Quality of Life Measures for Dermatology: Definition, Evaluation, and Interpretation

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Abstract Patient-reported outcomes (PROs) have gained substantial importance in medical research and care. One of the major areas of PROs is health-related quality of life (HRQoL), which reflects the personal health condition of an individual in physical, social, emotional, and functional dimensions. Other concepts of PROs include a patient's psychological condition, satisfaction, and preferences. In a general sense, PROs summarize all facts of a medical observation or intervention reported by the patient. In most cases, these outcomes cannot be recorded by other techniques and can only poorly be measured by professionals or relatives (via proxies). This article summarizes the concepts, methodology of measurement, and interpretation of results of PROs in dermatology, with a particular focus on HRQoL. The review is based on a November 2011 literature search and additional scientific exploration by the authors. An updated systematic review on the research terms *patient reported outcomes*, *quality of life*, *patient preferences*, *willingness to pay*, and *PROs* was performed. The resulting series of publications were checked for accuracy, topical match, and content. In terms of specific outcomes tools in dermatology, 105 instruments for assessing QoL of dermatology with validated data were identified. With respect to guidelines on QoL measurement in dermatology, three specific guides were found. PROs, in particular QoL and patient preferences, are indispensable constructs in the assessment of the patient perspective in clinical care, clinical research, health services research, and clinical routine. The use of validated methodologies is recommended, and, in

most cases, validated instruments are available. Any instrument used should be checked for validity, scientific pureness, and feasibility.

Keywords Dermatology · Patient-reported outcomes · PRO · Quality of life measures · Health-related quality of life · HRQoL · Skin diseases · Psoriasis · Atopic eczema · Allergies · Skin cancer

Introduction

Until the past decade, the evaluation of medical treatment procedures was based almost solely on “objective” clinical-somatic outcomes criteria. In the last decade, recording of subjective factors such as the patient's experience, behavior, and burden of disease in a standardized and reliable manner intensified, enabling clinicians to characterize the course of disease and the effects of therapy. These factors were summed up in a broad sense under the term *quality of life* (QoL). In recent years, outcomes data deriving from patients have been named “patient reported outcomes” (PROs). Today, there is growing consensus among dermatologists and researchers that PROs are essential for the assessment of clinical interventions and care in medicine. From an economic point of view, PROs reflect the value of medical interventions rather than just the output.

The most frequently applied concept of PROs in medicine is health-related quality of life (HRQoL). Although many authors have expressed the difficulties of defining QoL (quotation: “never try to define quality of life” [1]), there is a common sense that HRQoL is a status of well-being in emotional, physical, social, and functional dimensions related to health. Accordingly, there is no specific measure of QoL; however, it is necessary to evaluate the well-being of patients in the aforementioned dimensions.

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For this, the assessment of HRQoL is multidimensional and cannot be differentially evaluated with a single scale.

This lack of objective measurement in PRO and QoL evaluation creates some uncertainty from the methodological point of view and considerable unease from the professional perspective, in particular from the doctors. In fact, the inclusion of QoL and other PRO measures is a real paradigm shift from the physician to the patient perspective in medicine.

Given the legal, ethical, and social arguments, however, there is no alternative to the measurement of HRQoL in medicine. In addition to the evaluation of the courses of therapy, the evaluation of QoL in dermatology can increase existing knowledge of the psychosocial burdens of those suffering from skin diseases. Moreover, QoL assessment can indicate the necessity of psychosocial and psychotherapeutic measures in an individual patient. In terms of health policy, QoL data can underline the need and justify the costs of dermatologic therapy, even in the absence of a vital treatment indication. In dermatologic health services research, HRQoL is an important outcomes indicator on the performance of the health system [2].

This article summarizes the state of the art of QoL conception, evaluation, and interpretation in dermatology. It provides insight in the numerous instruments developed and evaluated for specific indications in dermatology. If appropriate, the methodological aspects of QoL research are also covered. Based on scientifically sound methodological studies, recommendations are given for the state-of-the-art application of QoL instruments in skin diseases. The aim is to select the most appropriate HRQoL instrument and to find the most reliable interpretation of results. The scope of the article encompasses dermatologic studies, quality management in clinics and practices, health services research, and health economics analyses. This article does not include other PRO concepts such as utilities [3] and the patient-benefit index [4].

