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Systematic Review

The Dermatology Life Quality Index as the primary outcome in randomized clinical trials: a systematic review

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Abstract

Background Primary endpoint measures in clinical trials are typically measures of disease severity, with patient-reported outcome measures (PROMs) relegated as secondary endpoints. However, validation of some PROMs may be more rigorous than that of disease severity measures, which could provide support for a primary role for PROMs.

Objectives This study reports on 24 peer reviewed journal articles that used the Dermatology Life Quality Index (DLQI) as primary outcome, derived from a systematic review of randomized controlled trials (RCTs) utlizing DLQI, covering all diseases and interventions.

Methods The study protocol was prospectively published on the PROSPERO database, and the study followed PRISMA guidelines. Searches were made using MEDLINE, The Cochrane Library, Embase, Web of Science, Scopus, CINAHL (EBSCO) and PsycINFO databases and records were combined into an Endnote database. Records were filtered for duplicates and selected based on study inclusion/exclusion criteria. Full-text articles were sourced and data were extracted by two reviewers into a bespoke REDCap database, with a third reviewer adjudicating disagreements. The Jadad scoring method was used to determine risk of bias.

Results Of the 3220 publications retrieved from online searching, 457 articles met the eligibility criteria and included 198 587 patients. DLQI scores were used as primary outcomes in 24 (5.3%) of these studies comprising 15 different diseases and 3436 patients. Most study interventions (17 of 24 studies, 68%) were systemic drugs, with biologics (liraglutide, alefacept, secukinumab, ustekinumab, adalimumab) accounting for 5 of 25 pharmacological interventions (20%). Topical treatments comprised 32% (8 studies), whereas nonpharmacological interventions ($n=8$) were 24% of the total interventions ($N=33$). Three studies used nontraditional medicines. Eight studies were multicentred (33.3%), with trials conducted in at least 14 different countries, and four studies (16.7%) were conducted in multiple countries. The Jadad risk of bias scale showed that bias was uncertain or low, as 87.5% of studies had Jadad scores of ≥ 3.

Conclusions This study provides evidence for use of the DLQI as a primary outcome in clinical trials. Researchers and clinicians can use this data to inform decisions about further use of the DLQI as a primary outcome.

Lay summary

Measuring the quality of life (QoL) of people with skin diseases during controlled studies is normally done by groups of researchers and clinicians. To determine how much a skin disease affects a person's QoL, information on the patient and the severity of their skin condition is collected using laboratory measurements, and/or looking at the skin.

Asking patients to self-report the impact of their skin condition using questionnaires they have completed themselves has usually been of secondary importance, even though these questionnaires can often be much more reliable. However, patient-reported outcomes are now being used more often as primary measures in controlled studies. Self-report measures can provide information on how effective treatment is, which can help government agencies to approve new products and justify claims made by drug companies.

This study reports on 24 academic studies that used the Dermatology Life Quality Index (DLQI) (a type of self-report measure for dermatology patients) as a primary tool of measurement in controlled trials for a range of different skin diseases and treatments.

Our study findings are important, as researchers and clinicians can use this data to help make decisions regarding use of the DLQI.

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What is already known about this topic?

- In dermatology, quality-of-life (QoL) measures in clinical trials have mostly been used as secondary outcome measures, despite the fact that validation of QoL measures can often be more extensive than other disease severity measures.
- Patient-reported outcomes are now being considered as primary measures for phase III trials to evaluate the intervention effectiveness, and to support registration of clinical trials, product approvals and labelling claims.

What does this study add?

- This study provides evidence of the use of DLQI as a primary outcome in clinical trials.
- Researchers and clinicians can use this data to inform decisions about further use of the DLQI as a primary outcome.

Until recently, quality-of-life (QoL) measures in dermatology have mostly been used as secondary outcome measures in clinical trials, despite the fact that validation of QoL measures can often be more extensive than other disease severity measures. However, in some other fields of medicine, in particular rheumatology,[1] gastroenterology[1] and oncology,[2] patient-reported outcomes (PROs) are increasingly being used as primary outcome measures, reflecting the growing awareness and acceptance of the key importance of the patient's perspective in assessing interventions. There has been scant evidence of such emphasis in dermatology, even though PROs are extensively used clinically in dermatology and embedded in guidelines and registries worldwide.[3]

The data gathered in a systematic review of the use of the Dermatology Life Quality Index (DLQI) in randomized controlled trials (RCTs)[4] have now been used to identify and describe the use of the DLQI as a primary outcome in RCTs. The reason for this study is to encourage the use of PROs in dermatology and to provide confidence to researchers when considering the use of such PROs as primary outcomes in future studies.

PROs are often used in registration of clinical trials to support product approvals, labelling claims and in support of primary clinical outcomes. PROs can increase the relevance of clinical trials[5,6] and improve patient outcomes in real-world treatment.[7,8] PRO trial data have the potential to inform shared decision making, support pharmaceutical labelling claims and influence healthcare policy.[9] Many studies have investigated the application of PROs as nonprimary outcomes in clinical trials.[10,11] Earlier guidelines on the reporting of PROs in clinical trials[12–14] have been extended,[15,16] and a recommendation has been published for including PRO outcomes in grant applications.[17] PROs may be used as primary, coprimary or secondary outcomes or as exploratory endpoints.[18,19]

The first report of an RCT in which QoL measures were used as a primary outcome was a study on antihypertensive therapy.[20] It demonstrated economic impact and generated interest from the pharmaceutical industry to include similar outcome measures in clinical studies to support new drug approval or QoL claims in promotional materials.[21]

PRO primary outcomes are now being considered as essential for phase III trials to evaluate the intervention effectiveness.[22–24] The DLQI has become the single most widely used PRO measure in dermatological studies. Published in 1994 as the first dermatology-specific QoL instrument,[25] it has been increasingly adopted owing to its measurement properties, simplicity and ease of use. In this article, we report on 24 studies that used the DLQI as the primary outcome in dermatological studies, derived from a systematic review of 457 RCTs covering all skin diseases and interventions.[4] This is the first reported review of PROs primary outcomes in dermatology.

Materials and methods

Data sources

The methodology of the systematic review from which this further analysis is derived has been previously published.[4] This study followed 2020 PRISMA guidelines for reporting systematic reviews.[26] The study protocol (CRD42021290587) and detailed search strategy[27] were published on the PROSPERO Prospective Register of Systematic Reviews.[28] MEDLINE (Ovid), The Cochrane Library, Embase, Web of Science, Scopus, CINAHL (EBSCO) and PsycINFO online databases from 1 January 1994 (year of DLQI publication)[25] to 16 November 2021 were searched independently by two authors (J.R.J., J.V.), and the results were coordinated. Search terms included 'DLQI' and 'dermatology life quality index'. Database-specific 'article type/study type' keywords, language keywords (English) and age-selection keywords were also used to search the required types of study to be included, e.g. Medical Subject Headings terms for RCTs. Duplicates were excluded.

Search strategy/selection

A set of eligibility criteria were applied for selection of the included studies (Table 1).

Search results were imported into EndNote20® (Clarivate, Philadelphia, PA, USA) to keep track of references.[29] Two authors (J.R.J., J.V.) independently compared study titles and abstracts retrieved by searches against the inclusion and exclusion criteria and examined full study texts that potentially met the criteria but whose abstracts lacked sufficient information. Rejected studies were recorded with reasoning. A third author (F.M.A.) resolved and recorded any study selection disagreements. A PRISMA flowchart gives search counts for inclusions and exclusions and reasons for study exclusions (Figure 1).[26]

Table 1 Eligibility criteria for study selection

Variable	Inclusion	Exclusion
Patients	Adults ≥ 18 years, any sex, ethnicity, settings or countries Any inflammatory and noninflammatory dermatological conditions	Persons under the age of 18 years
Methods	Interventional RCTs published as full papers in peer reviewed journals (including crossover trials and trials with open-label extensions if initial treatment was continued after study completion) Published between 1 January 1994 and 17 November 2021 Interventions included any drug, therapeutic intervention and alternative medicines, e.g. acupuncture, fire needle, Chinese traditional (herbal) medicine, Ayurvedic and educational or lifestyle interventions	Not in the English language 'Grey' literature including dissertations, conference abstracts, reports, editorials, letters to editors, commentaries, protocols, reviews, conference proceedings and dissertations
Outcomes	DLQI is primary outcome	No DLQI data given

DLQI, Dermatology Life Quality Index; RCT, randomized controlled trial.

