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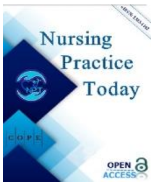

Review Article

Dermatology life quality index in vitiligo patients: A systematic review and meta-analysis of observational studies

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ABSTRACT

Background & Aim: Vitiligo is a chronic and unpredictable condition. The absence of effective treatments, coupled with fears of rejection and stigma, can adversely affect patients' coping abilities and their social and psychological adjustment. This study aimed to assess the overall quality of life score of vitiligo patients using DLQI to evaluate the disease's impact on their quality of life.

Methods & Materials: This meta-analysis adhered to PRISMA 2020 guidelines and thoroughly searched the PubMed, EMBASE, Web of Science/ISI, and Scopus databases from their inception to January 2023. All observational studies reporting the quality of life score based on the DLQI were included in the analysis. Heterogeneity among the studies was assessed using the I2 index and Cochrane's Q-statistic. Data were analyzed using the random effects model using STATA software version 12.

Results: Our analysis included a total of 58 studies involving 9277 individuals. The pooled DLQI score was 8.07 (95% CI: 7.22-8.91). The lowest and highest scores were observed in Europe (5.52, 95% CI: 4.18-6.87) and Africa (10.95, 95% CI: 7.77-14.15), respectively. The DLQI score was 7.17 (95% CI: 6.04-8.31) in men and 8.63 (95% CI: 7.44-9.82) in women. No significant correlation was found between the DLQI score and the publication year of the articles (p=0.219), patients' age (p=0.119), and disease duration (p=0.203).

Conclusion: Vitiligo moderately impacts patients' quality of life. Therefore, it seems necessary to provide psychological and social training for these patients.

Introduction

Vitiligo is a chronic depigmentation disorder that causes the formation of white patches on the skin due to the destruction of epidermal melanocytes (1). Vitiligo has affected 1-2% of the population worldwide (2) and has a multifactorial pathogenesis involving environmental, genetic, and autoimmune factors (3). There is no cure for vitiligo, and the current treatment methods aim to control the disease progression and restore pigmentation. However, vitiligo is unpredictable and often resistant to treatment (4).

Vitiligo is not life-threatening, but it can have a significant impact on a person's appearance, which may lead to psychological distress, such as embarrassment, humiliation, fear of rejection, and social isolation (5). A recent meta-analysis has shown that patients with vitiligo have five times more depressive symptoms than healthy people (6). The chronic and unpredictable nature of the disease and the lack of effective treatment options challenge patients' ability to cope and adapt socially and psychologically (7). Vitiligo can also affect intimate relationships and marriages due to the fear of rejection and stigma (8). The severity of vitiligo's impact on the quality of life depends on the skin color contrast between normal and depigmented areas (9). Vitiligo is more apparent in patients with darker skin tones, which may

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increase their desire to conceal the affected areas with makeup or clothing (3, 8). Therefore, it is essential to evaluate the effect of vitiligo on patients' quality of life (5). Vitiligo affects men and women equally, but its impact varies between sexes. Women with vitiligo often experience a lower quality of life and more severe psychiatric symptoms than men (10).

There are various dermatology-specific instruments to describe the impact of skin diseases on the quality of life, such as Dermatology-specific Quality of Life instrument (11), Skindex (12), Dermatology Quality of Life Scales (13), Impact of Chronic Skin Disease on Daily Life (14), and Dermatology Life Quality Index (DLQI) (15). The DLQI is the most widely used instrument to assess the impact of skin diseases on patients' quality of life compared to other quality-of-life instruments due to its simplicity, comprehensiveness, and practicality (15, 16). It has been used in more than 40 different skin diseases in over 80 countries and is available in more than 90 languages (17, 18). Furthermore, a systematic review of quality-of-life measurement instruments for patients with vitiligo showed that DLQI has good internal consistency (19). Pattinson et al. (2021) systematically reviewed the quality of life instruments in dermatology based on the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) criteria. The results showed that all versions of the DLQI instrument (Chinese, Italian, Norwegian, Turkish, Ukrainian, and Danish versions) can be potentially used, but need further validation. Based on the evaluations, the Sinhala version was not recommended for use (20). However, different studies have reported inconsistent results regarding the DLQI score of vitiligo patients. Thus, a systematic review of previous studies can provide a clear picture of the quality of life of these patients. This study aimed to evaluate the DLQI score of vitiligo patients.

