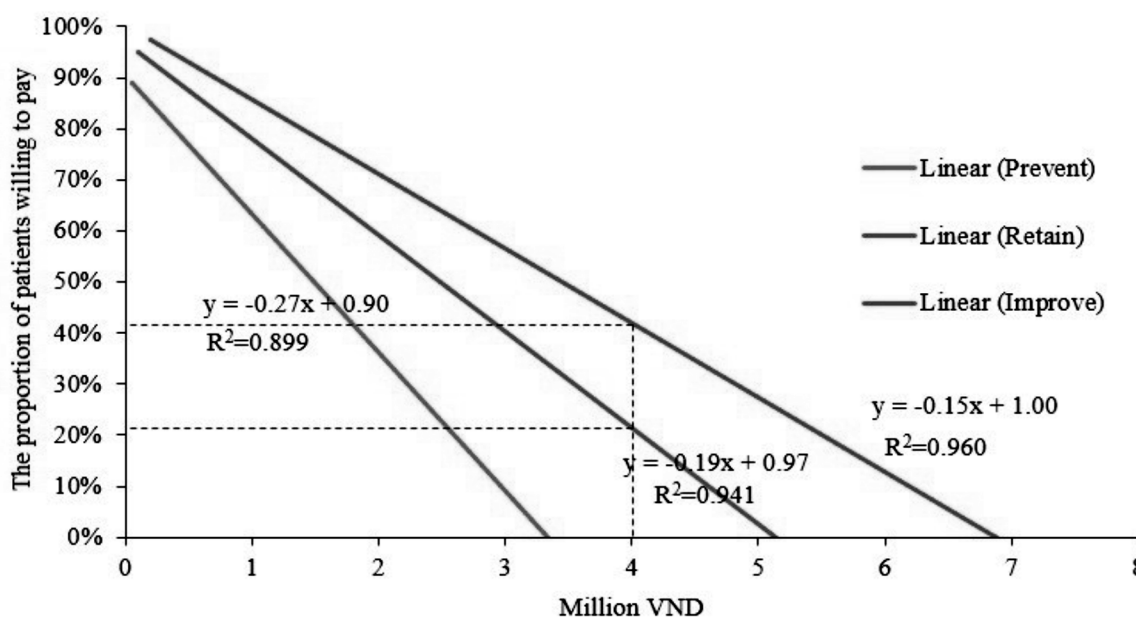


Figure 2. Linear price sensitivity of psoriatic patients

Note: x - monthly cost out of pocket; y - the proportion of patients willing to pay.

According to 3 regression equations, we noted that due to one million VND (43,07 USD), the proportion of patients willing to pay for avoiding health status reduction decreased 27%; for relating their health status decreased 19% and for improving their health status decreased 15%.

As shown in Figure 2, the maximum WTP for avoiding health status reduction was 140.93 USD (3.3 million VND), which is less than the gross national income per month in Vietnam in 2017 (170.82 USD; equivalent to 4 million VND). Only 21.5% of patients were willing to pay 170.82 USD

to retain their health status, which was half the percentage willing to pay 170.82 USD to improve their health status (41.9%).

3.1.4. Willingness-to-pay per quality-adjusted life year

From the initial sample of 310 patients, 66 were excluded due to their scores (perfect health) on the EQ-5D-5L scale and 12 were excluded as outliers, leaving 232 samples for the WTP/QALY analysis. The WTP/QALY of psoriasis patients is presented based on boxplot diagram (Figure 3).

