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A systematic review and meta-analysis of health-related quality of life values derived from EQ-5D-5L in psoriatic patients

Minh Anh Hoang*, Nu Hanh Van Pham, Hai Linh Tran, Ngoc Tram Doan, Phuong Anh Dong

Hanoi University of Pharmacy, 15 Le Thanh Tong Street, Phan Chu Trinh Ward, Hoan Kiem District, Hanoi, Vietnam

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Abstract:

Purposes: To synthesise the health-related quality of life (HRQoL) values derived from the EQ-5D-5L in psoriatic patients. Methods: A literature search was conducted in PubMed, Embase, Cochrane Library, and Trip databases on 27 January 2023, reporting HRQoL values derived from EQ-5D-5L in psoriatic patients. Meta-analysis was performed to estimate HRQoL in psoriatic patients, with subgroup analyses conducted on Asian versus non-Asian populations, and in plaque psoriasis and psoriatic arthritis patients. Results: Eighteen studies with 7,015 patients were included in this study. The pooled EQ-5D-5L value in psoriatic patients was 0.73 (95% CI: 0.68-0.79; I^2=99.4%). The value was not significantly different in the Asian versus non-Asian subgroup, being 0.83 (95% CI: 0.76-0.91) and 0.76 (95% CI: 0.72-0.80) respectively. The value in the plaque psoriasis subgroup was 0.83 (95% CI: 0.78-0.88), which was higher than 0.68 (95% CI: 0.64-0.72) in psoriatic arthritis patients. Conclusions: This study provides a comprehensive and updated estimate of HRQoL value derived from EQ-5D-5L in psoriatic patients. The pooled value did not differ in the Asian versus non-Asian population. Psoriatic arthritis patients had a lower value compared to plaque psoriasis patients. This study will be useful for future economic evaluations of psoriasis treatments.

Keywords: **EQ-5D-5L, health-related quality of life, meta-analysis, psoriasis, quality of life.**

Classification number: **3.2**

1. Introduction

Psoriasis is a chronic skin condition that affects about 60 million people worldwide, with the prevalence in Asian populations ranging from 0.11 to 0.68% [1]. In Vietnam, according to statistics from the Central Dermatology Hospital in 2010, psoriatic patients accounted for approximately 2.2% of total outpatient visits [2]. Although the disease is not life-threatening, it significantly impacts the physical, mental, and quality of life of individuals. A study by J. Korte, et al. (2004) showed that psoriatic patients reported physical discomfort, impaired emotional functioning, a negative body and self-image, limitations in daily activities, social contacts, (skin-exposing) activities, and work [3]. Furthermore, research by S.K. Kurd, et al. (2010) [4] revealed that the risk of depression, anxiety, and suicide in psoriatic patients was 1.39, 1.31, and 1.44 times higher, respectively, compared to the control group.

HRQoL refers to aspects of quality of life affected by disease and its treatment, including physical, psychological, and social functioning [5, 6]. The EQ-5D is a preferred tool for measuring HRQoL in economic evaluations [7]. The EQ-5D comprises two versions, with the 5-level EQ-5D-5L being preferable to the EQ-5D-3L in psoriatic patients due to its better ability to reduce ceiling effects and enhance useful information [8].

In Health Technology Assessment, systematic review and meta-analysis play an important role in synthesising evidence for cost-effectiveness models, including HRQoL [9]. Several systematic reviews and meta-analyses on HRQoL in psoriatic patients have been reported. A.H. Møller, et al. (2015) [10] concluded that HRQoL values measured by EQ-5D were lower in psoriatic patients compared to other chronic conditions such as cancer and cardiovascular diseases. Z. Yang, et al. (2020)'s [8] meta-analysis showed that the HRQoL value in psoriatic patients derived from EQ-5D was influenced by disease group and DLQI index. T. Zhou, et al. (2021) [11] performed a review of HRQoL values measured by EQ-5D-5L in various patient populations, including psoriasis, revealing different values influenced by disease conditions, gender, age, and disease severity.