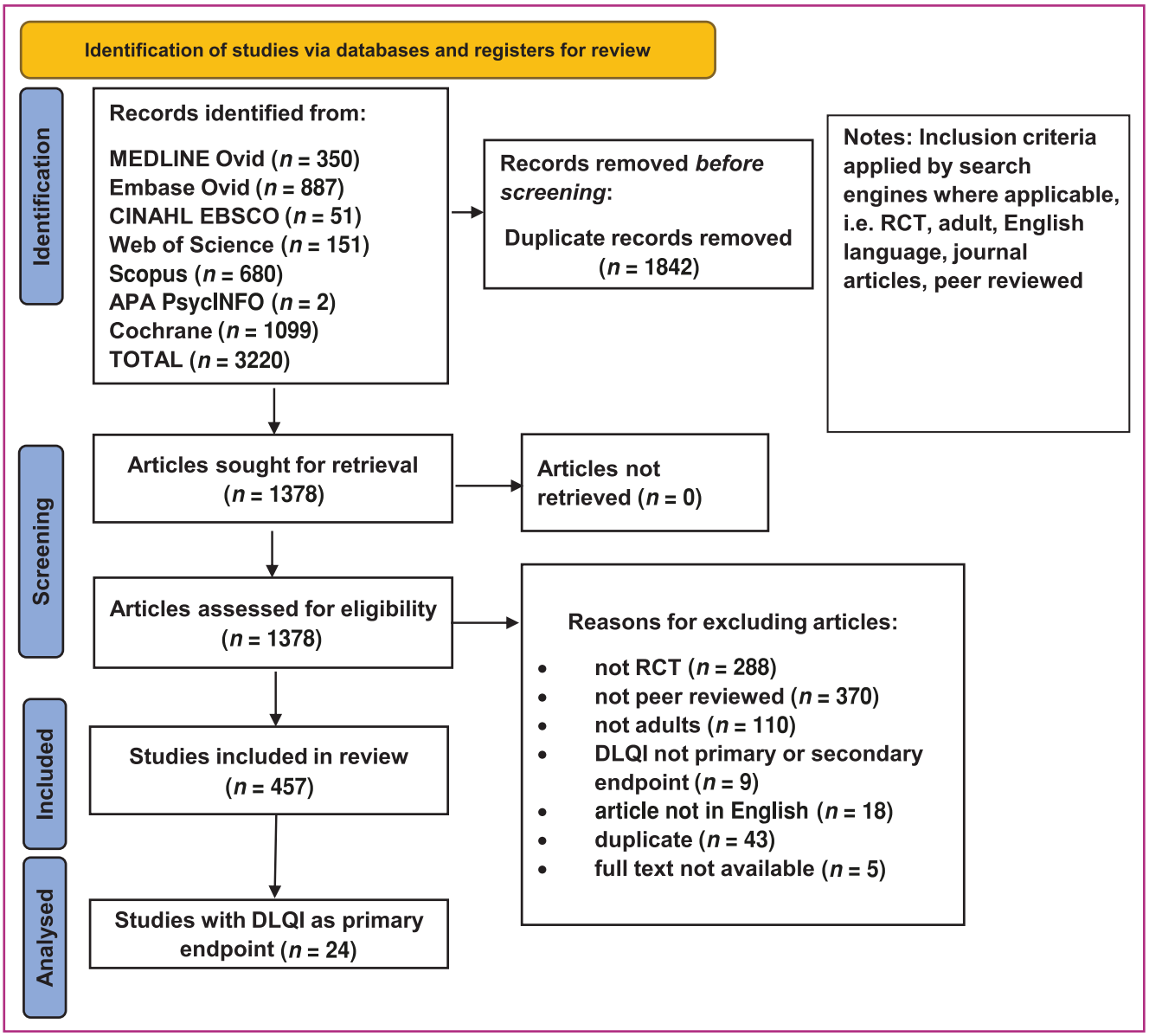

Figure 1 PRISMA 2020 flow diagram.APA, American Psychological Association; DLQI, Dermatology Life Quality Index; RCT, randomized controlled trial.

Studies not including new DLQI data, and previously published analyses, were excluded, as were publications with no DLQI data (even though use of the DLQI was mentioned).

Outcome measures extracted

Information recorded included the study aim, disease studied, country or countries where the study was conducted, the total number of participants enrolled in the study, systemic/topical drugs or other (nonpharmacological) interventions, and evidence for the DLQI as primary outcome.

If studies did not report primary data but extracted data from previously published RCTs and performed post hoc style analysis, data were obtained from the original published RCTs, particularly in relation to methodology and study design. Sometimes these elements and DLQI score data were supplied in supplementary data files that were also consulted and extracted. Drug registrations, e.g. National Institutes of Health, US National Library of Medicine and ClinicalTrials.gov, were consulted and data were extracted relating to study protocols, particularly on the location of studies, if these data were not provided in the articles.

Data extraction and synthesis

For data extraction, guidance from the Cochrane Handbook for Systematic Reviews of Interventions was followed.[30] A REDCap database[31–33] (a secure web application for building/managing online surveys and databases) was created based on the Cochrane Handbook version 6.2[34] and the updated guidance recommendations.[30] J.R.J and J.V. independently extracted data from the included publications to parallel REDCap database tables, and an adjudicator (F.M.A.) resolved any disagreements in data extraction. Missing data were noted in the data templates, but none were sufficiently important to contact original authors.

The two reviewers independently assessed the risk of bias (quality) of included studies using the Jadad scale.[35,36] Each assessment of bias focused on a specific aspect of trial design, conduct and reporting of the RCT rather than at a study or outcome level. The following domains were included in the bias analysis: bias arising from the randomization process; bias owing to blinding; and bias as a result of not accounting for all patients. Jadad scores ≥ 3 indicate studies of good quality.[37]

Primary outcome determination

The term 'outcome' usually refers to a measured variable [e.g. Psoriasis Area and Severity Index (PASI)], whereas an endpoint refers to the analysed parameter (e.g. change from baseline at 12 weeks in mean PASI). A 'primary endpoint' refers to the main result that is measured at the end of a clinical trial to determine whether a given treatment has worked (e.g. the difference in survival between a treatment group and a control group) and should be predefined in the registered protocol.

The following criteria were used to determine whether the DLQI was a primary outcome:

- If it was stated that the DLQI score was a primary outcome in the publication
- If the RCT had been registered (e.g. ClinicalTrials.gov with a National Clinical Trial number) and the DLQI was listed as a primary outcome
- If no other primary outcome was stated, and the DLQI was not stated as the secondary outcome, then we examined:

  Sample size calculation and study power: if the outcome measure used to calculate the sample size and the study power (i.e. the probability of type 2 error) was the DLQI, then the DLQI was considered to be the primary outcome

  Study objective: if the DLQI was clearly used to fulfil the study objective (i.e. QoL outcome) or equally so with another outcome measure, the DLQI was considered a primary outcome

  Priority or order of measures described: if the DLQI was first, or equally described with another outcome measure, the DLQI was considered a primary outcome

  The conclusion: if the conclusion was based on another outcome measure, not the DLQI, the DLQI was not a primary outcome (unless other supporting evidence was presented).

In an experimental, quasiexperimental or analytic observational research study, the primary study outcomes arise from and align directly with the primary study aim or objective.[38] Primary outcomes are the basis for determining whether the study met its objective or, in the case of interventional clinical trials, will be the main data evaluated for regulatory approval (https://toolkit.ncats.nih.gov/glossary/endpoint/). Furthermore, a primary outcome should generally not be a measure of something that is not important to the patient.

The US Food and Drug Administration (FDA) have produced guidelines on the use of primary endpoints and outcomes, stating 'The set of primary endpoints consists of the outcome or outcomes (based on the drug's expected effects) that establish the effectiveness, and/or safety features, of the drug in order to support regulatory action.'[39]

Results

Of the 3220 publications retrieved from the online databases, 457 articles met the eligibility criteria and included 198 587 patients. The DLQI scores were primary outcomes in 24 studies (5.3%) during the period from 2004 to 2021 (Figure 2) and these studies examined 15 different diseases and included 3436 patients (Figure 1). Seventeen of the 24 studies (70.8%) also used another PRO/QoL instrument as a primary or secondary outcome.

Most of the 24 included studies were good quality, with Jadad risk of bias scale showing that bias was uncertain or low (87.5% of studies had Jadad scores of ≥ 3; good quality) (Figure 3).[37]

Most study interventions (17 of 24, 68%) involved systemic drugs; five of 25 pharmacological interventions (20%) involved biologics (liraglutide, alefacept, secukinumab, ustekinumab, adalimumab). Eight studies (32%) involved topical treatments and eight studies (24% of the total

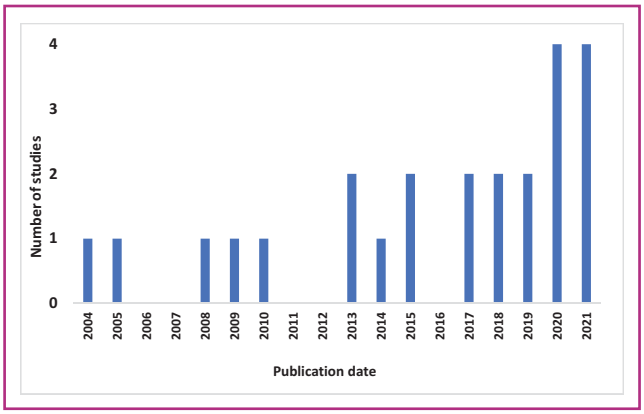

Figure 2 Distribution of published articles by date.

interventions) were of nonpharmacological interventions. Three studies used nontraditional medicines. Eight studies (33%) were multicentred. Twenty-three studies included both male and female patients, with one study including female patients only. Only seven studies (29%) mentioned the ethnicity of the study group.