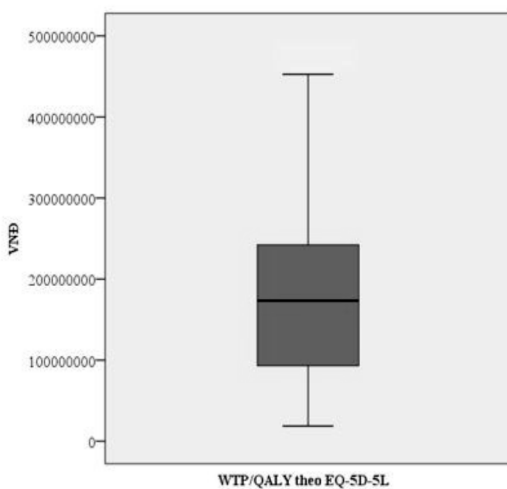


Figure 3. Willingness-to-pay per quality-adjusted life year

The mean WTP/QALY was $7,726.86 \pm 4,506.82$ USD (179.10 ± 104.46 million VND), which was almost three times higher than GDP per capita of Vietnam in 2018 (2,566.6 USD). The median was 7,481 USD (173.42 million VND), indicating that 50% of patients would be willing to pay more than

7,481 USD per QALY.

3.1.5. Related factors to willingness-to-pay per quality-adjusted life year

The results regarding the related factors to WTP/QALY are presented in Tables 4 and 5.

Table 4. Qualitative factors that related to willingness-to-pay per quality-adjusted life year

Characteristic		WTP/QALY		p-value
		Mean	SE	
Gender	Male	189,023,500	9,247,000	0.067
	Female	167,902,000	10,146,500	
Education level	Under high school	153,873,000	8,597,000	0.000
	High school	195,641,500	11,162,000	
	University/college	247,242,500	23,005,000	
Location	HCMC	175,995,000	8,413,500	0.535
	Other provinces/cities	185,000,000	11,879,000	
Marital status	Single	220,398,000	21,612,500	

Characteristic		WTP/QALY		p-value
		Mean	SE	
Marital status	Married	175,699,500	7,229,000	0.210
	Divorced	92,110,000	36,670,500	
Occupation	Intellectual work	249,324,000	21,361,500	0.000
	Manual work	166,761,000	10,651,500	
	Unemployed	162,825,000	21,931,000	
	Retired	134,731,500	12,547,500	
	Others	211,335,500	14,503,500	

As shown in Table 4, education level significantly influenced WTP/QALY ($p=0.000$). In detail, patients with university/college degrees had a significantly higher WTP/QALY (10,558.41 USD; equivalent to 247.24 million VND) than patients with high school education (8,354.87 USD; equivalent to 195.64 million VND) and patients with under high school

education (6,571.15 USD; equivalent to 153.87 million VND). Moreover, patients who undertook intellectual work had the highest WTP/QALY (10,647.38 USD; equivalent to 249.32 million VND) among the occupation groups; this difference was significant ($p=0.000$). However, gender, location and marital status had no effects on WTP/QALY.

Table 5. Quantitative factors that impact willingness-to-pay per quality-adjusted life year

Characteristics	WTP/QALY	
	Correlation coefficient	p-value
Disease duration	0.030	0.646
Treatment duration	0.044	0.504
Age	-0.247	0.000
HRQoL	0.380	0.000

As shown in Table 5, there was a significant negative correlation between WTP/QALY and age ($r=-0.247$, $p=0.000$). HRQoL had a moderate positive correlation with WTP/QALY ($r=0.380$, $p=0.000$). Disease and treatment duration were not correlated with WTP/QALY (estimated by

EQ-5D-5L). From table 4 and 5, there are 3 factors can be selected to build linear regression model: education level, occupation and HRQoL. Using forward selection method, the model has been built and represented in Table 6.

Table 6. Linear regression model

	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (β_k)	t	Sig.
(Constant)	-158,835,484.90	65,695,302.43		-2.42	0.016
EQ-5D	506,049,418.20	87,513,428.40	0.346	5.78	0
Under high school	-41,831,520.55	12,359,008.45	-0.200	-3.39	0.001
Retirement	-38,394,162.44	15,482,427.56	-0.147	-2.48	0.014

According to table 6, HRQoL has positive significant correlation with the total treatment cost ($\beta_k > 0$), patients with under high school level and patients who retired have negative significant correlation with the total treatment cost ($\beta_k < 0$). The p-values of t-test of intercept and all independent variables are <

0.05. Therefore, each independent variable can be used to explain the variability of the total cost. In detail, HRQoL has the greatest impact on the total cost of treatment with $\beta_k=0.346$; and occupation (patients who retired) has the lightest impact with $\beta_k=-0.147$.