Methods

This systematic review and meta-analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) 2020 checklist (21). The protocol of this study is not registered in PROSPERO.

Table 1. The characteristics of the included studies

First author	Year	Mean age	Type of study	Sample size (F/M)	Country	DLQI score		Quality
						Total	M/F	
Rao (48)	2022	34.5±11.5	Cross-Sectional	108	India	6.73±3.75	-	Moderate
Yang (49)	2022	44.9 ± 14.8	Cross-Sectional	143	Taiwan	5.32 ± 4.67	-	Moderate
Hussain (50)	2022	29.2±9.1	Cross-Sectional	125	Pakistan	9.7±5.9	-	Moderate
Baidya (51)	2021	-	Cross-Sectional	80(48/32)	India	9.68 ± 5.24	-	High
Hooshmand (33)	2021	27.8 ± 10.7	Descriptive	170(101/6)	Afghanistan	9.72 ± 5.82	F: 9.9±4.64 M: 9.42 ± 6.11	Moderate
Benny (26)	2021	-	Cross-Sectional	60(32/28)	India	-	F: 7.8 ± 5.6 M: 6.5 ± 4.8	poor
Atis (52)	2021	39 ± 14.8	Cross-Sectional	46	Turkey	9.4 ± 4.9		Poor
Nazar (46)	2021	30 ± 10.4	Cross-Sectional	120(84/36)	India	15.1 ± 4.21	F:13.41 ± 5.31 M:10.21± 5.1	Moderate
Agarwal (53)	2021	30.2 ± 14.8	Cross-Sectional	150(78/72)	India	13.75 ± 6.69	-	Moderate
Lacerda (29)	2020	-	Case-Control	51	Brazil	4.7 ± 5.8	-	Moderate
Dabas (54)	2020	-	Cross-Sectional	95	India	10.25 ± 6.65	-	High
Al-Dabbagh (55)	2020	31.8 ± 10.4	Cross-Sectional	143 (67/76)	Iraq	6.67 ± 4.81	-	Moderate
Abdelmaguid (56)	2020	32.8 ± 13	Cross-Sectional	100(76/24)	Egypt	19.70 ± 5.5	-	Poor