The total dataset is summarized in Table 2.[40–63]

Discussion

This systematic review has reported the use of the DLQI as a primary outcome in RCTs and is the first reported review of PROs being used as primary outcomes in dermatology.

By 2004 many trials in rheumatology and gastrointestinal diseases used a PRO as part of defining primary or secondary outcomes, with PROs being reported in 64 (30%) of the 215 product labels reviewed.[1] A trial in advanced pancreatic cancer was conducted with a primary endpoint of time to deterioration (TTD) based primarily on PROs of pain intensity and analgesic use.[64] The study demonstrated that a primarily PRO-based endpoint of TTD was both feasible and relevant for patients with pancreatic cancer.

A systematic meta-research analysis of primary endpoints in clinical trials of palliative radiotherapy[2] was conducted for 292 eligible published studies. Only 64.4% (145 of 225) of these published trials clearly stated their endpoint, but a 'patient-centred primary endpoint' (e.g. PRO) was seen in 45.5% (66 of 145) of the studies and a 'tumour-centred primary endpoint' was reported in 17.3% (25 of 145). Registered ongoing trials used a 'patient-centred primary endpoint' in 32.8% (22 of 67) of the studies and a 'tumour-centred primary endpoint' in 26.9% (18 of 67). In trials on bone metastasis, the 'patient-centred primary endpoint' (overall 21 of 29 studies, 72.4%) was mainly a PRO (20 of 29, 69%). The meta-research analysis showed that the rate of PRO primary endpoints in published palliative radiotherapy trials compared favourably with other oncology trials.

PROs have had an increasing role in oncology care.[65,66] A recent 2022 study of collection and reporting of PRO data in interventional cancer trials conducted at a single centre found that 10 of 26 studies had PROs rather than clinical primary outcomes.[67] These data reflect the importance of the patient perspective in cancer care.

In a review of PROs as endpoints in clinical trials of kidney transplantation interventions,[68] a PRO was the primary outcome for assessment of disease-specific symptoms exclusively in 4 of 13 approvals (31%), and a secondary outcome in 8 of 13 approvals (62%) with a PRO claim.[69]

For a PRO to be used as a primary outcome in clinical studies, it is important for it to show sufficient responsiveness, such that small treatment effects can be observed (as symptoms often improve before QoL does). Two of the 24 included studies reported effect sizes. Farahani *et al.*[45] reported medium effect sizes using the DLQI in favour of *Sambucus ebulus* vs. hydrocortisone treatment for interaction of drug groups and time using the generalized estimation equation. The mean DLQI score in the *S. ebulus* group significantly changed from 6.72 (SD 5.72) to 3.16 (SD 3.97) after 4 weeks of medication. The DLQI score in the hydrocortisone group significantly changed from 5.11 (SD 4.88) to 3.37 (SD 4.56) with a significantly better improvement in the *S. ebulus* group ($P=0.029$, $\eta^2=0.061$). Yang *et al.*[62] calculated the optimum number of participants for each arm based on an effect size of 0.57 (changes in DLQI scores from baseline to day 56) with an error of 0.0125 (corrected for four comparisons) and β error of 0.8 in a 1 : 1 treatment–control design.

In a recent systematic review,[70] we reported data on 12 studies specifically conducted with statistical analysis using anchors performed to assess the responsiveness to change

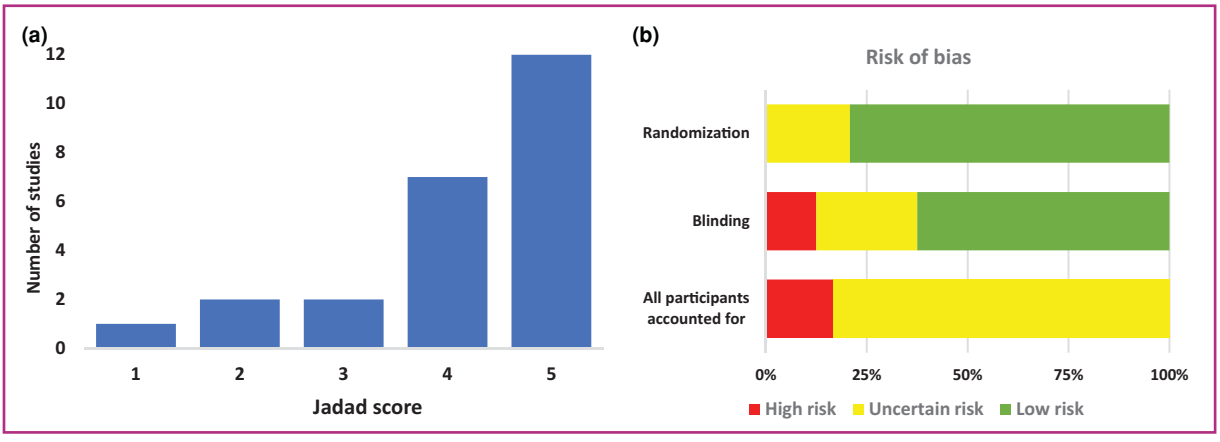

Figure 3 Distribution of Jadad scores and risk of bias.

Table 2 Data extracted from studies in which DLQI is a primary outcome

Author, year	Disease	Country	Participants	Systemic	Topical	Non-pharmacological	Evidence for primary outcome	Random	Blind	Fate	Jadad score total
Ali, 2017[40]	Any skin disease	UK	104			Paper-based DLQI, iPad tablet DLQI, crossover after 30 min	DLQI only	2	2	1	5
Campanati, 2020[41]	Palmar hyperhidrosis	Greece	70	Botulinum toxin type a (btx-a) + oral oxybutynin chloride for relapse only, oral oxybutynin chloride monotherapy			Hyperhidrosis Disease Severity Scale (HDSS) and DLQI: Effectiveness was evaluated through the HDSS, and the DLQI score. Conclusion based on HDSS	1	0	0	1
Campos, 2019[42]	Rosacea	Spain	54			595 nm pulsed-dye laser (PDL), sequential emission of laser and 1064 nm Nd:YAG	Objective: to compare treatment efficacy of purpuragenic PDL with laser. Efficacy was evaluated by spectrophotometric measurement, visual photograph evaluation, DLQI, and a post-treatment questionnaire. DLQI results presented first	2	2	1	5
Dorgham, 2021[43]	Hirsutism	Egypt	150	Metformin, combined oral contraceptive (diane-35)		Laser hair removal (LHR), LHR + metformin, LHR + combined oral contraceptive (diane-35)	Patients' quality of life (QoL) was assessed using a visual analogue scale (VAS) and DLQI and a customized questionnaire [Hirsutism Life Quality Index (HLQI)]. All patients showed significant improvement in DLQI and HLQI after treatment	2	0	0	2
Escuadro-Chin, 2019[44]	Xerosis	Philippines	148		Mineral oil, virgin coconut oil		Primary outcomes were measured at baseline and 2-weeks post-treatment included DLQI	2	2	1	5
Farahani, 2021[45]	Eczema/hand eczema	Iran	94		Hydrocortisone, *Sambucus ebulus* cream		Primary outcomes were changes in the severity of hand eczema (Hand Eczema Severity Index) and life quality (DLQI)	2	2	1	5
Faurschou, 2015[46]	Psoriasis	Denmark	16	Placebo, liraglutide			The primary endpoints were improvement in Psoriasis Area and Severity Index (PASI) and DLQI (NCT01460069)	2	2	1	5
Feldman, 2004[47]	Psoriasis	Multiple	549	Placebo/ alefacept, alefacept/ placebo, alefacept/ alefacept			To evaluate the effect of alefacept on QoL. The DLQI, selected as the primary QoL scale, and the DLQI, dermatology QoL scales and SF-36 were administered	2	2	1	5

(*Continued*)

Table 2 (*Continued*)