Definition of Quality of Life

For the specific purpose of this report, a Medline search was conducted November 2011, including the search terms “patient reported outcomes”, “quality of life”, “patient preferences” and “willingness to pay”. These were cross-referenced with search terms indicating dermatologic disorders in general (e.g. “skin diseases”) and specific diseases (e.g. “psoriasis”). The literature search resulted in 25.450 publications relating to patient reported outcomes in dermatology, including 28 % of publications on HRQoL, 25 % on patient satisfaction, 18 % on psychological factors, and 8 % on others (including willingness to pay and patient-benefit index).

The most frequently focused dermatologic diseases were chronic inflammatory skin diseases such as psoriasis and

atopic eczema (24 % and 22 %, respectively), followed by allergies (16 %) and skin cancer (12 %). The publications included reviews (45 %), case reports or other original publications (25 %), and interventional studies (20 %).

The term *quality of life* is understood very differently in everyday life and in research. Therefore, a prior precise definition of the term is crucial for its scientific use. According to the general scientific notion, QoL is a multidimensional construct that is not directly measured but can only be displayed in its single components [5, 6]. There are differing opinions regarding the areas to be included. Based on a fundamental WHO definition on health, QoL includes the physical, psychological, and social condition of an individual [7]. Several authors point out that QoL encompasses much less the objective availability of material and immaterial things as the degree with which a specifically desired state of physical, psychological, and social condition is achieved. Bullinger [8, 9] and Schipper [10] define HRQoL as the quality of the physical, psychological, social, and role- and function-associated life situation of an individual. Also taken into account in QoL is the degree of concordance between the desired and the real-life situation.

Generic QoL must be distinguished from HRQoL. The latter encompasses all QoL areas that pertain to the relevant dimensions of individual health; however, generic HRQoL must also be distinguished from disease-specific HRQoL. The former pertains to aspects of QoL and how they can appear independent of a specific illness, while the latter focuses on particular characteristics of a certain illness.

Measurement of Quality of Life

Even though an “objective” recording of QoL would be preferable, it is clear from its definition that QoL can only be recorded by self-evaluation from the patient’s perspective [11]. With respect to QoL measurement, basic methodological difficulties result from the fact that QoL isn’t directly observable but can only be quantified by means of a model.

Despite the methodological difficulty of making QoL measurable as a phenomenon, several instruments have proven beneficial in ascertaining generic HRQoL. These are normally made up of standardized questionnaires or inventories that are completed by the patients (self-evaluation) or by examiners or relatives (third-party evaluation or proxy rating). QoL questionnaires that have only a few individual items that are collectively assigned to a scale are termed *indexes* (eg, disability index).

In addition to generic questionnaires on QoL, numerous inventories that measure specific, disease-related aspects of QoL have been developed. The advantage of disease-specific instruments lies in the precise evaluation of burdens that mainly apply to those affected by the particular illness, but not for the sick in general. Moreover, clinical courses are usually best recorded by means of disease-specific questionnaires (sensitivity to change of questionnaires).

Methodology of Quality of Life Assessment

Basic studies show that QoL, despite methodological limitations, can be reasonably measured and reflects the course of a disease in a reproducible manner. The methodology and the implications have been consented in several guidelines: an FDA paper [12], an EMEA recommendation [13], the German national guidelines on QoL assessment in general [14] and in dermatology specifically [15] and a consensus paper of an EADV task force [16]. For the reporting of HRQoL outcomes

in trials, a specific CONSORT statement is under development [17]. Taken together, the guidelines give comparable recommendations for clinicians to consider during the planning phase of dermatologic evaluations. These recommendations will be discussed further in the following sections.

Choice of Instrument

Because of its straightforward manageability, standardized questionnaires for patient self-evaluation have proven their value in the assessment of HRQoL [18]. Compared with interviews, they have the advantage of faster data acquisition and analysis that is not dependent on the interviewer. Aside from the greater time efficiency, the methodological mistake that results from the patient's manipulation by the examiner is also prevented, as compared to third-party interviews. Self-evaluation requires the willingness of patients to provide information about themselves. Based on our clinical experience, this willingness is present in almost all patients, especially if they volunteered to participate in a therapy study.