First author	Year	Mean age	Type of study	Sample size (F/M)	Country	DLQI score		Quality
						Total	M/F	
Silpa-Archa (3)	2020	41.5 ± 15.9	Cross-Sectional	104(73/31)	Thailand	7.46 ± 6.06	F: 7.89 ± 6.04 M: 6.45 ± 6.10	High
Anaba (57)	2020	-	Cross-Sectional	42	Nigeria	5.7 ± 6.8	-	Moderate
Belgaumkar (2)	2020	38.3 ± 16.3	Cross-Sectional	60 (36/24)	India	3.15 ± 4.2	-	Poor
Amatya (39)	2019	30 ± 12.9	Cross-Sectional	100 (50/50)	Nepal	4.13 ± 3.74	F: 3.98 ± 3.52 M: 4.27 ± 3.95	Poor
Sawant (45)	2019	-	Cross-Sectional	100 (44/56)	India	10.71 ± 7.82	F:11.97 ±7.60 M:10.71 ±7.82	High
Gupta (58)	2019	28.9 ± 10.5	Cross-Sectional	391 (169/222)	India	7.8 ± 6.6		High
Kota (42)	2019	-	Cross-Sectional	150 (83/67)	India	7.02 ± 5.58	F: 6.98 ± 5.44 M: 7.07 ± 5.78	High
Hammam (40)	2019	26.2 ± 12.4	Cross-Sectional	203 (152/51)	Egypt	5.80 ± 5.04	F: 6.68 ± 5.31 M: 3.16 ± 2.82	Moderate
Temel (59)	2019	34.3 ± 13	Cross-Sectional	50 (24/26)	Turkey	4.70 ± 5.33	-	High
Hassanin (60)	2018	-	Cross-Sectional	22	Egypt	12.36 ± 5.64	-	High
Xu (61)	2017	48.2 ± 17.8	Cross-Sectional	37 (20/17)	Korea	4.49 ± 3.97	-	Moderate
Morales-Sánchez (62)	2017	30 ± 20	Cross-Sectional	150 (103/47)	Mexico	5.2 ± 5.4	-	Poor
Sarhan (38)	2016	32.4 ± 7.5	Cross-Sectional	25	Egypt	14 ± 2.15	-	High
		30.3 ± 5.04		25		12 ± 3.10		High
Salman (63)	2016	31.8 ± 9.7	Cross-Sectional	37(20/17)	Turkey	5.6 ± 5.1	-	High
Ezzedine (64)	2015	48.9 ± 16.2	Cross-Sectional	261	France	8.7 ± 6.2	-	Poor
Sangma (44)	2015	29.7 ± 7	Cross-Sectional	100 (59/41)	India	9.08 ± 4.46	F:10.78 ± 3.78 M: 6.63 ± 4.26	Poor
Eltaher (28)	2015	37.7 ± 11.2	Case-Control	95(59/36)	Egypt	12.3 ± 6.1	-	High
Aradhya (65)	2015	35.2 ± 14.7	Cross-Sectional	300(158/142)	India	6.71 ± 6.86	-	High
Ingordo (66)	2014	41.1 ± 13.6	Cross-Sectional	161	Italy	4.3 ± 4.9	-	High
Mishra (27)	2014	29.3 ± 12.9	Cross-Sectional	100(49/5)	India	-	F: 6.30 ± 5.18 M: 7.39 ± 5.74	Poor
Ghaderi (67)	2014	-	Cross-Sectional	70	Iran	8.40 ± 5.76	-	High
Yanik (68)	2014	43.6 ± 13.5	Cross-Sectional	57(32/25)	Turkey	7.57 ± 4.45	-	High
Gupta (69)	2014	29.8 ± 10.6	Cross-Sectional	161(64/9)	India	8.25 ± 6.93	-	Moderate
Kaçar (70)	2014	-	Cross-Sectional	38	Turkey	6.02 ± 2.55	-	Moderate
Senol (5)	2013	36.2 ± 13.2	Cross-Sectional	183 (96/8)	Turkey	15 ± 4.6	-	Moderate
Kiprono (9)	2013	41 ± 18.3	Cross-Sectional	88	Tanzania	7.2 ± 4.8	-	Poor
Bin Saif (35)	2013	30.3 ± 13	Prospective	141 (72/6)	Saudi Arabia	9 ± 6.5	-	Moderate
Fawzy (36)	2013	32 ± 11.7	Prospective	104	Egypt	9.52 ± 5.88	F: 9.7 ± 6.53	Poor

First author	Year	Mean age	Type of study	Sample size (F/M)	Country	DLQI score		Quality
						Total	M/F	
				(69/35)			M: 9.17 ± 4.38	
Silverberg (37)	2013	43.1 ± 13.4	Prospective	1541	USA	5.9 ± 5.5	-	Moderate
Chan (32)	2013	-	Descriptive	222	Singapore	4.0 ± 4.4	-	Moderate
Ghajarzadeh (41)	2012	28.9 ± 11.5	Cross-Sectional	100 (50/50)	Iran	8.4 ± 6.9	F: 9.8 ± 7.3 M: 7 ± 6.2	Moderate
Wong (71)	2012	43.6	Cross-Sectional	102	Malaysia	6.4 + 5.17	-	Moderate
Chan (31)	2012	47.5 ± 15	Descriptive	145 (73/72)	Singapore	4.4 ± 4.5	-	High
Ingordo (72)	2011	19 ± 1.1	Cross-Sectional	47	Italy	1.82 ± 2.95		High
Zandi (47)	2011	27.8±10.9	Cross-Sectional	124 (68/56)	Iran	9.09 ± 6.2	F: 8.78 ± 5.81 M: 9.46 ± 6.64	Moderate
Wang (30)	2011	30.8 ± 7.1	Case-Control	101	China	8.41 ± 7.31	-	Moderate
Mashayekhi (34)	2010	-	Descriptive	83 (51/32)	Iran	7.54 ± 4.97	F: 8.6 ± 5.2 M: 5.8 ± 4.1	Moderate
Radtke (43)	2009	44.4 ± 14.2	Cross-Sectional	1023 (594/4)	Germany	7 + 5.9	F: 7.5 ± 5.9 M: 5.5 ± 5.3	Moderate
Kostopoulou (73)	2009	43.9 ± 14.5	Cross-Sectional	48 (31/17)	France	7.17 ± 4.80	-	Poor
Dolatshahi (74)	2008	-	Cross-Sectional	100 (64/36)	Iran	8.16 ± 5.42	-	Moderate
Al Robaee (75)	2007	26.9 ± 9.7	Cross-Sectional	109 (48/61)	Saudi Arabia	14.72 ± 5.17	-	Moderate
Ongenae (76)	2008	41.4	Cross-Sectional	102 (56/46)	Belgium	4.95 ± 2.3	-	High
Aghaei (77)	2004	28.3 ± 11.1	Cross-Sectional	70 (43/27)	Iran	7.05 ± 5.13	-	Moderate
Kent (78)	1996	-	Cross-Sectional	614	UK	4.82 ± 4.84	-	High