Author, year	Disease	Country	Participants	Systemic	Topical	Non-pharmacological	Evidence for primary outcome	Random	Blind	Fate	Jadad score total
Foroutan, 2017[48]	Pruritus	Iran	90	Doxepin, pregabalin			Objective: to compare antipruritic effects. Severity of pruritus and effect on QoL assessed by VAS, 5-D itch scale and DLQI. Pregabalin significantly reduced mean scores of the 5-D itch scale and the DLQI compared with doxepin. PASI used to calculate sample size	2	1	1	4
Franken, 2013[49]	Polymorphic light eruption	the Netherlands	29			Home ultraviolet (UV)B, hospital UVB	Objective: to compare effectiveness of the irradiation. Outcome assessment based on DLQI questionnaire	2	1	1	4
Gerdes, 2020[50]	Psoriasis	Multiple countries	–	Placebo, secukinumab, ustekinumab			Objective: to assess patient-reported outcomes (Patient's Global Assessment, DLQI, SF-36, Beck Depression Inventory, EuroQol-FT). For the main analysis, we focused on QoL (DLQI) and disease severity (PASI) at week 16. NCT02074982 and NCT01406938 gave PASI as primary endpoint and DLQI as secondary endpoint	2	2	1	5
Grant, 2010[51]	Hirsutism in polycystic ovary syndrome	UK	42	Camomile tea, spearmint tea			Primary efficacy endpoint regarded clinical reductions in the degree of hirsutism as scored by the modified DLQI and Ferriman–Gallwey score	2	2	1	5
Grimstad, 2020[52]	Hidradenitis suppurativa	Norway	20	Placebo × 1, botulinum toxin (btx-b) × 1, botulinum (btx-b) 2			The primary outcome was QoL, measured using the DLQI	2	2	1	5
Grob, 2008[53]	Urticaria	France	142	Placebo, desloratadine			Main outcome measures: the French translation version of the DLQI and the VQ-Dermato	2	2	1	5
Grob, 2009[54]	Urticaria	France	60	Placebo/ desloratidine, desloratidine/ placebo			Main outcome measure was QoL assessed by the VQ-Dermato and DLQI. The primary efficacy parameters were changes in VQ-Dermato and DLQI scores at visits 2 to 4	1	2	1	4
Haber, 2020[55]	Uremic pruritus	Lebanon	16	Doxepine, gabapentin, crossover			DLQI primary outcome measure (NCT03758079)	1	1	1	3

(*Continued*)

Table 2 (*Continued*)

Author, year	Disease	Country	Participants	Systemic	Topical	Non-pharmacological	Evidence for primary outcome	Random	Blind	Fate	Jadad score total
Huang, 2013[56]	Chronic actinic dermatitis and polymorphous light eruption	China	–		Cetirizine dihydrochloride + mometasone furoate cream	Standard treatment: cetirizine dihydrochloride + mometasone furoate cream, standard treatment + education	Objective: effect of formal sun protection education on sun-exposure habits and QoL	2	0	0	2
Lambert, 2021[57]	Psoriasis	Multiple	928	Brodalumab, ustekinumab			Objective: to compare the effects of 52 weeks of treatment with brodalumab or ustekinumab on health-related QoL (HRQoL). HRQoL outcomes were measured using the DLQI (only)	2	2	1	5
Martin, 2021[58]	Atopic dermatitis	Brazil	16		Cream without propolis (placebo), cream containing green propolis extract		DLQI used for sample size calculation. Objective: to develop a cold cream formulation based on purified beeswax. SCORing Atopic Dermatitis to measure severity, DLQI for QoL. No obvious primary outcome measure	1	2	1	4
Salisbury, 2005[59]	Any skin disease	UK	556			General practitioner with special interest group, hospital outpatient group	Primary outcomes were disease-related QoL (DLQI) and improvement in patients' perception of access to services	2	1	1	4
Sarafian, 2015[60]	Psoriasis	Iran	80		Placebo, turmeric microemulgel		DLQI and PASI score in addition to photographs before and after treatment were used to evaluate the outcomes	2	2	0	4
Schmitt, 2014[61]	Psoriasis	Germany	47			Dermatological care, interdisciplinary care	Primary endpoint was the mean change in DLQI at 6 months	2	1	1	4
Yang, 2018[62]	Urticaria	Taiwan	74	Placebo + levocetirizine, Chinese herbal medicine xiao-feng-san (xfs) and qing-shang-fang-feng-tang (qsfft)			Objective: to evaluate the effectiveness and safety of the mixture of two Chinese herbal medicine formula for urticaria. The symptom severity of urticaria was designed as the primary outcome using Urticaria Activity Score 7 and DLQI	2	2	1	5
Zouboulis, 2018[63]	Hidradenitis suppurativa	Multiple	151	Adalimumab			Objectives: to evaluate the role of pruritus (itch) in mediating the relationship between improvements in disease severity and HRQoL (PASI and DLQI)	1	1	1	3

of the DLQI. Cohen's *d* effect sizes were reported between 0.3 and 0.82 [effects were considered small (0.2), medium (0.5), large (0.8) or very large (1.3)]. Effect sizes were also determined using Pearson's/Spearman's correlations and with other measures ranged from −0.35 to 0.75 [with correlation of ±0.2 (small), ±0.5 (medium) and ±0.8 (large)].[71] Significant responsiveness using ANOVA and Wilcoxon two-sample (paired) analysis was also demonstrated.

Shikiar *et al*.[72] further demonstrated that the DLQI was more responsive to changes in endpoints than 36-Item Short Form Health Survey or EuroQol-5D in the assessment of patients with psoriasis. In addition, there is well-accepted banding to aid in determining changes in DLQI scores[73] and the clinical meaning/interpretation (minimal clinically important difference) of the DLQI has been well validated and established in the literature,[74,75] and these are widely used.

There has been an increasing trend recently towards the use of the DLQI as a primary outcome for a wide variety of dermatological diseases. This has paralleled the promotion by the FDA of PROs for drug registration, and their increasing use by clinicians – from bench to practice.[76] Most of the studies were of good quality, with the Jadad risk of bias scale showing that bias was uncertain or low, and 87.5% of studies had total Jadad scores of ≥3. A limitation of this systematic review is that only English language articles were reviewed. Additionally, although we were able to clearly identify studies using objective criteria where the DLQI was the primary outcome, there was no mention by authors of the rationale of selecting a PRO as the primary endpoint, or the effect on the focus of the RCT. Previous studies have reported significantly less missing data collected from PROs vs. clinical outcomes because of the patient focus of the measures.[67] As the DLQI was developed for use with adults and only validated for this age group, this study excluded publications that included children as study participants. Because of the differing requirements of studying adults and children, the Children's DLQI instrument[77] has been separately developed and validated and is a completely different instrument with different construction. Thus, combining of scores of the DLQI and Children's DLQI is not feasible. For studies aiming to include both adults and children, it would not be appropriate to use QoL measures as the primary outcome owing to the need for different QoL instruments for different ages and the inability to combine scores for adults and children. From the standpoint of good practice advice, we recommend that data on ethnicity should be recorded in all future trials involving patients.

The systematic review on which this study was based identified use of the DLQI in 454 RCTs encompassing 69 diseases and 42 countries.[4] The DLQI is incorporated into guidelines or registries in at least 45 countries.[3] It has a long history of use by clinicians and researchers as a tool to understand the burden of skin diseases on patients and to assess the effectiveness of interventions, and a large body of validation studies,[70] positioning the DLQI as an appropriate primary outcome measure in dermatological clinical trials. It also has broad accessibility (the DLQI has been translated into >137 languages)[78] and is simple and easy to use.[25]

This study provides evidence of the use of DLQI as a primary outcome in clinical trials. Researchers and clinicians can use this data to inform decisions about further use of the DLQI as a primary outcome.

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Conflicts of interest

A.Y.F. is joint copyright owner of the Dermatology Life Quality Index (DLQI). Cardiff University receives royalties from some use of the DLQI: A.Y.F. receives a proportion of these under standard university policy. J.R.I. receives a stipend as Editor-in-Chief of the *British Journal of Dermatology* and an authorship honorarium from *UpToDate*. He is a consultant for AbbVie, Boehringer Ingelheim, ChemoCentryx, MoonLake, Novartis, UCB Pharma and Union Therapeutics, and has served on advisory boards for Insmed, Kymera Therapeutics and Viela Bio. He is co-copyright holder of Hidradenitis Suppurativa Quality of Life, Investigator's Global Assessment and Patient's Global Assessment instruments for hidradenitis suppurativa. His department receives income from royalties from the Dermatology Life Quality Index (DLQI) and related instruments. S.S. has received an unrestricted educational grant from GSK and the Centre for Innovative Regulatory Science, is a consultant for Novo Nordisk and produces educational materials for AbbVie. J.V. participated in an Advisory Board for Amgen, has received payment or honoraria from L'Oreal and support from UCB pharma for attending meetings. F.M.A. has received honoraria from AbbVie, Janssen, LEO Pharmaceuticals, Lilly Pharmaceuticals, L'Oreal, Novartis and UCB. His department receives income from royalties from the DLQI and related instruments. J.R.J. has no conflicts of interest to report. His department receives income from royalties from the DLQI and related instruments.

Data availability

All data are incorporated into the article and its online supplementary material.

Ethics statement

Not applicable.

Patient consent statement

Not applicable.

References

1 Willke RJ, Burke LB, Erickson P. Measuring treatment impact: a review of patient-reported outcomes and other efficacy endpoints in approved product labels. *Control Clin Trials* 2004; **25**:535–52.