These studies included only a few that reported HRQoL values derived from EQ-5D-5L, with only Z. Yang, et al. (2020) [8] performing a meta-analysis in the plaque psoriasis population. There was an absence of systematic reviews or meta-analyses evaluating HRQoL values obtained from EQ-5D-5L in psoriatic patients, including patients with psoriatic arthritis. In addition, no study has determined the HRQoL value derived from EQ-5D-5L in Asian psoriatic patients.

*Corresponding author: Email: hoanganh318hup@gmail.com

Therefore, this study aimed to summarise and synthesise published studies on HRQoL values derived from EQ-5D-5L in psoriatic patients and estimate the pooled value in this population. The second aim was to estimate these values in psoriatic patients according to study location and different disease groups through a meta-analysis.

2. Subjects and methodology

This systematic review and meta-analysis was conducted and reported in accordance with the NICE DSU Technical Support Document 9 [12].

A comprehensive search was conducted in PubMed, Embase, Cochrane Library, and Trip databases for relevant articles published as of 27 January 2023. Criteria for identifying keywords for PICOT elements are presented in Table 1. The search strategy focused on the keywords: population ("psoriasis") and outcomes ("HRQoL" and "EQ-5D"), detailed in Supplemental material S1.

Table 1. Criteria for identifying keywords for PICOT elements.

PICOT elements	Criteria
Population	Psoriatic patients (in all subtypes)
Intervention	Unlimited search
Comparator	Unlimited search
Outcome	HRQoL values derived from EQ-5D-5L (unlimited value sets)
Timeframe	Article published as of January 27, 2023

The articles obtained from the search were screened for abstracts and full texts according to the inclusion and exclusion criteria detailed in Table 2. These steps were performed independently by three researchers to select and exclude articles based on a consensus principle. Any discrepancies were resolved through discussion to make a final decision.

Table 2. Criteria for selection and exclusion of articles.

Inclusion criteria	Exclusion criteria
The population studied in the articles was diagnosed with psoriasis in all subtypes.	For duplicate articles: Select the most recent and comprehensive report
Article results reported HRQoL values derived from EQ-5D-5L presented as mean (or median) and 95% CI (or standard error, standard deviation, interquartile range).	Inappropriate publication types: review, clinical question, study protocol, comment, letter, conference abstract...
Articles have been published in English	Inappropriate study design: animal studies, case report, pilot studies, pharmacodynamic/ pharmacokinetic studies...
For articles analysing data from the same study: Select the article reporting HRQoL value for general study population with the largest sample size.	Articles reporting HRQoL value obtained through mapping technique from instruments other than EQ-5D-5L if this technique was not performed by the same authors of the study.
	Articles that cannot be accessed in full text.

The quality of the included articles was assessed according to the criteria set outlined in NICE DSU 9, detailed in Table 3 [12].

Table 3. Key criteria to consider in quality assessment of studies.

Criteria	Consider
Sample size	This is not an exclusion criterion, but the precision of the estimate should be reflected in the variance around any estimate used in a model.
Respondent selection and recruitment	Does this result in a population comparable to that being modelled?
Inclusion/exclusion criteria	Do these exclude any individuals that might (e.g. the very elderly >80 years old are often not included in studies)?
Response rates to instruments used to	Are response rates reported and if so, are the rates likely to be a threat to validity?
Loss to follow-up	How large is the loss to follow-up (e.g. one year after a fracture) and are these reasons given? What are these likely to threaten the validity the estimates?
Missing data	What are the levels of missing data and how are they dealt with? Again, could this threaten the validity of the estimates?