Fig. 1 Decision-making process for the selection of an appropriate HRQoL instrument *Adapted from* Prinsen et al. [16]

If the to-be-examined patient group cannot provide personal information (eg, toddlers), third-party evaluations, or proxy ratings, can also be held. These evaluations also require standardized instruments. Proxy ratings are interviews with the patient's relatives or the therapist, and are to be used if the patient is not able to provide personal information [19]. They are mostly needed in studies with younger children. The age of 8 was determined as the lowest age limit for written personal information according to numerous authors [20]. However, smaller children can also provide information via pictures (eg, "smilies") or an interview form of the questionnaire, when applicable. Special inventories (ie, different from adult versions) are likewise required for older children [20].

In QoL measurement, multidimensional questionnaires, which contain multiple scales, provide greater methodological robustness than one-dimensional questionnaires or single questions [5]. However, because of organizational reasons, it is not always feasible to use extensive questionnaires in therapy studies. It is possible instead to employ only selected scales of the questionnaire, provided that these scales are valid and that the author of the questionnaire approves of this action. It should, however, be emphasized in the study protocol that QoL would only be measured in part. The use of single questions alone is methodologically insufficient in deriving statements regarding QoL. Similarly, focusing on single symptoms of disease alone (eg, physical signs only) cannot be considered a comprehensive evaluation of QoL.

Despite the emergence of international research on HRQoL assessment at this time, a lot of methodological questions—for example, the election of the optimal HRQoL instrument—have not been conclusively resolved. However, the advantages and disadvantages of the most established HRQoL questionnaire for application in dermatology were described in a comparative German study [21].

Figure 1 breaks down the complete decision-making process for selecting an appropriate HRQoL instrument.

Disease-Specific Versus Nonspecific Questionnaires

Preferably, instruments that measure the generic factors of HRQoL, as well as the disease-specific areas, should be used. The advantage of disease-specific questionnaires is their oftentimes higher differentiation capabilities and greater sensitivity to change [22, 23], whereas the advantage of generic questionnaires is better comparability with other disease groups. Given the advantages of each, the majority of health economic and clinical pharmacologic associations recommend the combined use of disease-specific as well as generic HRQoL questionnaires [24, 25].

Validation and Sensitivity to Change

Questionnaires used in therapy studies should be validated using the following validation criteria:

1. Reliability: internal consistency and retest reliability
2. Validity: construct validity (eg, verified by means of a factor analysis), convergent validity, and discriminant validity
3. Sensitivity to change: over time and as therapy effect (responsiveness)

Internal consistency means that the items of the questionnaire should be homogenous in representing its scale to ensure high-quality data. Today, a minimum value of 0.70 is required internationally for Cronbach's alpha.

Retest reliability means that the questionnaire should render approximately the same results in repeated measurements on the same patient. For example, the retake is carried out at 1-week intervals without an intermittent clinical intervention.

Convergent validity is achieved when the instrument is in accordance with other instruments that are supposed to measure the same construct. This should be determined in a large patient sample through comparison with validated inventories.

Discriminant validity means that LQ instruments should not considerably correlate with instruments that are supposed to measure different constructs.

Sensitivity to change means that changes in the QoL over time, as well as therapy effect, must coincide with the corresponding changes in the test result.

Objectivity of a HRQoL instrument is given when measurement is independent of the test procedure, the setting and the test administration, and when the results are independent of the method of analysis.

Feasibility of the Questionnaire

Should a QoL questionnaire be deployed within a clinical study, it should not needlessly disturb the course of the study. Also, the questionnaire's contents, graphic presentation, mode of questioning, and instructions should ensure good comprehension and high acceptance by the patient. The questionnaire should be of adequate length to ensure both high reliability of the inventory and minimal burden on the patient; should be self-explanatory, and should provide a favorable layout so the patients are able to complete it without help. In addition, the analysis of the questionnaire should be as simple as possible.