F: Female; M: Male

Search strategy

We searched four international databases, Scopus, EMBASE, ISI, and PubMed, using the keywords “vitiligo” OR “vitiligo*” OR “leukoderma” AND “Quality of Life” OR “Life Quality” OR “HRQOL” OR “Health-Related Quality of Life” from inception until January 2023. The references of selected articles were also reviewed to identify additional relevant studies. In addition, Google and Google Scholar were also searched for additional sources. Two independent authors performed all the steps of searching and screening the articles and resolved any disagreement by discussion.

Inclusion and exclusion criteria

The inclusion criteria were observational studies published in English that reported the raw quality of life scores (mean and standard deviation) of vitiligo patients based on the DLQI and included patients aged over 16 years. DLQI is designed to assess the quality of life in vitiligo patients aged 16 and older, so only observational studies involving this age group were included in the analysis. The exclusion criteria were interventional, review, and qualitative studies. This study aimed to estimate the pooled quality of life score of patients with vitiligo. Therefore, observational studies that did not report the raw quality of life score were excluded from the analysis. Interventional studies were not included in the analysis due to the nature of the study and the small number of samples. Studies that evaluated the quality of life of vitiligo patients' families or children were also excluded.

Outcome

The main outcome of this study was the raw quality of life score based on the DLQI. The DLQI is a questionnaire that measures six dimensions of quality of life-related to skin diseases, including symptoms and feelings, daily activities, leisure, work and school, personal relationships, and treatment. Each question is scored on a scale from 0 to 3, with possible responses as follows: 0= Not at all; 1= A little; 2= A lot; 3= Very much. The maximum possible score is 30 (if all 10 questions are answered as "Very much"). Total Score Interpretation: 0–1: No effect on patient's life; 2–5: Small effect on patient's life; 6–10: Moderate effect on patient's life; 11–20: Very large effect on patient's life; 21–30: Extremely large effect on patient's life (15).

Data extraction

The required information from the retrieved literature, such as the first author, publication year, sample size, mean age of the patients, study area, disease duration, and mean and standard deviation of the DLQI score, was extracted and recorded in a pre-prepared form. To minimize bias two researchers independently conducted all these steps, and any disagreements were resolved by consultation and discussion.

Quality assessment

Systematic reviews and meta-analyses are considered the highest level of evidence in science. Therefore, the quality of the studies included in them should be accurately evaluated by valid and standard scales. Unlike interventional studies, the scales for evaluating the methodological quality of articles are limited (22). The Newcastle-Ottawa Scale (NOS) is a widely used scale to assess the quality of observational studies included in systematic reviews and meta-analyses. The NOS is easy to use and its indicators (selection, comparability, and outcome) are compatible with most investigated topics (23). A score of 0 to 3 indicates low quality, 4 to 6 indicates average quality, and 7 to 9 indicates high quality (24). The methodological evaluation of the articles was conducted by two independent researchers, with any disagreements resolved through discussion.

Statistical analysis

The variance for each study was calculated assuming a normal distribution for the mean quality of life scores of vitiligo patients. The weight assigned to each study was determined proportionally to its inverse variance. To assess the heterogeneity of the data, both the I^2 index and Cochrane's Q-statistic were utilized. Heterogeneity was categorized as low ($I^2 < 50\%$), moderate ($50 \leq I^2 \leq 75\%$), and high ($I^2 > 75\%$) (25). For studies with an I^2 index higher than 50% or a p-value associated with Cochrane's Q less than 0.1, random effects models were employed for pooling. In this study, the random effects model was used for all analyses. Meta-regression analysis was conducted to investigate the relationship between the DLQI score and the publication year, disease duration, and mean age of patients across the selected studies. Subgroup analysis was used to evaluate vitiligo patients' quality of life scores based on the methodological quality and continents. Publication bias was also assessed using Egger's asymmetry regression test and its related graph. Sensitivity analysis using the leave-one-out method was employed to ensure the stability of the pooled quality-of-life scores. Data analysis was conducted using STATA version 12 software, with a significance level set at 0.05.