Data from the included articles were managed in EndNote 20 and extracted by two researchers using Microsoft Excel 2016 based on the consensus principle. The extracted data included: general article information: title, publication year, main author, country/region, study design, data collection, sponsors and conflicts of interest; information about the study population: psoriatic patient groups, inclusion criteria, sample size, age, disease duration, female proportion; information about HRQoL: value set, results for mean (or median) of HRQoL values, 95% CI (or standard error, standard deviation, interquartile range) of the original study population and subgroups. The values collected from these studies were converted to mean (95% CI) according to the formulas proposed by X. Wan, et al. (2014) [13] and Cochrane Handbook for Systematic Reviews of Interventions version 6.5.2 [14] for inclusion in the meta-analysis.

Heterogeneity was evaluated through forest plots and I^2 statistics in the Cochrane's Q test. Values of 30-60, 50-90, and 75-100% were considered as moderate, substantial, and considerable heterogeneity, respectively. A random effects model with the DerSimonian and Laird method was used if heterogeneity was present; otherwise, a fixed effects model was used. P-value<0.10 was considered statistically significant, indicating heterogeneity among the included studies [14].

Publication bias was assessed using a funnel plot (asymmetric) or an Egger test. Sensitivity analysis was a common method used to examine the source of heterogeneity among studies by excluding one or more studies and assessing the impact on the summary results and between-study heterogeneity [15]. In this study, we conducted a sensitivity analysis by systematically excluding each study to determine the individual impact of each study on the meta-analysis results.

Subgroup meta-analysis was conducted to estimate mean values in patients by study location and psoriatic patient groups, requiring four or more studies to report HRQoL values in each subgroup, as recommended by ISPOR [16]. The pooled values in subgroups with different characteristics were compared by a two-sample t-test.

Data were analysed in R language and RStudio 4.2.2. Results were considered statistically significant with $p<0.05$, except for heterogeneity with $p<0.10$ which was considered statistically significant.

3. Results

3.1. Study selection

The PRISMA flow diagram showing the study selection process is illustrated in Fig. 1. A total of 1,506 articles were identified from four databases. Subsequently, 501 articles were removed due to duplication. After screening abstracts for relevance, 672 articles were excluded as they did not meet the predefined criteria. Full-text screening was conducted on 333 articles, from which 18 articles corresponding to 18 studies reporting HRQoL derived from EQ-5D-5L were included in the systematic review [17-34].

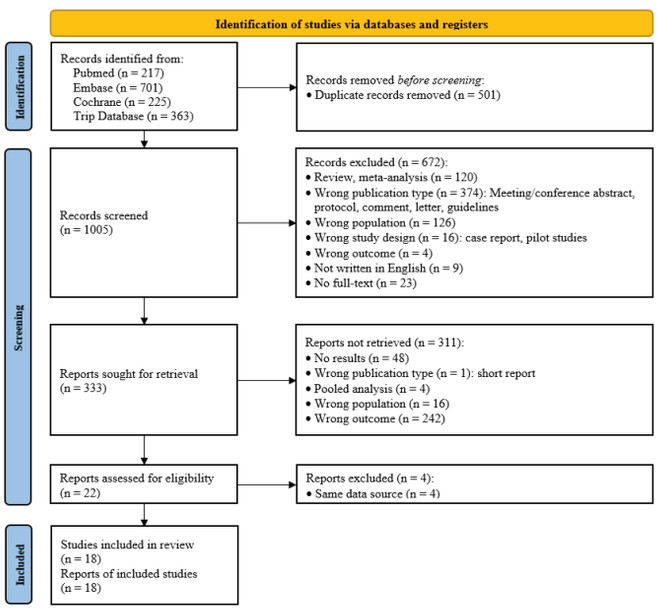

Fig. 1. PRISMA flow diagram of study selection.

3.2. Quality assessment of studies

Most of the 18 studies included in this review were at risk of data bias related to sample size, respondent selection and recruitment, selection/exclusion criteria, loss of follow-up, and missing data.