Table 1 Compilation of quality of life instruments in dermatology

	Disease	Questionnaire	Year	Authors/ publication
1	Acne	Acne Disability Index (ADI)	1992	Motley and Finlay [47]
2	Acne	Cardiff Acne Disability Index (CADI)	1992	Motley and Finlay [47]
3	Acne	Dermatology-Specific Quality of Life Instrument (DSQL)	1997	Anderson and Rajagopalan [31]
4	Acne	Assessment of the Psychological and Social Effects of Acne (APSEA)	1991	Layton et al. [48]
5	Acne	Acne-QOL	2001	Martin et al. [49]
6	Acne	Acne-Q(4) (short form of Acne-QOL)	2006	Tan et al. [50]
7	Acne	Freiburg Life Quality Assessment Acne (FLQA-ak)	2000	Augustin and Zschocke [51]
8	Acne	no name	1996	Girman et al. [52]
9	Acne	Acne Quality of Life (AQoL) scales	2003	Basak and Ergin [53]
10	Allergies and urticaria	Freiburg Life Quality Assessment Allergies and Urticaria (FLQA-a)	1996	Augustin et al. [54]
11	Arteriopathy, lower limb	Assessment of Quality of Life in lower limb arteriopathy (ARTEMIS)	1998	French article (Marquis et al. [55])
12	Atopic dermatitis	Parents' Index of Quality of Life in Atopic Dermatitis (PIQoL-AD)—measures QoL of parents	2005	McKenna et al. [56]
13	Atopic dermatitis	Quality of Life Index for Atopic Dermatitis (QoLIAD)	2004	Whalley et al. [57]
14	Arterial occlusive disease	Patienten mit arterieller Verschlusskrankheit-86 (PAVK-86) (patients with peripheral arterial occlusive disease-86)	1996	Bullinger et al. [58]
15	Children/family: atopic dermatitis	Kindl version für Kinder mit atopischer Dermatitis (parents' or children's version)	2002	Ravens-Sieberer and Bullinger [43]
16	Children/family: atopic dermatitis	Childhood Atopic Dermatitis Impact Scale (CADIS)	2007	Chamlin et al. [59]
17	Children/family: atopic dermatitis	Fragebogen zur Lebensqualität von Eltern neurodermitiskranker Kinder (FL-ENK) (quality of life questionnaire for parents of children suffering from neurodermatitis)	1999	Rüden et al. [60]
18	Children/family: atopic dermatitis	Lebensqualität neurodermitiskranker Kinder und Jugendlicher (LQ-ND-KJ) (quality of life questionnaire or interview of children and young people suffering from neurodermatitis)	1998	Warschburger [61]
19	Children/family: atopic dermatitis/eczema	Dermatitis Family Impact (DFI) questionnaire	1998	Lawson et al. [62]
20	Children/family: derma general	Children's Dermatology Life Quality Index (CDLQI)	1995	Lewis-Jones and Finlay [41]
21	Children/family: Derma general	Cartoon version of CDLQI	2003	Holme et al. [63]
22	Children/family: derma general	Infants' Dermatitis Quality of Life Index (IDQoL)	2001	Lewis-Jones et al. [64]
23	Children/family: immune thrombocytopenic Purpura (ITP)	ITP-Child Quality-of-Life Questionnaire	2003	Barnard et al. [65]
24	Children/family: ITP	ITP-Parental Burden Quality-of-Life Questionnaire	2003	Barnard et al. [65]
25	Children/family: Rhinitis	Paediatric Rhinoconjunctivitis Quality of Life Questionnaire (PRQLQ)	1998	Juniper et al. [66]
26	Contact dermatitis	Dermatology-Specific Quality of Life instrument for Contact Dermatitis (DSQL-CD)	1997	Anderson and Rajagopalan [31]

Table 1 (continued)