2 Fabian A, Domschikowski J, Letsch A *et al.* Clinical endpoints in trials of palliative radiotherapy: a systematic meta-research analysis. *Radiother Oncol* 2022; **174**:123–31.
3 Finlay A, Singh R. DLQI guidelines, registries and reimbursement guidelines. Available at: https://www.cardiff.ac.uk/__data/assets/pdf_file/0008/1744793/DLQI-guidelines-worldwide-Jan-2020.pdf (last accessed 24 May 2024).
4 Vyas J, Johns JR, Ali FM *et al.* A systematic review of 454 randomised controlled trials using the Dermatology Life Quality Index: experience in 69 diseases and 43 countries. *Br J Dermatol* 2023; **190**:315–39.
5 Powers JH, 3rd, Howard K, Saretsky T *et al.* Patient-reported outcome assessments as endpoints in studies in infectious diseases. *Clin Infect Dis* 2016; **63** (Suppl. 2):S52–6.
6 Rivera SC, Kyte DG, Aiyegbusi OL *et al.* The impact of patient-reported outcome (PRO) data from clinical trials: a systematic review and critical analysis. *Health Qual Life Outcomes* 2019; **17**:156.
7 Weldring T, Smith SM. Patient-reported outcomes (PROs) and patient-reported outcome measures (PROMs). *Health Serv Insights* 2013; **6**:61–8.
8 Basch E, Barbera L, Kerrigan CL, Velikova G. Implementation of patient-reported outcomes in routine medical care. *Am Soc Clin Oncol Educ Book* 2018; **38**:122–34.
9 Cruz Rivera S, McMullan C, Jones L *et al.* The impact of patient-reported outcome data from clinical trials: perspectives from international stakeholders. *J Patient Rep Outcomes* 2020; **4**:51.
10 Gnanasakthy A, Lewis S, Clark M *et al.* Potential of patient-reported outcomes as nonprimary endpoints in clinical trials. *Health Qual Life Outcomes* 2013; **11**:83.
11 Fairclough DL. Patient reported outcomes as endpoints in medical research. *Stat Methods Med Res* 2004; **13**:115–38.
12 Ioannidis JP, Evans SJ, Gotzsche PC *et al.* Better reporting of harms in randomized trials: an extension of the CONSORT statement. *Ann Intern Med* 2004; **141**:781–8.
13 Calvert M, Blazeby J, Altman DG *et al.* Reporting of patient-reported outcomes in randomized trials: the CONSORT PRO extension. *JAMA* 2013; **309**:814–22.
14 Brundage M, Blazeby J, Revicki D *et al.* Patient-reported outcomes in randomized clinical trials: development of ISOQOL reporting standards. *Qual Life Res* 2013; **22**:1161–75.
15 Butcher NJ, Monsour A, Mew EJ *et al.* Guidelines for reporting outcomes in trial reports: the CONSORT-Outcomes 2022 extension. *JAMA* 2022; **328**:2252–64.
16 Calvert M, King M, Mercieca-Bebber R *et al.* SPIRIT-PRO Extension explanation and elaboration: guidelines for inclusion of patient-reported outcomes in protocols of clinical trials. *BMJ Open* 2021; **11**:e045105.
17 Snyder C, Gilbert A, Moher D *et al.* Recommendations for including or reviewing patient reported outcome endpoints in grant applications. *BMJ* 2021; **373**:n1367.
18 Bansal D, Bhagat A, Schifano F, Gudala K. Role of patient-reported outcomes and other efficacy endpoints in the drug approval process in Europe (2008–2012). *J Epidemiol Glob Health* 2015; **5**:385–95.
19 Calvert M, Kyte D, Mercieca-Bebber R *et al.* Guidelines for inclusion of patient-reported outcomes in clinical trial protocols: the SPIRIT-PRO Extension. *JAMA* 2018; **319**:483–94.
20 Croog SH, Levine S, Testa MA *et al.* The effects of antihypertensive therapy on the quality of life. *N Engl J Med* 1986; **314**:1657–64.
21 Bishop J. Squibb drug called superior in easing high blood pressure: findings of medical journal are leaked, prompting a jump in price of stock. *Wall Street Journal* 1986; 25.
22 Wilson MK, Karakasis K, Oza AM. Outcomes and endpoints in trials of cancer treatment: the past, present, and future. *Lancet Oncol* 2015; **16**:e32-42.
23 Fiteni F, Ray IL, Ousmen A *et al.* Health-related quality of life as an endpoint in oncology phase I trials: a systematic review. *BMC Cancer* 2019; **19**:361.
24 Bruner DW, Movsas B, Basch E. Capturing the patient perspective: patient-reported outcomes as clinical trial endpoints. *Am Soc Clin Oncol Educ Book* 2012; 2012:139–44.
25 Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. *Clin Exp Dermatol* 1994; **19**:210–16.
26 Page MJ, McKenzie JE, Bossuyt PM *et al.* The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *IHRev Esp Cardiol (Engl Ed)* 2021; **74**:790–9.
27 Johns J, Finlay AY, Ali FM *et al.* A systematic review of treatment/intervention evaluation in dermatological conditions using the Dermatology Life Quality Index (DLQI). Available at: https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=290587 (last accessed 24 May 2024).
28 Schiavo JH. PROSPERO: an international register of systematic review protocols. *Med Ref Serv Q* 2019; **38**:171–80.
29 Peters MDJ. Managing and coding references for systematic reviews and scoping reviews in EndNote. *Med Ref Serv Q* 2017; **36**:19–31.
30 Higgins JPT, Thomas J, Chandler J *et al. Cochrane Handbook for Systematic Reviews of Interventions*, version 6.3 (updated February 2022). Available at: http://www.training.cochrane.org/handbook (last accessed 24 May 2024).
31 Harris PA, Taylor R, Thielke R *et al.* Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009; **42**:377–81.
32 Van Bulck L, Wampers M, Moons P. Research Electronic Data Capture (REDCap): tackling data collection, management, storage, and privacy challenges. *Eur J Cardiovasc Nurs* 2022; **21**:85–91.
33 Harris PA, Taylor R, Minor BL *et al.* The REDCap consortium: building an international community of software platform partners. *J Biomed Inform* 2019; **95**:103208.
34 Higgins JP, Green S. *Cochrane Handbook for Systematic Reviews of Interventions*, version 5.1.0. Available at: https://crtha.iums.ac.ir/files/crtha/files/cochrane.pdf (last accessed 24 May 2024).
35 Stephen HH, Douglas MJ. Appendix: Jadad scale for reporting randomized controlled trials. In: *Evidence-based Obstetric Anesthesia* (Halpern SH, Douglas MJ, eds). Oxford: Blackwell Publishing Ltd, 2005.
36 Jadad AR, Moore RA, Carroll D *et al.* Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Control Clin Trials* 1996; **17**:1–12.
37 Hartling L, Bond K, Vandermeer B *et al.* Applying the risk of bias tool in a systematic review of combination long-acting beta-agonists and inhaled corticosteroids for persistent asthma. *PLOS ONE* 2011; **6**:e17242.
38 Vetter TR, Mascha EJ. Defining the primary outcomes and justifying secondary outcomes of a study: usually, the fewer, the better. *Anesth Analg* 2017; **125**:678–81.
39 US Food and Drug Administration. *Multiple Endpoints in Clinical Trials Guidance for Industry*. Silver Spring, MD: US Food and Drug Administration, 2022.
40 Ali FM, Johns N, Salek S *et al.* Validation of the electronic version of the Dermatology Life Quality Index (DLQI). *J Invest Dermatol* 2017; **137** (Suppl. 2): S200.
41 Campanati A, Consales V, Rizzetto G *et al.* Combined treatment of palmar hyperhidrosis with botulinum toxin type A and oxybutynin chloride: results of a clinical, multicenter, prospective study. *Dermatol Ther* 2020; **33**:e14039.
42 Campos MA, Sousa AC, Varela P *et al.* Comparative effectiveness of purpuragenic 595 nm pulsed dye laser versus sequential emission of 595 nm pulsed dye laser and 1,064 nm Nd:YAG laser: a double-blind randomized controlled study. *Acta Dermatovenerol Alp Pannonica Adriat* 2019; **28**:1–5.
43 Dorgham N, Sharobim A, Haggag H *et al.* Adding combined oral contraceptives or metformin to laser treatment in polycystic ovarian syndrome hirsute patients. *J Drugs Dermatol* 2021; **20**:302–6.