Results

A total of 2,542 studies were initially identified through the search, and after removing duplicates, 1,299 studies remained. Subsequently, 1,185 studies were excluded as they were deemed irrelevant. The full text of the remaining 114 studies was reviewed, and 56 studies were excluded either for not reporting DLQI scores or for utilizing alternative tools to measure quality of life. Ultimately 58 studies involving 9,277 participants were included in the analysis. The flowchart illustrating the screening and selection process of articles can be found in Figure 1.

Summary of included studies

All the analyzed articles were written in English and published in 25 countries (India, Taiwan, Pakistan, Afghanistan, Turkey, Thailand, Iraq, Nepal, Singapore, China, Malaysia, Saudi Arabia, Iran, Korea, Belgium, England, Germany, Italy, France, Tanzania, Nigeria, Egypt, Mexico, Brazil, and the USA) from 1996 to 2022. The most common years of publication were 2013 and 2019, with six studies each. The mean age of patients was reported in 43 studies, ranging from 19 to 48.9 years. Most studies were conducted in India, Iran, and Turkey, respectively.

In the included studies, the overall quality of life score was reported; however, two studies presented the score separately by gender instead of providing a total score (26, 27). Three studies were case-control studies (n=247 patients) (28-30), four were descriptive studies (n=620 patients) (31-34), and three were prospective studies (n= 1786) (35-37).