	Disease	Questionnaire	Year	Authors/ publication
27	Contact dermatitis	No access to article	2001	Holness [67]
28	Contact dermatitis, occupational dermatoses	Life Quality Index Occupational Dermatoses (LIOD)	2004	Batzdorfer et al. [68]
29	Cosmetics	Freiburg Life Quality Assessment–skin and cosmetics (FLQA-ak)	2001	Augustin and Zschocke [51]
30	Derma general	Dermatology Life Quality Index (DLQI)	1994	Finlay and Khan [30]
31	Derma general	Dermatology Quality of Life Scales (DQoLS)	1997	Morgan et al. [69]
32	Derma general	Family Dermatology Life Quality Index (FDLQI)	2007	Basra et al. [70]
33	Derma general	Skindex-29	1996, 1997a,b	Chren et al. [38]
34	Derma general	Skindex-16	2001	Chren et al. [71]
35	Derma general	Skindex-17	2006	Nijsten et al. [72]
36	Derma general	Freiburg Life Quality Assessment-basis BZW FLQA-b)/ Freiburg Life Quality Assessment-core (FLQA-c)	2004	Augustin et al. [73]
37	Derma general	Freiburg Life Quality Assessment-Chronische Dermatosen (FLQA-d)	1997	Augustin et al. [73]
38	Derma general	Marburger Hautfragebogen (Marburg skin questionnaire for coping with skin diseases)	1997	Stangier et al. [74]
39	Derma general	Deutsches Instrumentes zur Erfassung der Lebensqualität bei Hauterkrankungen (DIELH) (German instrument for the assessment of quality of life in skin diseases) [132]	2001	Schäfer et al. [132]
40	Derma general	Qualita di Vita Italiana in Dermatologia (QUAVIDERM) (Italian in- strument for the assessment of quality of life in skin diseases)	1997	Lisi et al. [75]
41	Derma general	Leisure Questionnaire	1987	Ryan [76]
42	Derma general	Adjustment to Chronic Skin Diseases Questionnaire (ACS)	2003	Stangier et al. [77]
43	Derma general	Impact of Skin Disease Scale (IMPACT)	1989	Wessely and Lewis [78]
44	Derma general	VQ-Dermato (French instrument for the assessment of quality of life in skin diseases)	1999	Grob et al. [79]
45	Derma general	Turkish quality of life instrument for skin disease (TQL)	2005	Gurel et al. [80]
46	Eczema	Patient-Oriented Eczema Measure (POEM)	2004	Charman et al. [81]
47	Eczema	Eczema Disability Index (EDI)	1993	Salek et al. [82]
48	Hair	Kingsley Alopecia Profile (KAP)	2004	Kingsley [83]
49	Hair	Freiburg Life Quality Assessment Haare (FLQA-ha)	1999	Augustin and Zschocke [51]
50	Hair	Hairdex	2001	Fischer et al. [40]
51	Herpes	Freiburg Life Quality Assessment Herpes (FLQA-h)	1996	Augustin and Zschocke [51]
52	Herpes, genital, recurrent	Recurrent Genital Herpes QOL Questionnaire (RGHQoL)	1998	Doward et al. [36]
53	HIV with skin disease	HIV-DERMDEX	2001	Aftergut et al. [133]
54	Hyperhidrosis	Freiburg Life Quality Assessment Hyperhidrose (FLQA-hy)	2001	Augustin and Zschocke [51]
55	Hyperhidrosis	Hyperhidrosis Impact Questionnaire (HHIQ)	2002	Teale et al. [84]
56	Hyperhidrosis	No name	2003	Milanez de Campos et al. [85]
57	Hyperhidrosis	No name (“our novel hyperhidrosis scale”)	2001	Keller et al. [86]

Table 1 (continued)

	Disease	Questionnaire	Year	Authors/ publication
58	Hyperhidrosis	“instrument to measure quality of life of patients with hyperhidrosis”	2004	Kuo et al. [87]
59	Hyperhidrosis, palmar	No name	2005	Baumann et al. [88]
60	Lymphoedema, chronic	Freiburg Life Quality Assessment Lympherkrankungen (FLQA-l)	2005	Augustin et al. [89]
61	Melanoma	FACT-Melanoma	2008	Cormier et al. [90]
62	Melanoma, malignant	European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C36), a study-specific malignant melanoma (MM) module	1993	Sigurdardóttir et al. [91]
63	Melasma	Melasma Quality of Life (MELASQoL) scale	2003	Balkrishnan [92]
64	Nonmelanoma skin cancer	Skin Cancer Index (SCI)	2006	Rhee et al. [93]
65	Nonmelanoma skin cancer, facial	Facial Skin Cancer Index (FSCI)	2005	Matthews et al. [94]
66	Onychomycosis	Onychomycosis Quality of Life questionnaire (ONYCHO)	1999	Drake et al. [95]
67	Onychomycosis	Onychomycosis Disease-Specific Questionnaire (ODSQ)	2000	Turner and Testa [96]
68	Onychomycosis	NailQoL	2007	Warshaw et al. [97]
69	Onychomycosis	No name	1999	Lubeck et al. [98]
70	Onychomycosis, toenail	OnyCOE-t	2006	Potter et al. [99]
71	Psoriasis	Psoriasis Disability Index (PDI)	1987; modified: 1990	Finlay and Kelly [35]
72	Psoriasis	12-item Psoriasis Quality of Life Questionnaire (PQOL-12)	1990	Koo et al. [100]
73	Psoriasis	Psoriasis Life Stress Inventory (PLSI)	1995	Gupta and Gupka [101]
74	Psoriasis	Psoriatic Arthritis Quality of Life (PSAQoL) instrument	2004	McKenna et al. [102]
75	Psoriasis	Psoriasis Index of Quality of Life (PSORIQoL)	2003	McKenna et al. [103]
76	Psoriasis	ItchyQoL—pilot version	2008	Desai et al. [104]
77	Psoriasis	Psoriasis Quality of Life Questionnaire (PQLQ)	2006	Inanir et al. [105]
78	Psoriasis arthritis	No access to name	2003	Coaccioli et al. [106]
79	Rhinitis	Rhinitis Quality of Life Questionnaire (RQLQ)—standardized version	1999	Juniper et al. [107]
80	Rhinitis	Rhinitis Quality of Life Questionnaire (RQLQ)	1991	Juniper and Guyatt [108]
81	Rhinitis	mini Rhinoconjunctivitis Quality of Life Questionnaire (miniRQLQ)	2000	Juniper et al. [109]
82	Rhinitis, nocturnal	Nocturnal Rhinoconjunctivitis Quality of Life Questionnaire (NRQLQ)	2003	Juniper et al. [110]
83	Rhintis	Fragebogen zur Lebensqualität bei Heuschnupfen (FLHeu) (FLHEu questionnaire on quality of life for hay fever)	2001	Kupfer et al. [111]
84	Rosacea	RosaQoL	2007	Nicholson et al. [112]
85	Scalp dermatitis	Scalpdex	2002	Chen et al. [113]
86	Skin tumors	Freiburg Life Quality Assessment Tumoren (FLQA-t)	1997	Augustin and Zschocke [51]
87	Systemic lupus erythematosus (SLE)	Systemic Lupus Erythematosus Quality of Life Questionnaire (L-QoL)	2008	Doward et al. [114]

