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New developments in the psychometric testing of Patient-Reported Impact of Dermatological Diseases (PRIDD): responsiveness and minimally important change

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INTRODUCTION

- The Patient-Reported Impact of Dermatological Diseases (PRIDD) is a dermatology-specific multidimensional measure of the impact of skin conditions on patients' lives, developed in partnership with over 5600 patients from 96 different countries.

- PRIDD was developed according to the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) and has demonstrated good reliability (internal consistency, test-retest reliability and measurement error) and validity (content, construct and criterion validity).

This study aimed to test responsiveness and propose an anchor-based minimally important change (MIC) for PRIDD.

MATERIALS & METHODS

Study design: Observational longitudinal study involving two global online surveys, administered approximately 6 weeks apart. The survey was available in 17 languages, with data from English respondents analyzed in this study.

Patients: Adults (≥ 18 years) with self-reported dermatological conditions, recruited through patient organizations and social media, between June 2023 and January 2024.

Measures:

PRIDD

Patient-Reported Impact of Dermatological Diseases

PRIDD comprises 16 items that take less than 2 minutes to answer in a rating scale from "never" to "always".

It is a multidimensional measure that provides a total impact score, as well as scores for four impact dimensions.

Scores are calculated by summing item raw scores and converting them to interval-level data. Higher scores indicate higher impact.

Global Perceived Effect (GPE) scale

The GPE scale was used as a patient-based anchor at survey 2, asking participants to rate changes in the impact of their dermatological condition since survey 1.

Responses were given on a six-point ordinal response scale: -2 = "much worse"; -1 = "slightly worse"; 0 = "no change"; 1 = "slightly improved"; 2 = "much improved"; and 3 = "completely improved".

The cut-off for MIC was determined by participants, who selected the smallest improvement they considered meaningful from the GPE response options.

RESULTS

Participants: From the 1283 participants who completed both surveys, 587 were valid (i.e. met all inclusion criteria and had no missing data on core variables) and completed the survey in English. Participants were 83.0% female, mean age was 53.3 ± 15.3 years (range 18-95), from 34 different countries (e.g., 33.4% United States, 27.3% United Kingdom, 14.7% Canada, 8.7% Ireland), and across 63 primary diagnoses (e.g., 20.6% Lichen Sclerosus, 9.4% Hidradenitis Suppurativa, 6.5% Psoriasis, 6.3% Ichthyosis).

Responsiveness: PRIDD responsiveness was evaluated using a construct approach, testing the hypothesis (H1) whether PRIDD change score (survey 2 – survey 1) differed across GPE categories: "worse," "no change," and "improved". As negative values reflect reduced impact, we expected higher positive PRIDD change scores in the "worse" group, near-zero in the "no change" group, and higher negative in the "improved" group.

Differences in PRIDD change scores were statistically significant across GPE categories, for the total score and for impact dimensions (multivariable test: Wilks' $\lambda = 0.89$, $F = 8.72$, $p < 0.001$, $\eta^2 = 0.06$), confirming responsiveness (Table 1).

Table 1 | Descriptive statistics and univariable analysis of variance (ANOVA) comparing changes in PRIDD scores from survey 1 (S1) to survey 2 (S2), across GPE meaningful change groups.

	Worse (n = 105)	No change (n = 378)	Improved (n = 104)	ANOVA		
PRIDD change score S2 - S1	M ± SD	M ± SD	M ± SD	F	p	η^2 *
Total impact	1.37 ± 3.68	-0.63 ± 4.54	-3.67 ± 6.40	29.70	< 0.001	0.09
Physical impact	0.41 ± 2.08	-0.15 ± 2.23	-1.34 ± 2.31	17.70	< 0.001	0.06
Life responsibilities impact	0.61 ± 2.25	-0.22 ± 2.41	-1.81 ± 2.89	26.57	< 0.001	0.08
Psychological impact	0.25 ± 1.79	-0.31 ± 1.91	-1.17 ± 2.32	14.04	< 0.001	0.05
Social impact	0.73 ± 2.12	-0.20 ± 2.18	-1.00 ± 2.71	15.24	< 0.001	0.05

* $\eta^2 \geq 0.01$ = small effect, $\eta^2 \geq 0.06$ = medium effect, $\eta^2 \geq 0.14$ = large effect.

Minimally Important Change (MIC): The GPE was considered an acceptable anchor, with a Spearman rank correlation with PRIDD change total score of $\rho = -0.31$.

Using the mean change method, MIC was estimated based on participants whose GPE response matched their selected threshold for meaningful improvement (e.g., those who reported "slightly improved" and identified "slightly improved" as the smallest meaningful change). The MIC estimate corresponded to the average PRIDD change score within this subgroup Table 2). A change of ≥ -5.34 points in the PRIDD total score can be interpreted as a clinically significant improvement.

Table 2 | Mean change scores of PRIDD according to responses to the GPE and anchor-question.

		Change in PRIDD total score S2 – S1	
Global Perceived Effect (GPE)	n	M_{change} (SD_{change})	95% CI
Much worse	6	8.12 (3.14)	4.83/ 11.41
Slightly worse	99	0.96 (3.30)	0.30/ 1.62
No change	378	-0.63 (4.54)	-1.09/ -0.17
Slightly improved	86	-2.09 (4.37)	-3.03/ -1.15
Much improved	12	-8.96 (7.37)	-13.65/ -4.28
Completely improved	6	-15.73 (10.73)	-26.99/ -4.47
GPE * Anchor-question	n	M_{change} (SD_{change})	95% CI
Not meaningfully improved	58	-2.20 (4.90)	-3.496/ -0.91
Minimally meaningful improved	45	-5.34 (7.53)	-7.60/ -3.08
More than minimally meaningful improved	1	-13.75 (-)	-/-

DISCUSSION/ CONCLUSION

PRIDD is responsive and capable of detecting meaningful change over time. These findings confirm its suitability as a robust measure for use in patient care and clinical trials. Incorporating the patient perspective into the MIC estimate enhances the evaluation of intervention effectiveness by anchoring it in changes that matter most to patients.

PRIDD is the first dermatology-specific patient-reported outcome measure (PROM) of life impact to meet the COSMIN criteria across all seven measurement properties, establishing it as a rigorously validated tool for assessing the impact of dermatological conditions. This validation supports its use in both clinical practice and research, contributing to person-centered care and improving patient outcomes in dermatology.

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