Among these, five studies had a sample size of less than 100 patients, with M. Sarobe, et al. (2021) [27] comprising only 16 patients [18, 20, 27, 28, 31]. Seven studies were conducted at multicentre locations [19-21, 23, 24, 26, 29] and one study did not report adequate information [30], while the remaining studies primarily recruited respondents from the private health sector [32] pharmacy/clinical department [18, 22, 25, 27, 28, 31, 33], or outpatient settings [17, 28, 34]. The criteria for selection/exclusion introduced a potential risk of bias, specifically, five studies limited patient selection in terms of diseases [17, 19, 26, 31, 34], while nine studies limited it based on both diseases and medication use [18, 20-24, 27, 29, 32]. The response rates across all studies were high, ranging from 82.3 to 100.0%, with the exception of P.M. Young, et al. (2019) [33], which did not report. The included studies had a low risk of bias due to loss of follow-up. Most studies either had no significant loss (only one patient) [18, 21, 24, 29] or employed strategies to address missing follow-up data, such as excluding patients from analysis and delivering questionnaires to those out of follow-up [22, 26, 33]. Only two studies had a potential bias risk related to missing data because they did not report how to manage it [18, 27].

3.3. Study characteristics

The main characteristics of the 18 studies are presented in Table 4. This review included 18 studies involving a total of 7,015 patients. Four studies were conducted in Asia only [17, 20, 31, 34], eight were conducted outside of Asia including Europe (seven studies) [18, 22, 25, 27, 28, 30, 32] and America (one study) [33], and six were multi-continent studies [19, 21, 23, 24, 26, 29]. The study designs included cross-sectional (nine studies) [17, 20, 25, 27, 28, 30-32, 34], cohort studies (two studies) [18, 22], and randomised controlled trials (7 studies) [19, 21, 23, 24, 26, 29, 33]. Regarding subtypes, six studies focused on plaque psoriasis [20, 25, 26, 32-34] and one on guttate psoriasis [25], while the remaining studies did not specify. According to complications, 10 out of 18 studies reported values in patients with psoriatic arthritis [17-19, 21-25, 27, 29], whereas the remaining eight studies did not include information on complications.

The study having the smallest sample size was M. Sarobe, et al. (2021) [27], with 16 patients while V. Strand, et al. (2021) [29] had the largest sample size, comprising 1,704 patients. Fourteen studies reported the mean (median) age of the psoriatic patients, ranging from 39.0 to 54.0 [17-21, 23-26, 28, 29, 32-34]. The mean (median) duration of psoriasis varied from 3.4 to 18.1 years, as reported in 12 studies [17-21, 23-26, 28, 29, 34]. The female proportion in the study population ranged from 17.8 to 55.1%, as reported in 14 studies [17-21, 23-26, 28, 29, 32-34].

Among the 18 studies, 10 studies reported value sets for EQ-5D-5L, covering countries such as China, Thailand, Japan, the United Kingdom, the Netherlands, and the United States [17, 20, 23, 25, 28, 30-34]. Three studies used mapping methods to derive EQ-5D-5L values from EQ-5D-3L [30-32]. The mean HRQoL values obtained from EQ-5D-5L in psoriatic patients ranged from 0.60 to 0.90. Four studies conducted in Asia only reported mean values ranging from 0.76 to 0.90.

Table 4. Main characteristics of 18 included studies.