4. DISCUSSIONS

According to this study, the number and HRQoL of male patients with psoriasis was higher than the number and HRQoL of female patients, which is similar to studies by Moradi et al. [18] and Ko et al. [19], in which the ratio of males to females was 3:1. The mean age of psoriasis patients undergoing treatment at HCMC Hospital of Dermato-Venereology was 48.84 years, which is higher than patients in Iran (40.40 years) [18] and Taiwan (44.52 years) [19]. The disease duration of the participants was moderate (11.51 years) compared to the disease duration in the studies in Iran (13.60 years) and Taiwan (10.90 years). The mean HRQoL of the participants was 0.787 ± 0.128 , which was higher than that in the study by Moradi et al. (EQ-5D-5L: 0.62 ± 0.37) [18], but similar to that in the study by Ko et al. (EQ-5D-5L: 0.82) [19].

The results of this research related to the Vietnamese health care context where patients may have more of a choice about the type of treatment they will take up because they are paying out of pocket. Therefore,

for the same cost threshold, the proportion of patients willing to pay was highest for the treatment to improve health status, followed by the treatment to retain health status, and lowest for the treatment to avoid decreased health status. In contrast, in a previous study by Dierick and Rose [20], for the same cost threshold, more patients were willing to pay for treatment to avoid decreased health status than to improve health status.

This study found that the mean WTP/QALY was $7,726.86 \pm 4,506.69$ USD/QALY (179.10 million \pm 104.46 million VND/QALY) based on EQ-5D-5L. According to the World Bank report, Gross national income (GNI) of Vietnam in 2016 is equivalent to US \$ 2,060.0 per capita and GDP per capita in Vietnam in 2016 reached \$ 2,170.6 per capita. Thus, the value of WTP / QALY obtained from this study is 3.81 times higher than Vietnamese GNI per capita and 3.58 times higher than GDP per capita.

Comparing the results of this study with others, it has been found that a study by Bobinacet et al. [21] reported a higher WTP/QALY for general patients (€24,500, corresponding to 667.70 million VND), based on the Dutch EQ-5D. Furthermore, a study by Martín-Fernández et al. [17] also reported higher WTP/QALY values for psoriasis patients, which were €10,119 regarding personal money (corresponding to 275.73 million VND) and €28,187 regarding taxes (corresponding to 768.07 million VND). Lundberg et

al. reported that psoriasis patients were willing to pay 1,253–1,956 Sweden crowns (SEK) (3.10 – 4.83 million VND) per month [22], which was lower than the result of this study. Moreover, Finlay et al. [23] also reported a lower WTP/QALY for psoriasis patients, which was £4,622 (120.89 million VND).

The estimated WTP/QALY can also be compared to the WTP/QALY values for other treatments. In a study in the USA, the WTP for asthma treatment ranged from \$200 to \$350 per month (corresponding to 54.60 – 95.55 million VND/QALY) [24]. Nguyen Thi Thu Thuy et al. found that the WTP/QALY of outpatients with heart disease at the HCMC Heart Institute in Vietnam was $2,162.74 \pm 144.96$ USD/QALY (50.13 \pm 3.36 million VND/QALY), which was markedly lower than the result in the current study [25]. This can be explained by the difference in socio-demographic characteristics of patients with different pathology, especially age, occupation status and monthly income.

This study also found that HRQoL was positively correlated with WTP/QALY (based on EQ-5D-5L scale). However, Radtke et al. [26] reported that, among vitiligo patients, there was a significant negative correlation between HRQoL (estimated by EQ-5D) and WTP/QALY. Van den Hout et al. [27] also reported a significant negative correlation between HRQoL (estimated by EQ-5D-5L) and WTP/QALY. This could be explained by the fact that patients with poor health status were more willing to pay for a treatment to improve HRQoL than patients already in good health.