Table 1 (continued)

	Disease	Questionnaire	Year	Authors/ publication
88	SLE	SLEQOL	2005	Leong et al. [115]
89	SLE	LupusQoL	2007	McElhone et al. [116]
90	Systemic sclerosis	Scleroderma Health Assessment Questionnaire (SSc HAQ)	1997	Steen and Medsger [117]
91	Systemic sclerosis	Scleroderma Gastrointestinal Tract 1.0 (SSC-GIT 1.0)	2007	Khanna et al. [118]
92	Ulcers, chronic	Freiburg Life Quality Assessment Wunden (FLQA-w)	1999	Augustin and Zschocke [51]
93	Ulcers, diabetic foot	AOFAS diabetic foot questionnaire	2005	Dhawan et al. [119]
94	Ulcers, diabetic foot	Diabetic Foot Ulcer Scale (DFS)	2003	Bann et al. [120]
95	Ulcers, leg and foot	Leg and Foot Ulcer Questionnaire (LFUQ)	1994	Hyland et al. [121]
96	Ulcers, lower limb	Cardiff Wound Impact Schedule (CWIS)	2004	Price and Harding [122]
97	Ulcers, venous	Charing Cross Venous Ulcer Questionnaire (CCVUQ or CXVUQ)	2000	Smith et al. [123]
98	Ulcers, venous leg	Venous Leg Ulcer Quality of Life (VLU-QoL) questionnaire	2007	Hareendran et al. [124]
99	Urticaria, chronic	Chronic Urticaria Quality of Life Questionnaire (CU-QoL or CU-Q[2] oL)	2005	Baiardini et al. [125]
100	Venous insufficiency	Aberdeen Varicose Veins Questionnaire (AVVQ)	1999	Smith et al. [126]
101	Venous insufficiency, chronic	Freiburg Life Quality Assessment Venenerkrankungen (FLQA-vs)	1997	Augustin et al. [127]
102	Venous insufficiency, chronic	Tübinger Fragebogen zur Messung der LQ von CVI-Patienten (TLQ-CVI) (Tübingen Questionnaire for measuring the QoL of patients with chronic venous insufficiency)	1998	Klyszcz et al. [128]
103	Venous insufficiency, lower limb, chronic	CIVIC (quality of life instrument for chronic lower limb venous insufficiency)	1996	Launois et al. [129]
104	Vitiligo	Freiburg Life Quality Assessment Vitiligo (FLQA-vit)	2001	Augustin and Günther [130]
105	Warts, anogenital	Cuestionario Específico en Condilomas Acuminados (CECA) disease-specific quality of life questionnaire for patients with anogenital condylomata acuminata	2005	Badia et al. [131]

Creation of Subscales and Determination of Scores

All single questions that pertain to a certain dimension of QoL form a subscale. The subscale value can be calculated from the average score or from the cumulative values of the single questions. For reliability reasons, it is reasonable to calculate the subscales of QoL with not just one but several questions each. Thus, outliers of single items and coincidental answers carry less weight.