Study	Nation	Study design	Psoriasis group	Complication	Sample size	Age (year)	Disease duration (year)	Female percentage (%)	Value set	Measuring technique	Mean	95% CI
[30]	The UK (Europe)	Cross-sectional	P	-	100	-	-	-	The UK	Mapping from EQ-5D-3L	0.71	0.66-0.76
[32]	Greece (Europe)	Cross-sectional	PP	-	396	52.0	-	39.9	The UK	Mapping from EQ-5D-3L	0.74	0.72-0.76
[34]	China (Asia)	Cross-sectional	PP	-	350	39.0	8.4	30.3	China	Survey	0.90	0.89-0.91
[25]	Hungary (Europe)	Cross-sectional	P	-	237	47.4	18.1	37.4	The UK	Survey	0.84	0.82- 0.86
			PP	-	190						0.83	0.80-0.86
			GP	-	23						0.80	0.71-0.89
			-	PsA	99						0.76	0.72-0.80
[17]	Thailand (Asia)	Cross-sectional	-	PsA	129	47.6	12.1	46.5	Thailand	Survey	0.76	0.72-0.80
[19]	Multinational (Asia, Oceania, Europe and America)	RCT	-	PsA	661	51.0	11.0	54.3	-	Survey	0.60	0.58-0.62
[31]	China (Asia)	Cross-sectional	P	-	33	-	-	-	China	Mapping from EQ-5D-3L	0.77	0.69-0.84
[33]	The USA (America)	RCT	PP	-	296	49.0	-	49.7	The USA	Survey	0.81	0.79-0.83
[28]	Netherlands (Europe)	Cross-sectional	P	-	82	50.9	3.4	35.4	Netherlands	Survey	0.72	0.63-0.80
[26]	Multinational (Asia, Oceania, Europe and America)	RCT	PP	-	821	47.3	17.9	30.1	-	Survey	0.80	0.79-0.81
[20]	Japan (Asia)	Cross-sectional	PP	-	73	54.0	15.3	17.8	Japan	Survey	0.89	0.85-0.93
[23]	Multinational (Asia, Europe, America)	RCT	-	PsA	473	46.2	5.8	48.1	The USA	Survey	0.60	0.59-0.61
[22]	The UK (Europe)	Cohort	-	PsA	154	-	-	-	-	Survey	0.67	0.63-0.70
[27]	Spain (Europe)	Cross-sectional	-	PsA	16	-	-	-	-	Survey	0.84	0.81-0.86
[29]	Multinational (Asia, Oceania, Europe and America, Africa)	RCT	-	PsA	1704	50.8	6.1	53.2	-	Survey	0.61	0.60-0.62
[24]	Multinational (Asia, Oceania, Europe and America, Africa)	RCT	-	PsA	443	52.9	8.2	55.1	-	Survey	0.60	0.58-0.62
[21]	Multinational (Asia, Oceania, Europe and America, Africa)	RCT	-	PsA	959	51.3	7.1	49.6	-	Survey	0.64	0.62-0.65
[18]	Switzerland (Europe)	Cohort	-	PsA	88	3.7	9.8	51.6	-	Survey	0.73	0.71-0.75

RCT: Randomised controlled trial, P: Psoriasis (unspecified subtypes), PP: Plaque psoriasis, GP: Guttate psoriasis, PsA: Psoriatic patients with psoriatic arthritis complication, -: Unreported.

Plaque psoriasis population had mean HRQoL values ranging from 0.74 to 0.90, as reported in 6 studies. Meanwhile, 10 studies reported values from 0.6 to 0.84 in psoriatic arthritis patients.

3.4. Meta-analysis of HRQoL values derived from EQ-5D-5L in psoriatic patients

The meta-analysis showed significant heterogeneity among the 18 studies (I^2=99.4%, p<0.0001), so the random effects model was used to estimate the pooled values. Based on this approach, the mean pooled HRQoL value in psoriatic patients was 0.73 (95% CI: 0.68; 0.79). The forest plot of this meta-analysis result is illustrated in Fig. 2.