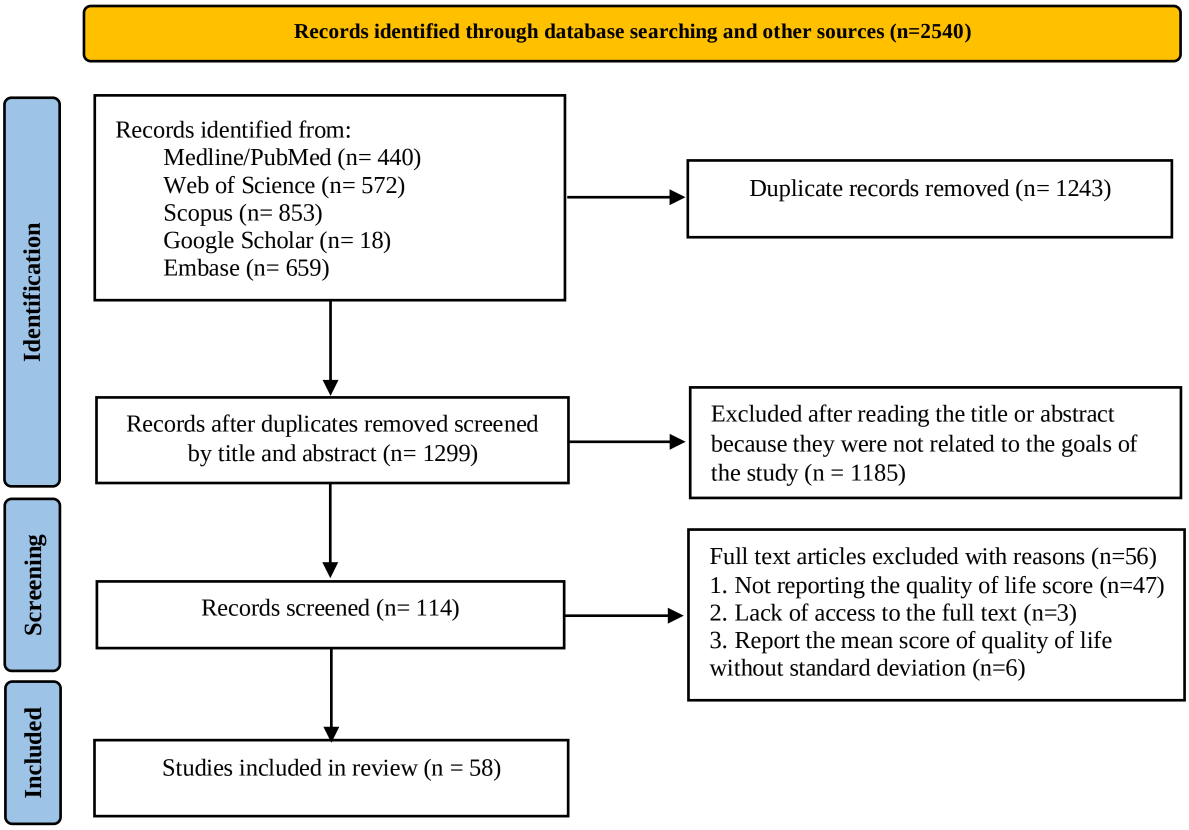

Figure 1. PRISMA 2020 flow diagram

The remaining studies were all cross-sectional. In a study, patients were divided into two groups based on genital involvement, and DLQI scores were reported separately for each group: those with genital lesions and those with lesions in other body areas (38). Fifteen studies reported overall quality of life scores, including those by gender, and the DLQI score of men and women ranged from 3.16 to 10.71 and from 3.98 to 13.41, respectively (3, 26, 27, 33, 34, 36, 39-47) (Table 1). The disease duration in analyzed studies was 4.31 to 20.30 years, and regarding the methodological quality, 20 articles were good, 26 were moderate, and 10 were poor.

Pooled and stratified DLQI score

The DLQI score in the included studies varied between 1.82 and 19.7, and the pooled DLQI score was 8.07 (95% CI: 7.22-8.91), out of 30 scores. There was high heterogeneity between studies (I^2=98.4%, $p<0.001$). Subgroup analysis was performed by continent and methodological quality. The combined DLQI scores for vitiligo patients varied by continent, with Europe showing the lowest score of 5.52 (95% CI: 4.17-6.86) and Africa the highest at 10.96 (95% CI: 7.77-14.15), indicating that European patients had a better quality of life than their African counterparts.

The pooled DLQI score in the studies conducted in Asia and America was 8.08 (95% CI: 7-9.17) and 5.53 (95% CI: 4.86-6.18), respectively. Regarding the methodological quality, the pooled DLQI score was 7.80 (95% CI: 6.46-9.13) in good quality studies, 8.17 (95% CI: 6.95-9.37) in moderate quality studies, and 8.06 (95% CI: 7.22-8.91) in poor quality studies. The pooled DLQI score was 7.17 (95% CI: 6.04-8.31) in men and 8.63 (95% CI: 7.44-9.82) in women (Table 2, Figures 2 and 3).

Table 2. The DLQI score of vitiligo patients by continent and methodological quality

Subgroup		Number of studies	Pooled score (95% CI)	I^2	Q	P
Continent	Asia	37	8.08 (7-9.17)	97.9	1753.10	0.001
	Europe	7	5.52 (4.17-6.86)	97.5	240.46	0.001
	Africa	9	10.96 (7.77-14.15)	98.7	604.43	0.001
	America	3	5.52 (4.86-6.18)	52.3	4.19	0.123
Methodological quality	High	20	7.80 (6.46-9.13)	97.9	920.05	0.001
	Moderate	26	8.17 (6.95-9.37)	98.5	1655.13	0.001
	Low	10	8.06 (7.22-8.91)	98.7	702.46	0.001

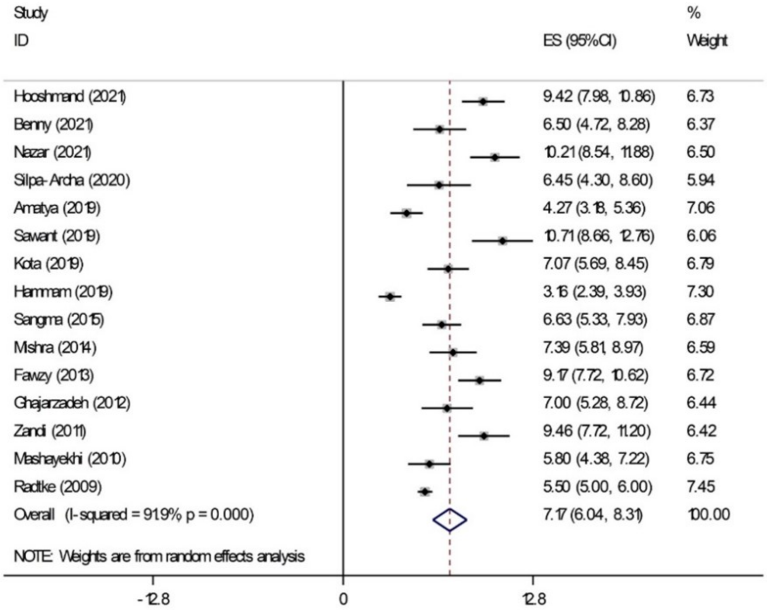

Figure 2. Forest plot for meta-analysis of quality of life scores in men with vitiligo