44 Escuadro-Chin MO, Maanõ MMC, Dofitas BL. Randomized assessor-blinded controlled trial on the efficacy and safety of virgin coconut oil versus mineral oil as a therapeutic moisturizer for senile xerosis. *Acta Med. Philippina* 2019; **53**:335–43.
45 Farahani AM, Aryanian Z, Memariani Z *et al.* A comparison of the effect of topical preparation of *Sambucus ebulus* L. and hydrocortisone on hand eczema: a double-blind randomized controlled trial. *J Altern Complement Med* 2021; **27**:323–30.
46 Faurschou A, Gyldenlove M, Rohde U *et al.* Lack of effect of the glucagon-like peptide-1 receptor agonist liraglutide on psoriasis in glucose-tolerant patients—a randomized placebo-controlled trial. *J Eur Acad Dermatol Venereol* 2015; **29**:555–9.
47 Feldman SR, Menter A, Koo JY. Improved health-related quality of life following a randomized controlled trial of alefacept treatment in patients with chronic plaque psoriasis. *Br J Dermatol* 2004; **150**:317–26.
48 Foroutan N, Etminan A, Nikvarz N, Shojai Shahrokh Abadi M *et al.* Comparison of pregabalin with doxepin in the management of uremic pruritus: a randomized single blind clinical trial. *Hemodial Int* 2017; **21**:63–71.
49 Franken SM, Genders RE, de Gruijl FR *et al.* Skin hardening effect in patients with polymorphic light eruption: comparison of UVB hardening in hospital with a novel home UV-hardening device. *J Eur Acad Dermatol Venereol* 2013; **27**:67–72.
50 Gerdes S, Korber A, Biermann M *et al.* Absolute and relative psoriasis area and severity index (PASI) treatment goals and their association with health-related quality of life. *J Dermatolog Treat* 2020; **31**:470–5.
51 Grant P. Spearmint herbal tea has significant anti-androgen effects in polycystic ovarian syndrome. A randomized controlled trial. *Phytother Res* 2010; **24**:186–8.
52 Grimstad Ø, Kvammen BØ, Swartling C. Botulinum toxin type B for hidradenitis suppurativa: a randomised, double-blind, placebo-controlled pilot study. *Am J Clin Dermatol* 2020; **21**:741–8.
53 Grob JJ, Auquier P, Dreyfus I, Ortonne JP. Quality of life in adults with chronic idiopathic urticaria receiving desloratadine: a randomized, double-blind, multicentre, placebo-controlled study. *J Eur Acad Dermatol Venereol* 2008; **22**:87–93.
54 Grob JJ, Auquier P, Dreyfus I, Ortonne JP. How to prescribe antihistamines for chronic idiopathic urticaria: desloratadine daily vs PRN and quality of life. *Allergy* 2009; **64**:605–12.
55 Haber R, Bachour J, Salloum A *et al.* Comparison of gabapentin and doxepin in the management of uremic pruritus: a randomized crossover clinical trial. *Dermatol Ther* 2020; **33**:e14522.
56 Huang C, Yan S, Ren J *et al.* A quantitative assessment of the effects of formal sun protection education on photosensitive patients. *Photodermatol Photoimmunol Photomed* 2013; **29**:261–5.
57 Lambert J, Hansen JB, Sohrt A, Puig L. Dermatology Life Quality Index in patients with moderate-to-severe plaque psoriasis treated with brodalumab or ustekinumab. *Dermatol Ther (Heidelb)* 2021; **11**:1265–75.
58 Martin BA, Lemos CN, Dalmolin LF *et al.* A new approach to atopic dermatitis control with low-concentration propolis-loaded cold cream. *Pharmaceutics* 2021; **13**:1346.
59 Salisbury C, Noble A, Horrocks S *et al.* Evaluation of a general practitioner with special interest service for dermatology: randomised controlled trial. *BMJ* 2005; **331**:1441–6.
60 Sarafian G, Raoufinejad K, Rajabi M *et al.* Topical turmeric microemulgel in the management of plaque psoriasis; a clinical evaluation. *Iran J Pharm Res* 2015; **14**:865–76.
61 Schmitt J, Wozel G, Garzarolli M *et al.* Effectiveness of interdisciplinary vs. dermatological care of moderate-to-severe psoriasis: a pragmatic randomised controlled trial. *Acta Derm Venereol* 2014; **94**:192–7.
62 Yang S-H, Lin Y-H, Chen H-Y *et al.* The efficacy and safety of a fixed combination of Chinese herbal medicine in chronic urticaria: a randomized, double-blind, placebo-controlled pilot study. *Front Pharmacol* 2018; **9**:1474.
63 Zouboulis CC, Okun MM, Prens EP *et al.* Long-term adalimumab efficacy in patients with moderate-to-severe hidradenitis suppurativa/acne inversa: 3-year results of a phase 3 open-label extension study. *J Am Acad Dermatol* 2018; **80**:60–9.e2.
64 Eckhardt SG, De Porre P, Smith D *et al.* Patient-reported outcomes as a component of the primary endpoint in a double-blind, placebo-controlled trial in advanced pancreatic cancer. *J Pain Symptom Manage* 2009; **37**:135–43.
65 Thaçi D, Soliman AM, Eyerich K *et al.* Patient-reported outcomes with risankizumab versus fumaric acid esters in systemic therapy-naïve patients with moderate to severe plaque psoriasis: a phase 3 clinical trial. *J Eur Acad Dermatol Venereol* 2021; **35**:1686–91.
66 Zagadailov E, Fine M, Shields A. Patient-reported outcomes are changing the landscape in oncology care: challenges and opportunities for payers. *Am Health Drug Benefits* 2013; **6**:264–74.
67 Lidington E, Hogan H, Gandolfi A *et al.* Assessing the collection and reporting of patient-reported outcome data in interventional cancer trials: a single institution, retrospective systematic evaluation. *J Patient Rep Outcomes* 2022; **6**:128.
68 Tong A, Oberbauer R, Bellini MI *et al.* Patient-reported outcomes as endpoints in clinical trials of kidney transplantation interventions. *Transpl Int* 2022; **35**:10134.
69 Jaroslawski S, Auquier P, Borissov B *et al.* Patient-reported outcome claims in European and United States orphan drug approvals. *J Mark Access Health Policy* 2018; **6**:1542920.
70 Vyas J, Johns J, Ali F *et al.* Validation of the Dermatology Life Quality Index (DLQI): a systematic review of the literature. *Br J Dermatol* 2024; **188** (Suppl. 4):P82.
71 Sullivan GM, Feinn R. Using effect size—or why the *P* value is not enough. *J Grad Med Educ* 2012; **4**:279–82.
72 Shikiar R, Willian MK, Okun MM *et al.* The validity and responsiveness of three quality of life measures in the assessment of psoriasis patients: results of a phase II study. *Health Qual Life Outcomes* 2006; **4**:71.
73 Hongbo Y, Thomas CL, Harrison MA *et al.* Translating the science of quality of life into practice: What do dermatology life quality index scores mean? *J Invest Dermatol* 2005; **125**:659–64.
74 Basra MK, Salek MS, Camilleri L *et al.* Determining the minimal clinically important difference and responsiveness of the Dermatology Life Quality Index (DLQI): further data. *Dermatology* 2015; **230**:27–33.
75 Ali FM, Salek MS, Finlay AY. Two minimal clinically important difference (2MCID): a new twist on an old concept. *Acta Derm Venereol* 2018; **98**:715–17.
76 US Food and Drug Administration. *Patient-Reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims*. Silver Spring, MD: US Food and Drug Administration, 2009.
77 Lewis-Jones MS, Finlay AY. The Children's Dermatology Life Quality Index (CDLQI): initial validation and practical use. *Br J Dermatol* 1995; **132**:942–9.
78 Cardiff University. Dermatology Life Quality Index. Available at: https://www.cardiff.ac.uk/medicine/resources/quality-of-life-questionnaires/dermatology-life-quality-index (last accessed 24 May 2024).

Consistent safety profile with over 8 years of real-world evidence, across licensed indications[1–3]

Cosentyx® secukinumab

1,000,000 patients treated globally, and counting across indications[4]

150+ clinical trials across indications[5]

8+ years of real-world evidence, worldwide across indications[1–3]

8 indications[1–3]

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Real-world evidence shows a consistent safety profile with long-term use of Cosentyx over 6 years[6,7]

No trend toward increased AE rates over time (pooled PsA, AS, PsO):*[6]

AEs of select interest (EAIR per 100 PY)	1 year	2 years	3 years	4 years	5 years	6 years	Cumulative rate
Serious infections Cases	2.0 n=149	1.7 n=475	0.7 n=649	1.3 n=1,841	1.3 n=2,285	1.1 n=2,226	1.3 n=8,719
Malignant or unspecified tumours Cases	0.2 n=15	0.2 n=50	0.2 n=225	0.3 n=422	0.3 n=520	0.3 n=573	0.3 n=1,896
MACE Cases	0.2 n=15	0.1 n=39	0.2 n=151	0.2 n=238	0.2 n=264	0.1 n=287	0.2 n=1,031
Total IBD Cases	0.2 n=12	0.2 n=46	0.2 n=185	0.3 n=340	0.2 n=312	0.1 n=261	0.2 n=1,291
Exposure (PY)	7450	28,549	93,744	137,325	182,024	212,636	680,470

No trend towards increased rates of malignancy, MACE or IBD over time[6]

The most frequently reported adverse reactions are upper respiratory tract infections (17.1%) (most frequently nasopharyngitis, rhinitis).[1,2] Refer to the prescribing information for a summary of adverse events.

Adapted from Novartis Data on File. 2021.[6]

Refer to the Cosentyx Summary of Product Characteristics for full details, dosing and administration, including special populations.

Cosentyx is indicated for the treatment of moderate to severe **PsO** in adults, children and adolescents from the age of 6 years who are candidates for systemic therapy; active **PsA** in adult patients (alone or in combination with methotrexate) when the response to previous disease-modifying anti-rheumatic drug therapy has been inadequate; active **AS** in adults who have responded inadequately to conventional therapy; active **nr-axSpA** with objective signs of inflammation as indicated by elevated C-reactive protein and/or magnetic resonance imaging evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active moderate to severe **HS** (acne inversa) in adults with an inadequate response to conventional systemic HS therapy; active **ERA** in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy; active **JPsA** in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy.[1,2]

Prescribing information, adverse event reporting and full indication can be found on the next page.