Cross-cultural Use of HRQoL Instruments

A large number of studies have shown that the understanding and the results of HRQoL instruments depend on cultural, educational and semantic factors [26, 27]. For this, a very

accurate use of any instrument adapted to the specific target group is needed. If questionnaires from other languages are to be used, they should be translated and re-translated in a systematic manner, including independent double-translations into both directions. After that, the resulting translations need to be compared in order to gain a consented final version. Finally, controls for validity in any new language are recommended.

Comparison Group

The comparison of averaged results with other patient samples is essential to the interpretation of the QoL results. This can be patient subgroups of the same study or patients of other studies who have the same or a different illness.

Therefore, it is desirable that comparative data of the QoL questionnaire can be derived from a reliable data pool.

Transferability to Pharmacoeconomic Cost-Benefit Analysis

Should a cost-benefit analysis be conducted within the clinical study, and the QoL be adopted as a benefit, there should be a utilizable score that is calculable for this purpose (eg, a mapping to utility measures would be feasible).

Available Dermatology-Specific QoL Inventories

The construction of a new questionnaire is an elaborate process that should only be approached with psychometric help. Hence, it is preferable to use existing questionnaires. The development of a questionnaire is exploratively possible in a study parallel to the use of a standardized procedure, but it must run through several stages: item retrieval (eg, focus groups), formulation/verbal pretest, implementation on at least 100 patients, psychometric analyses for reliability and validity, and retake of measurements after one week (without intervention) for the determination of the retest reliability and after an intervention for the determination of sensitivity to change [5, 28].

In addition, a questionnaire that was translated from another language should be validated anew for the exemption from language and cultural differences before its use [26, 29]. For example, multilingual versions of the following validated instruments are available for the assessment of QoL in dermatology:

- Cardiff Acne Disability Index [29]
- Dermatology Life Quality Index [30]
- Dermatology-Specific Quality of Life instrument [31]
- Eczema Disability Index [32]
- Freiburg Life Quality Assessment [33, 34]
- Psoriasis Disability Index [35]
- Recurrent Genital Herpes Quality of Life Questionnaire [36]
- Rhinitis Quality of Life Questionnaire [37]
- Skindex [38, 39]
- Hairdex [40]

The following instruments are for use with children specifically: Children's Dermatology Life Quality Index [41], Pediatric Symptom Checklist [42], and a version of the Kindl questionnaire for children with atopic dermatitis [43].

An overview of the QoL instruments available in German was compiled into a monograph by Kupfer [44]. Table 1 provides a comprehensive list of instruments.

References on the Sourcing of QoL Questionnaires

QoL questionnaires can mostly be obtained from the particular authors. General overviews can be obtained from Bulinger [5, 26] and Bowling [18], and QoL questionnaires on dermatology from Salek [32], Finlay [45], and Kupfer [44]. Usage rights also lie, in part, with the publishing company (leading in Germany: Hogrefe publishing and Beltz-Test), so that the questionnaires must be obtained and, if applicable, royalties paid.

Predictors of HRQoL

To better understand the QoL construct and develop strategies for improving HRQoL in dermatology, predictor studies on a variety of indications have been performed. The predictors identified both depended on disease-specific factors and on the predictors included in the model. For example, HRQoL in psoriasis, as measured by the Dermatology Life Quality Index, was most strongly predicted by the time needed for treatment [46]. In another predictor study on patients with atopic eczema, HRQoL was predicted by four major factors: clinical symptoms, emotional distress, problems with social contacts, and helplessness. These differences support the development of disease-specific strategies for the improvement of QoL in patients with skin diseases.

Conclusion

HRQoL should be considered in dermatologic trials and routine as additional outcomes parameters alongside clinical and, if applicable, economic criteria.

Several dimensions of HRQoL can be assessed. HRQoL can be measured in a simple and relatively method-proof manner through self-assessment questionnaires. Validated questionnaires that reflect generic as well as disease-specific HRQoL are recommended. In addition, if these are to be used in longitudinal studies, they must exhibit sufficient sensitivity to change (responsiveness). Before using a questionnaire, its validation properties (validity and reliability) should be evaluated.

Several validated questionnaires for HRQoL assessment in skin diseases, allergies, wound healing, and venous diseases are available. Foreign-language inventories require revalidation, including double-retranslation to a given language.

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