This study noted that factors including education level and age influenced the WTP/QALY of the psoriasis patients, which concurs with the findings reported by Azimatun et al. [28]. However, Azimatun et al. reported that gender, location, and income were also significantly associated with WTP/QALY, while the current study did not find any relationships between these factors and WTP/QALY.

Future studies should identify more factors associated with WTP/QALY, such as disease-related factors and income, which was not included in this study.

There were differences with other studies because HRQoL has been estimated by EQ-5D-5L based on their individual feeling of health state, therefore, the results are objective and not able to be interpreted consistently across patients. This is also a characteristic of HRQoL estimation by EQ-5D-5L. The majority of research patients lived in Ho Chi Minh City, which is the most developed city in Vietnam,

therefore their affordability was quite high. Moreover, in Vietnam, patients and health insurance co-pay on total amount of the medical examination. Besides, WTP not only depends on personal income, but also household income, thus patients have low income or have no income still afford to pay for their treatment.

5. CONCLUSIONS

The WTP/QALY of the psoriasis patients was accounted for $7,726.86 \pm 4,506.84$ USD/QALY (179.10 ± 104.46 million VND) based on EQ-5D-5L and almost 3 times higher than GDP per capita of Vietnam in 2018. The amount of money that patients would be willing to pay for treatment to

improve their health status was by 10 points higher than for the two other treatments (retaining health status and avoiding decreased health status). Education level, age and HRQoL were associated with WTP/QALY. These findings may be referenced in future pharmacoeconomic studies.

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Ngưỡng chi trả trên mỗi năm sống có chất lượng ở bệnh nhân vẩy nến: Nghiên cứu tại Việt Nam

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TÓM TẮT

Bối cảnh: Tính chất mãn tính và tái phát thường xuyên của bệnh vẩy nến làm giảm chất lượng sống của bệnh nhân và tăng chi phí điều trị. Nghiên cứu này nhằm ước tính ngưỡng chi trả (WTP) cho mỗi năm sống được điều chỉnh chất lượng (QALY) của bệnh nhân vẩy nến tại Việt Nam. **Phương pháp:** Nghiên cứu cắt ngang thực hiện dựa trên phỏng vấn trực tiếp bệnh nhân vẩy nến tại Bệnh viện Da liễu TP.HCM, sử dụng bảng câu hỏi khảo sát chất lượng sống theo thang đo EQ-5D-5L và các câu hỏi về ngưỡng chi trả. Các yếu tố liên quan đến ngưỡng chi trả cho mỗi năm sống được điều chỉnh chất lượng (WTP/QALY) đã được phân tích thống kê. **Kết quả:** Tổng cộng 310 bệnh nhân vẩy nến (58.4% nam; tuổi trung bình 48.84±16.27 tuổi) được bao gồm trong nghiên cứu. Thời gian mắc bệnh và điều trị có giá trị trung bình 11.51±9.82 và 9.69±8.87 năm, tương ứng. Điểm chất lượng sống liên quan đến sức khỏe có giá trị trung bình 0.787±0.128, và WTP/QALY có giá trị 7,726.86±4,506.82 USD (179,100,000±104,463,500 VND). Bệnh nhân tốt nghiệp đại học/cao đẳng có WTP/QALY cao hơn đáng kể (10,666.60 USD - 247.24 triệu VND) so với bệnh nhân tốt nghiệp trung học phổ thông hoặc dưới trung học phổ thông (8,440.44 USD và 6,638.38 USD - 195.64 triệu và 153.87 triệu VND, $p < 0.05$). Có sự tương quan nghịch có ý nghĩa thống kê giữa WTP/QALY và tuổi ($r = -0.247$, $p = 0.000$). **Kết luận:** Ngưỡng chi trả cho mỗi năm sống được điều chỉnh chất lượng của bệnh nhân vẩy nến cao gấp gần 3 lần GDP bình quân đầu người của Việt Nam năm 2018. Trình độ học vấn, chất lượng cuộc sống liên quan đến sức khỏe và tuổi có liên quan đến WTP/QALY.

Từ khóa: WTP/QALY, EQ-5D-5L, Bệnh viện Da Liễu, yếu tố liên quan

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