*Successive time periods of PSUR shown with cumulative rate: 26 Dec 2014 to 25 Dec 2015; 26 Dec 2015 to 25 Dec 2016; 26 Dec 2016 to 25 Dec 2017; 26 Dec 2017 to 25 Dec 2018: 26 Dec 2018 to 25 Dec 2019; 26 Dec 2019 to 25 Dec 2020.[6]

Abbreviations: AE, adverse event; AS, ankylosing spondylitis; EIAR, exposure-adjusted incidence rate; ERA, enthesitis-related arthritis; HCP, healthcare professional; HS, hidradenitis suppurativa; IBD, inflammatory bowel disease; JPsA, juvenile psoriatic arthritis; MACE, major adverse cardiac event; nr-axSpA, non-radiographic axial spondyloarthritis; PsA, psoriatic arthritis; PsO, plaque psoriasis; PY, patient year.

References: 1. Cosentyx® (secukinumab) GB Summary of Product Characteristics; **2.** Cosentyx® (secukinumab) NI Summary of Product Characteristics; **3.** European Medicines Agency. European public assessment report. Available at: https://www.ema.europa.eu/en/documents/overview/cosentyx-epar-medicine-overview_en.pdf [Accessed August 2024]; **4.** Novartis Data on File. Secukinumab – Sec008. 2023; **5.** ClinicalTrials.gov. Search results for 'secukinumab', completed, terminated and active, not recruiting trials. Available at: https://clinicaltrials.gov/search?term=Secukinumab,&aggFilters=status:com [Accessed August 2024]; **6.** Novartis data on file. Cosentyx Periodic Safety Update Report (PSUR); 26 December 2019 – 25 December 2020. 22 February 2021; **7.** Deodhar A, et al. Arthritis Res Ther 2019;21(1):111.

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Cosentyx® (secukinumab) Northern Ireland Prescribing Information.

Please refer to the Summary of Product Characteristics (SmPC) before prescribing.

Indications: Treatment of: moderate to severe plaque psoriasis in adults, children and adolescents from the age of 6 years who are candidates for systemic therapy; active psoriatic arthritis in adults (alone or in combination with methotrexate) who have responded inadequately to disease-modifying anti-rheumatic drug therapy; active ankylosing spondylitis in adults who have responded inadequately to conventional therapy; active non-radiographic axial spondyloarthritis (nr-axSpA) with objective signs of inflammation as indicated by elevated C-reactive protein (CRP) and/or magnetic resonance imaging (MRI) evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active enthesitis-related arthritis and juvenile psoriatic arthritis in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy; active moderate to severe hidradenitis suppurativa (acne inversa) in adults with an inadequate response to conventional systemic HS therapy. **Presentations:** Cosentyx 150 mg solution for injection in pre-filled pen; Cosentyx 300 mg solution for injection in pre-filled pen. **Dosage & Administration:** Administered by subcutaneous injection at weeks 0, 1, 2, 3 and 4, followed by monthly maintenance dosing. Consider discontinuation if no response after 16 weeks of treatment. Each 150 mg dose is given as one injection of 150 mg. Each 300 mg dose is given as two injections of 150 mg or one injection of 300 mg. If possible avoid areas of the skin showing psoriasis. *Plaque Psoriasis:* Adult recommended dose is 300 mg monthly. Based on clinical response, a maintenance dose of 300 mg every 2 weeks may provide additional benefit for patients with a body weight of 90 kg or higher. Adolescents and children from the age of 6 years: if weight ≥ 50 kg, recommended dose is 150 mg (may be increased to 300 mg as some patients may derive additional benefit from the higher dose). If weight < 50 kg, recommended dose is 75 mg. However, 150mg solution for injection in pre-filled pen is not indicated for administration of this dose and no suitable alternative formulation is available. *Psoriatic Arthritis:* For patients with concomitant moderate to severe plaque psoriasis see adult plaque psoriasis recommendation. For patients who are anti-TNFα inadequate responders, the recommended dose is 300 mg, 150 mg in other patients. Can be increased to 300 mg based on clinical response. *Ankylosing Spondylitis:* Recommended dose 150 mg. Can be increased to 300 mg based on clinical response. *nr-axSpA:* Recommended dose 150 mg. *Enthesitis-related arthritis and juvenile psoriatic arthritis:* From the age of 6 years, if weight ≥ 50 kg, recommended dose is 150 mg. If weight < 50 kg, recommended dose is 75 mg. However, 150mg solution for injection in pre-filled pen is not indicated for administration of this dose and no suitable alternative formulation is available. *Hidradenitis suppurativa:* Recommended dose is 300 mg monthly. Based on clinical response, the maintenance dose can be increased to 300 mg every 2 weeks. **Contraindications:** Hypersensitivity to the active substance or excipients. Clinically important, active infection. **Warnings & Precautions:** *Infections:* Potential to increase risk of infections; serious infections have been observed. Caution in patients with chronic infection or history of recurrent infection. Advise patients to seek medical advice if signs/symptoms of infection occur. Monitor patients with serious infection closely and do not administer Cosentyx until the infection resolves. Non-serious mucocutaneous candida infections were more frequently reported for secukinumab than placebo in the psoriasis clinical studies. Should not be given to patients with active tuberculosis (TB). Consider anti-tuberculosis therapy before starting Cosentyx in patients with latent TB. *Inflammatory bowel disease (including Crohn's disease and ulcerative colitis):* New cases or exacerbations of inflammatory bowel disease have been reported with secukinumab. Secukinumab, is not recommended in patients with inflammatory bowel disease. If a patient develops signs and symptoms of inflammatory bowel disease or experiences an exacerbation of pre-existing inflammatory bowel disease, secukinumab should be discontinued and appropriate medical management should be initiated. *Hypersensitivity reactions:* Rare cases of anaphylactic reactions have been observed. If an anaphylactic or serious allergic reactions occur, discontinue immediately and initiate appropriate therapy. *Vaccinations:* Do not give live vaccines concurrently with Cosentyx; inactivated or non-live vaccinations may be given. Paediatric patients should receive all age appropriate immunisations before treatment with Cosentyx. *Latex-Sensitive Individuals:* The removable needle cap of the 150mg pre-filled pen contains a derivative of natural rubber latex. *Concomitant immunosuppressive therapy:* Combination with immunosuppressants, including biologics, or phototherapy has not been evaluated in psoriasis studies. Cosentyx was given concomitantly with methotrexate, sulfasalazine and/or corticosteroids in arthritis studies. Caution when considering concomitant use of other immunosuppressants. **Interactions:** Live vaccines should not be given concurrently with secukinumab. No interaction between Cosentyx and midazolam (CYP3A4 substrate) seen in adult psoriasis study. No interaction between Cosentyx and methotrexate and/or corticosteroids seen in arthritis studies. **Fertility, pregnancy and lactation:** *Women of childbearing potential:* Use an effective method of contraception during and for at least 20 weeks after treatment. *Pregnancy:* Preferably avoid use of Cosentyx in pregnancy. *Breast feeding:* It is not known if secukinumab is excreted in human breast milk. A clinical decision should be made on continuation of breast feeding during Cosentyx treatment (and up to 20 weeks after discontinuation) based on benefit of breast feeding to the child and benefit of Cosentyx therapy to the woman. *Fertility:* Effect on human fertility not evaluated. **Adverse Reactions**: *Very Common* (≥1/10): Upper respiratory tract infection. *Common* (≥1/100 to <1/10): Oral herpes, headache, rhinorrhoea, diarrhoea, nausea, fatigue. *Uncommon (≥1/1,000 to <1/100):* Oral candidiasis, lower respiratory tract infections, neutropenia, inflammatory bowel disease. *Rare (≥1/10,000 to <1/1,000)*: anaphylactic reactions, exfoliative dermatitis (psoriasis patients), hypersensitivity vasculitis. *Not known:* Mucosal and cutaneous candidiasis (including oesophageal candidiasis). *Infections:* Most infections were non-serious and mild to moderate upper respiratory tract infections, e.g. nasopharyngitis, and did not necessitate treatment discontinuation. There was an increase in mucosal and cutaneous (including oesophageal) candidiasis, but cases were mild or moderate in severity, non-serious, responsive to standard treatment and did not necessitate treatment discontinuation. Serious infections occurred in a small proportion of patients (0.015 serious infections reported per patient year of follow up). *Neutropenia:* Neutropenia was more frequent with secukinumab than placebo, but most cases were mild, transient and reversible. Rare cases of neutropenia CTCAE Grade 4 were reported. *Hypersensitivity reactions:* Urticaria and rare cases of anaphylactic reactions were seen. *Immunogenicity*: Less than 1% of patients treated with Cosentyx developed antibodies to secukinumab up to 52 weeks of treatment. *Other Adverse Effects:* The list of adverse events is not exhaustive, please consult the SmPC for a detailed listing of all adverse events before prescribing. **Legal Category:** POM. **MA Number & List Price:** EU/1/14/980/005 - 150 mg pre-filled pen x2 £1,218.78; EU/1/14/980/010 – 300 mg pre-filled pen x 1 £1218.78. **PI Last Revised:** May 2023. Full prescribing information, (SmPC) is available from: Novartis Pharmaceuticals UK Limited, 2nd Floor, The WestWorks Building, White City Place, 195 Wood Lane, London, W12 7FQ. Telephone: (01276) 692255.