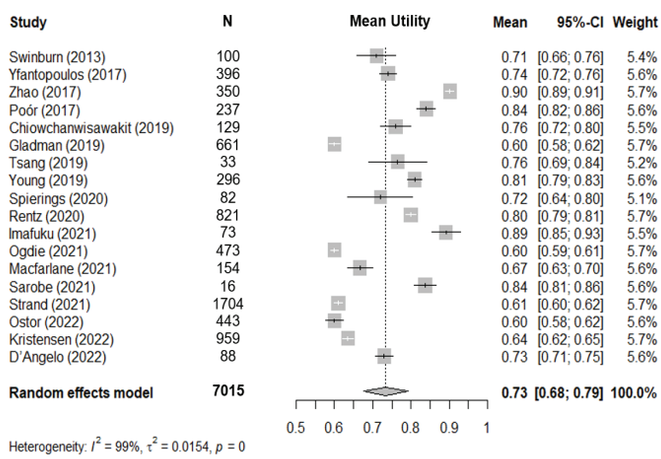

Fig. 2. Forest plot of meta-analysis of HRQoL values derived from EQ-5D-5L in psoriatic patients.

3.5. Leave-one-out sensitivity analysis

Leave-one-out sensitivity analysis for the meta-analysis of HRQoL values derived from EQ-5D-5L in psoriatic patients is presented in Fig. 3. This sensitivity analysis indicated consistent results without significant differences when individual studies were excluded (I^2=0.0%, p=1.00).

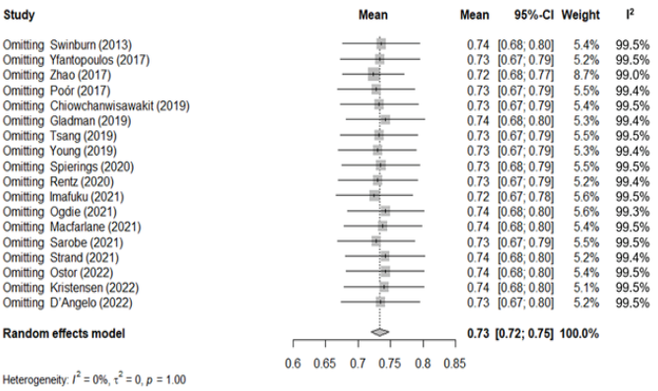

Fig. 3. Forest plot of leave-one-out sensitivity analysis for meta-analysis of HRQoL values derived from EQ-5D-5L in psoriatic patients.

3.6. Publication bias

The funnel plot for assessing publication bias across the 18 included studies is shown in Fig. 4. The symmetric funnel plot, along with the Egger's regression test result (p=0.4283), revealed no evidence of publication bias or data asymmetry.

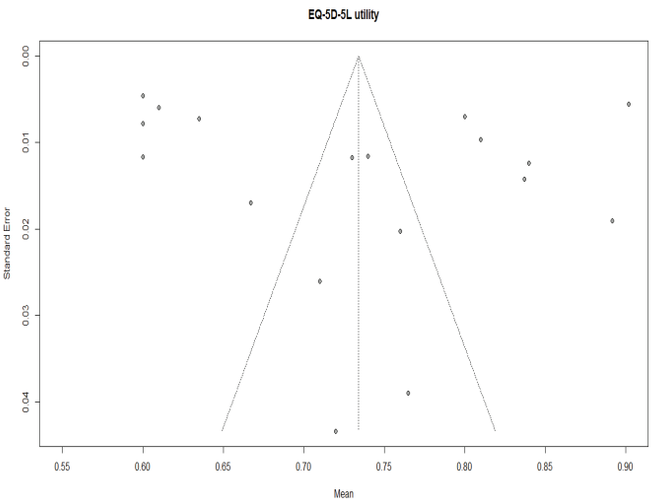

Fig. 4. Funnel plot of publication bias assessment for meta-analysis of HRQoL values derived from EQ-5D-5L in psoriatic patients.

3.7. Subgroup meta-analysis

Table 5 presents the results of subgroup meta-analyses based on study location and psoriatic patient groups. There was only one study on guttate psoriasis patients, so this group was not included in the analysis. The pooled HRQoL values derived from EQ-5D-5L did not significantly differ between Asian (0.83, 95% CI: 0.76, 0.91) and non-Asian (0.76, 95% CI: 0.72, 0.80) psoriasis populations (p=0.0874). Plaque psoriasis patients exhibited a pooled HRQoL value of 0.83 (95% CI: 0.78, 0.88), while psoriatic arthritis patients had a lower value of 0.68 (95% CI: 0.64, 0.72), indicating a statistically significant difference between the two groups (p<0.0001).