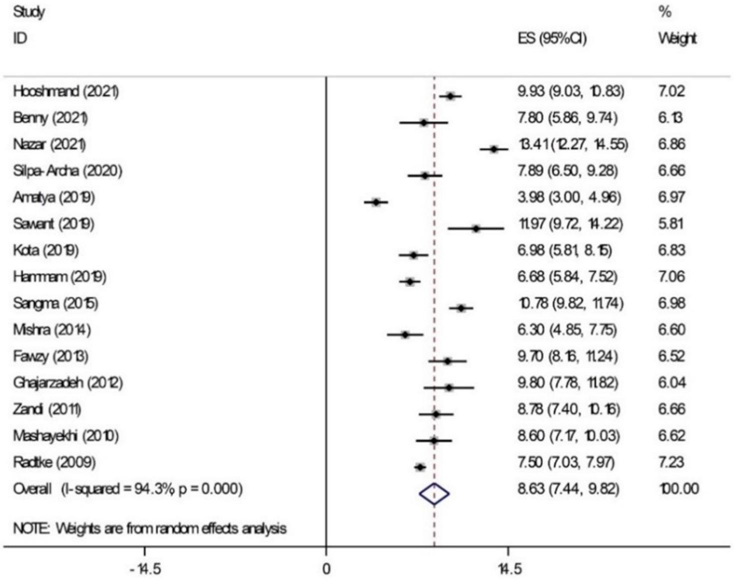

Figure 3. Forest plot for meta-analysis of quality of life scores in women with vitiligo

Regression analysis, sensitive analysis, and publication bias

The meta-regression analysis revealed that the DLQI scores had a downward trend with the increase in the duration of vitiligo, which was insignificant (p=0.203). In addition, the DLQI score had an upward but insignificant trend with the rise in the average age of the patients (p=0.119). There was no relationship between the DLQI score and the year of publication of the articles (p=0.219). The sensitivity analysis results using the leave-one-out method also showed the stability of the results. In other words, no single study significantly affected the pooled estimation of the DLQI scores. Additionally, the results of Egger's regression test indicated a significant publication bias among the included studies (p=0.009) (Figure 4).

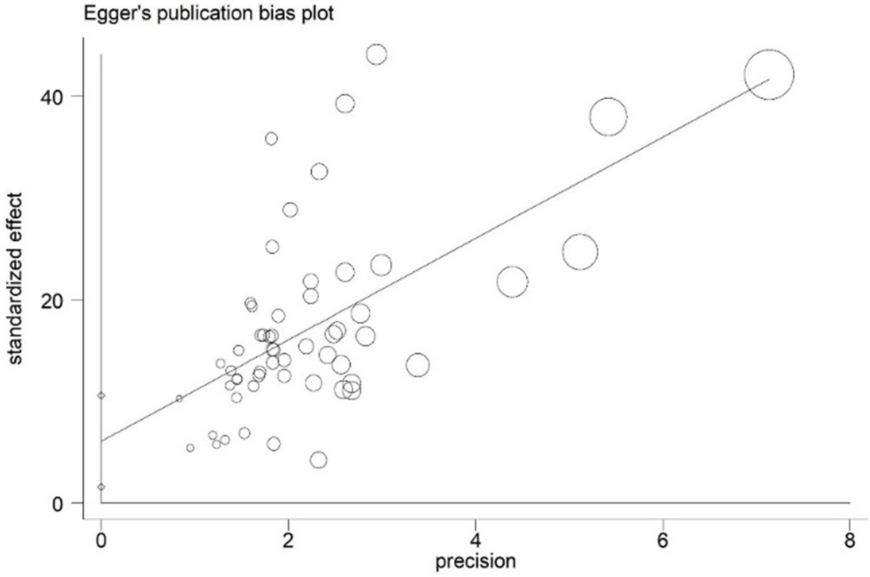

Figure 4. Publication bias

Discussion

This meta-analysis aimed to evaluate the quality of life (QoL) in vitiligo patients using the Dermatology Life Quality Index (DLQI), synthesizing data from 58 studies with a total of 9,277 participants. The pooled DLQI score of 8.07 (95% CI: 7.22–8.91) indicates a moderate impact of vitiligo on patients' lives, which aligns with previous literature suggesting that vitiligo adversely affects various aspects of daily living, including emotional well-being and social interactions (15, 79).