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Adverse Event Reporting:

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Novartis via uk.patientsafety@novartis.com or online through the pharmacovigilance intake (PVI) tool at www.novartis.com/report

If you have a question about the product, please contact Medical Information on 01276 698370 or by email at medinfo.uk@novartis.com

Cosentyx® (secukinumab) Great Britain Prescribing Information.

Please refer to the Summary of Product Characteristics (SmPC) before prescribing.

Indications: Treatment of: moderate to severe plaque psoriasis in adults, children and adolescents from the age of 6 years who are candidates for systemic therapy; active psoriatic arthritis in adults (alone or in combination with methotrexate) who have responded inadequately to disease-modifying anti-rheumatic drug therapy; active ankylosing spondylitis in adults who have responded inadequately to conventional therapy; active non-radiographic axial spondyloarthritis (nr-axSpA) with objective signs of inflammation as indicated by elevated C-reactive protein (CRP) and/or magnetic resonance imaging (MRI) evidence in adults who have responded inadequately to non-steroidal anti-inflammatory drugs; active enthesitis-related arthritis and juvenile psoriatic arthritis in patients 6 years and older (alone or in combination with methotrexate) whose disease has responded inadequately to, or who cannot tolerate, conventional therapy; active moderate to severe hidradenitis suppurativa (acne inversa) in adults with an inadequate response to conventional systemic HS therapy. **Presentations:** Cosentyx 75 mg solution for injection in pre-filled syringe; Cosentyx 150 mg solution for injection in pre-filled syringe; Cosentyx 150 mg solution for injection in pre-filled pen; Cosentyx 300 mg solution for injection in pre-filled pen. **Dosage & Administration:** Administered by subcutaneous injection at weeks 0, 1, 2, 3 and 4, followed by monthly maintenance dosing. Consider discontinuation if no response after 16 weeks of treatment. Each 75 mg dose is given as one injection of 75 mg. Each 150 mg dose is given as one injection of 150 mg. Each 300 mg dose is given as two injections of 150 mg or one injection of 300 mg. If possible avoid areas of the skin showing psoriasis. *Plaque Psoriasis:* Adult recommended dose is 300 mg. Based on clinical response, a maintenance dose of 300 mg every 2 weeks may provide additional benefit for patients with a body weight of 90 kg or higher. Adolescents and children from the age of 6 years: if weight ≥ 50 kg, recommended dose is 150 mg (may be increased to 300 mg as some patients may derive additional benefit from the higher dose). If weight < 50 kg, recommended dose is 75 mg. *Psoriatic Arthritis:* For patients with concomitant moderate to severe plaque psoriasis see adult plaque psoriasis recommendation. For patients who are anti-TNFα inadequate responders, the recommended dose is 300 mg, 150 mg in other patients. Can be increased to 300 mg based on clinical response. *Ankylosing Spondylitis:* Recommended dose 150 mg. Can be increased to 300 mg based on clinical response. *nr-axSpA:* Recommended dose 150 mg. *Enthesitis-related arthritis and juvenile psoriatic arthritis:* From the age of 6 years, if weight ≥ 50 kg, recommended dose is 150 mg. If weight < 50 kg, recommended dose is 75 mg. *Hidradenitis suppurativa:* Recommended dose is 300 mg monthly. Based on clinical response, the maintenance dose can be increased to 300 mg every 2 weeks. **Contraindications:** Hypersensitivity to the active substance or excipients. Clinically important, active infection. **Warnings & Precautions:** *Infections:* Potential to increase risk of infections; serious infections have been observed. Caution in patients with chronic infection or history of recurrent infection. Advise patients to seek medical advice if signs/symptoms of infection occur. Monitor patients with serious infection closely and do not administer Cosentyx until the infection resolves. Non-serious mucocutaneous candida infections were more frequently reported for secukinumab in the psoriasis clinical studies. Should not be given to patients with active tuberculosis (TB). Consider anti-tuberculosis therapy before starting Cosentyx in patients with latent TB. *Inflammatory bowel disease (including Crohn's disease and ulcerative colitis):* New cases or exacerbations of inflammatory bowel disease have been reported with secukinumab. Secukinumab, is not recommended in patients with inflammatory bowel disease. If a patient develops signs and symptoms of inflammatory bowel disease or experiences an exacerbation of pre-existing inflammatory bowel disease, secukinumab should be discontinued and appropriate medical management should be initiated. *Hypersensitivity reactions:* Rare cases of anaphylactic reactions have been observed. If an anaphylactic or serious allergic reactions occur, discontinue immediately and initiate appropriate therapy. *Vaccinations:* Do not give live vaccines concurrently with Cosentyx; inactivated or non-live vaccinations may be given. Paediatric patients should receive all age appropriate immunisations before treatment with Cosentyx. *Latex-Sensitive Individuals:* The removable needle cap of the 75mg and 150 mg pre-filled syringe and 150mg pre-filled pen contains a derivative of natural rubber latex. *Concomitant immunosuppressive therapy:* Combination with immunosuppressants, including biologics, or phototherapy has not been evaluated in psoriasis studies. Cosentyx was given concomitantly with methotrexate, sulfasalazine and/or corticosteroids in arthritis studies. Caution when considering concomitant use of other immunosuppressants. **Interactions:** Live vaccines should not be given concurrently with secukinumab. No interaction between Cosentyx and midazolam (CYP3A4 substrate) seen in adult psoriasis study. No interaction between Cosentyx and methotrexate and/or corticosteroids seen in arthritis studies. **Fertility, pregnancy and lactation:** *Women of childbearing potential:* Use an effective method of contraception during and for at least 20 weeks after treatment. *Pregnancy:* Preferably avoid use of Cosentyx in pregnancy. *Breast feeding:* It is not known if secukinumab is excreted in human breast milk. A clinical decision should be made on continuation of breast feeding during Cosentyx treatment (and up to 20 weeks after discontinuation) based on benefit of breast feeding to the child and benefit of Cosentyx therapy to the woman. *Fertility:* Effect on human fertility not evaluated. **Adverse Reactions**: *Very Common (≥1/10):* Upper respiratory tract infection. *Common (≥1/100 to <1/10):* Oral herpes, headache, rhinorrhoea, diarrhoea, nausea, fatigue. *Uncommon (≥1/1,000 to <1/100):* Oral candidiasis, lower respiratory tract infections, neutropenia, inflammatory bowel disease. *Rare (≥1/10,000 to <1/1,000)*: anaphylactic reactions, exfoliative dermatitis (psoriasis patients), hypersensitivity vasculitis. *Not known:* Mucosal and cutaneous candidiasis (including oesophageal candidiasis). *Infections:* Most infections were non-serious and mild to moderate upper respiratory tract infections, e.g. nasopharyngitis, and did not necessitate treatment discontinuation. There was an increase in mucosal and cutaneous (including oesophageal) candidiasis, but cases were mild or moderate in severity, non-serious, responsive to standard treatment and did not necessitate treatment discontinuation. Serious infections occurred in a small proportion of patients (0.015 serious infections reported per patient year of follow up). *Neutropenia:* Neutropenia was more frequent with secukinumab than placebo, but most cases were mild, transient and reversible. Rare cases of neutropenia CTCAE Grade 4 were reported. *Hypersensitivity reactions:* Urticaria and rare cases of anaphylactic reactions were seen. *Immunogenicity*: Less than 1% of patients treated with Cosentyx developed antibodies to secukinumab up to 52 weeks of treatment. *Other Adverse Effects:* The list of adverse events is not exhaustive, please consult the SmPC for a detailed listing of all adverse events before prescribing. **Legal Category:** POM. **MA Number & List Price:** PLGB 00101/1205 – 75 mg pre-filled syringe x 1 - £304.70; PLGB 00101/1029 - 150 mg pre-filled pen x2 £1,218.78; PLGB 00101/1030 - 150 mg pre-filled syringe x2 £1,218.78; PLGB 00101/1198 – 300 mg pre-filled pen x 1 £1218.78. **PI Last Revised:** June 2023. Full prescribing information, (SmPC) is available from: Novartis Pharmaceuticals UK Limited, 2nd Floor, The WestWorks Building, White City Place, 195 Wood Lane, London, W12 7FQ. Telephone: (01276) 692255.

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Adverse Event Reporting:

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Novartis via uk.patientsafety@novartis.com or online through the pharmacovigilance intake (PVI) tool at www.novartis.com/report.

If you have a question about the product, please contact Medical Information on 01276 698370 or by email at medinfo.uk@novartis.com