Table 5. Results of pooled HRQoL values in psoriatic patients classified by study location and psoriatic patient groups.

	Number of studies	Total number of patients	Mean (95% CI)	T-test (p-value)
Study location				
Asian	4	585	0.83 (0.76, 0.91)	p=0.0874
Non-Asian	8	1369	0.76 (0.72, 0.80)	
Psoriatic patient groups				
Plaque psoriasis	6	2126	0.83 (0.78, 0.88)	p<0.0001
Patients with psoriatic arthritis	10	4726	0.68 (0.64, 0.72)	

4. Discussion

This systematic review and meta-analysis included 18 studies with a total of 7,015 patients reporting HRQoL values derived from EQ-5D-5L in psoriatic patients. The psoriasis population was reported to have an age range from 39.0 to 54.0 years and a disease duration varying from 3.4 to 18.1 years. In addition, the female proportion in the study population ranged from 17.8 to 55.1%. These characteristics were consistent with the patient populations reported in epidemiological studies around the world and in Vietnam [35-40]. Consequently, the pooled HRQoL values hold potential applicability for global psoriatic patients, including those in Vietnam, particularly given the current absence of related studies within the Vietnamese context.

Based on a meta-analysis using the random effects model, the mean HRQoL value derived from EQ-5D-5L in psoriatic patients was 0.73 (95% CI: 0.68-0.79), which was equal to or lower than the values observed in patients with diabetes, cancer, cardiovascular diseases, COPD, chronic kidney disease, or HIV infection [11]. This finding highlighted the negative impact of psoriasis on patients' quality of life. Consequently, it is necessary to have effective psoriasis management and to enhance awareness and education regarding its physical, social, and psychological impacts.

Significant heterogeneity was observed in the meta-analyses (I^2>90.0%, p<0.01), which may result from the inclusion of different psoriasis conditions - psoriasis (unspecified), plaque psoriasis, and psoriatic arthritis - in the analyses of overall psoriatic patients, Asian, and non-Asian subgroups. Additionally, the heterogeneity between studies may be due to factors such as age, duration of disease, female proportion, injury areas, severity of disease, and treatments [8, 35, 41-45].

We found that HRQoL values from EQ-5D-5L in psoriatic patients varied based on the study location. The value in Asian psoriatic patients was 0.83 (95% CI: 0.76-0.91), higher than 0.76 (95% CI: 0.72-0.80) in the non-Asian population, although the difference was not statistically significant (p=0.0874). The result was similar to the variation in HRQoL among the general populations, with Asian countries exhibiting slightly higher EQ-5D-5L values compared to non-Asian countries. Specifically, in the Chinese general population, the HRQoL value was 0.957, higher than 0.851 in the USA, 0.897 in Spain, and the values observed in Japan were higher than those in England across corresponding age and gender groups [46-50]. The significant heterogeneity was found in both subgroup meta-analyses (I^2>90.0%, p<0.01), due to the inclusion of different psoriasis populations such as psoriasis (unspecified group), psoriasis plaque, and psoriatic arthritis.

The HRQoL value in the plaque psoriasis subgroup was 0.83 (95% CI: 0.78-0.88), with significant heterogeneity between these studies (I^2=98.0%), similar to the finding reported by Z. Yang, et al. (2020) [8] with a value of 0.82 (95% CI: 0.76-0.89). The value in patients with psoriatic arthritis was 0.68 (95% CI: 0.64-0.72), lower than the value of 0.76 (95% CI: 0.72-0.80) in Z. Yang, et al. (2020)'s meta-analysis, which can be explained by the previous study including only one study compared to 10 studies reported in our analysis [8]. Additionally, the value in psoriatic arthritis patients was lower than in the general psoriasis population at 0.73 (95% CI: 0.68-0.79), consistent with the results reported by C.F. Rosen, et al. (2012) [51]. Another finding was that psoriatic arthritis patients had statistically significantly lower HRQoL than plaque psoriasis patients (p<0.0001), similar to the finding of Z. Yang, et al. (2020) [8].