One of the key findings of this analysis was the geographical variation in DLQI scores. The lowest pooled score was observed in Europe (5.52, 95% CI: 4.17–6.86), while the highest was reported in Africa (10.96, 95% CI: 7.77–14.15), highlighting significant continental differences in the impact of vitiligo on QoL. This disparity may be influenced by socioeconomic factors, healthcare access, and cultural perceptions of skin diseases. For instance, African patients, particularly those with darker skin tones, may experience more visible lesions, which could exacerbate the psychological burden due to heightened social stigma (43). In contrast, European patients might benefit from better healthcare resources, support systems, and greater public awareness, potentially contributing to a lower DLQI score.

The DLQI scores also varied by gender, with women reporting a significantly higher impact on QoL (8.63, 95% CI: 7.44–9.82) than men (7.17, 95% CI: 6.04–8.31). This finding is consistent with existing literature which suggests that women often face greater societal pressures related to physical appearance (80). Additionally, cultural and gender-specific norms may further amplify the emotional and psychological distress experienced by women with visible vitiligo lesions. Interestingly, no significant association was found between DLQI scores and the duration of vitiligo, as indicated by the meta-regression analysis (p=0.203). This suggests that the negative impact of vitiligo on QoL does not diminish over time, which contradicts the notion that patients might adapt to the disease after prolonged exposure. Instead, the chronic, relapsing nature of vitiligo may continuously hinder patients' ability to cope with the condition, maintaining a persistent impact on their QoL (37). Similarly, the analysis revealed no significant correlation between DLQI scores and the average age of patients (p=0.119), implying that vitiligo affects QoL across all age groups. Younger individuals might be as vulnerable to social stigma and emotional distress as older patients, despite differences in life experiences and coping mechanisms. This finding underscores the universal psychosocial impact of vitiligo, irrespective of patient demographics (78).

The heterogeneity observed in this meta-analysis (I^2= 98.4%, p< 0.001) was notably high, reflecting substantial variability in the study populations, methodologies, and cultural contexts of the included studies. This is not uncommon in QoL studies, particularly when examining a global condition like vitiligo that varies significantly by region. Subgroup analyses by continent and methodological quality provided insight into some of these differences. However, further research is needed to explore additional factors contributing to this heterogeneity, such as differences in healthcare access, cultural stigmas, and patient expectations. Another critical aspect of this study was the identification of publication bias, as indicated by Egger's regression test (p= 0.009). This bias may stem from the tendency of studies with significant or positive findings to be more frequently published than those with negative or non-significant results. The predominance of English-language studies could also contribute to this bias, potentially limiting the generalizability of the findings. Despite this limitation, sensitivity analyses confirmed the stability of the pooled DLQI estimates, reinforcing the robustness of the results. The strength of this study was the focus on studies that examined the quality of life with a special scale. However, The limitation of this study was the lack of reporting of DLQI dimensions in the included studies. Most studies did not report the quality of life score by dimensions, focusing instead on the overall score. Another limitation of this study is the high heterogeneity among its participants. Given its global scope and the diverse cultural and demographic backgrounds of the large patient population, this variability was anticipated. Therefore, it was not possible to further explore the different dimensions of DLQI.

Conclusion

In conclusion, this meta-analysis highlights the substantial impact of vitiligo on the quality of life of affected individuals, with notable variations across gender and geographical regions. Female patients and those from African countries experience a greater decline in QoL, which may be influenced by cultural perceptions and societal expectations. While the study's findings emphasize the chronic and persistent burden of vitiligo on patients' lives, further research is needed to address the limitations associated with publication bias and heterogeneity. Improving public awareness, reducing stigma, and ensuring better healthcare access could mitigate the negative impact of vitiligo on QoL, especially in regions where patients are most affected.

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Conflict of interest

The authors have stated that there is no conflict of interest.

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