According to the NICE recommendation, mapping techniques are used to estimate HRQoL values derived from the EQ-5D-5L instrument when EQ-5D data are not available [52]. In addition, a previous meta-analysis included studies reporting HRQoL obtained through mapping techniques only when it was performed by the authors of the accompanying publications [8]. Another study, by N. Luo, et al. (2015) [53], on breast cancer patients demonstrated that the mapping function could generate EQ-5D-5L values equivalent to those obtained from direct valuation of HRQoL. Therefore, this systematic review and meta-analysis included studies reporting HRQoL values derived from EQ-5D-5L using mapping techniques from the EQ-5D-3L: two studies in the UK (2013, 2017) and one study in China (2019).

This systematic review and meta-analysis had several strengths. Our review included a large number of studies and patients from different countries and regions, enhancing the generalisability and reliability of the results. Additionally, appropriate statistical methods were employed to assess heterogeneity, publication bias, and sensitivity, thereby enhancing the reliability and transparency of the analysis. This systematic review and meta-analysis was the first study to compare HRQoL values derived from EQ-5D-5L in Asian psoriatic patients with those in other regions.

There were certain limitations to our study. Firstly, this systematic review and meta-analysis included only studies using the EQ-5D-5L to measure HRQoL values in psoriatic patients, potentially excluding studies using different tools or methods, which could limit the comparability and applicability of the results to other populations or contexts. The inclusion of studies with small sample sizes, which did not meet the sample size recommendation of 100 or more according to E.W. Steyerberg (2009) [54], may have led to higher variability in results and inconsistencies in the data. The study did not perform meta-regression or network meta-analysis to explore the sources of heterogeneity or compare the effects of different interventions on patients' quality of life, which could limit the practical value and policy implications of the results. Furthermore, the limited number of studies conducted in Asia resulted in the subgroup analysis of Asian populations including both plaque psoriasis and psoriatic arthritis, potentially compromising the reliability and applicability of the results to different disease types.

Currently, Asian countries such as Japan, China, Thailand, and Vietnam have recognised the importance of applying healthcare technology to assess the value and effectiveness of new treatment methods [55-58]. In national guidelines on Health Technology Assessment (HTA), EQ-5D-5L has been identified as a critical tool for measuring HRQoL to incorporate into economic analyses to calculate quality-adjusted life year outcomes. Therefore, the systematic review and meta-analysis of HRQoL derived from EQ-5D-5L in psoriatic patients will provide important information in evaluating and comparing the benefits and application in the decision-making process on the use of new technologies in psoriasis treatment.

5. Conclusions

In summary, this systematic review and meta-analysis provide comprehensive and updated estimates of HRQoL values derived from EQ-5D-5L in psoriatic patients. The study showed that EQ-5D-5L values can vary according to psoriatic patient groups; in particular, patients with psoriatic arthritis had a lower value than patients with plaque psoriasis. This study had strengths and limitations that should be considered when interpreting and applying the results. Our systematic review and meta-analysis will provide useful information for future economic evaluations of psoriasis treatments.

CRediT author statement

Minh Anh Hoang: Project administration, Conceptualisation, Methodology, Data curation, Resources, Formal analysis, Visualisation, Writing original draft, Reviewing and Editing; Nu Hanh Van Pham: Conceptualisation, Methodology, Writing original draft; Hai Linh Tran: Investigation, Writing - Reviewing and Editing; Ngoc Tram Doan: Investigation, Writing - Reviewing and Editing; Phuong Anh Dong: Validation, Writing - Reviewing and Editing.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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