Psychometric testing of the Patient-Reported Impact of Dermatological Diseases (PRIDD) measure

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Introduction

Existing dermatology-specific patient-reported outcome measures (PROMs) do not fully capture the substantial physical, psychological, and social impact on patients' lives and are not recommended for use according to the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) criteria. Most were developed with insufficient patient involvement and relied on classical psychometric methods. **We developed the Patient-Reported Impact of Dermatological Diseases (PRIDD) measure in close partnership with patients.** PRIDD has strong evidence of content validity, structural validity, internal consistency, acceptability, and feasibility.

Aims & Objectives

This study tested PRIDD's remaining **measurement properties** using both classic and modern psychometric methods and evaluated these against the COSMIN criteria.

GRIDD
Global Research on the Impact of Dermatological Diseases

Materials & Methods

- A worldwide longitudinal study consisting of two online surveys administered 2-4 weeks apart.
- Adults (≥ 18 years) living with a dermatological condition were recruited through GlobalSkin's (International Alliance of Dermatology Patient Organization) global membership network.
- Participants completed PRIDD, a demographics questionnaire, and other related measures (e.g. Dermatology Life Quality Index).

Survey 1

504 participants; **35** conditions; **38** countries	Rasch analysis, structural validity, internal consistency, construct validity, floor and ceiling effects

Survey 2

272 participants; **27** conditions; **26** countries	Test-retest reliability, measurement error, responsiveness, Minimally Important Change (MIC)

Results

987 patients with **60 dermatological conditions** from **55 countries** participated. A four-factor model showed best fit. PRIDD fit the Rasch model (χ^2 = 37.26, p = 0.11), showed no local dependency or Differential Item Functioning (DIF) at the test level, and was well-targeted. A summary of PRIDD's measurement properties and interpretability information evaluated against the COSMIN quality criteria is provided:

		Requirement	Rating	Results
Structural validity	Unidimensionality	- No violation of unidimensionality - No violation of local independence - Adequate model fit: χ^2 >0.01	+	PRIDD and all subscales unidimensional with no local dependency. χ^2 = 0.11
	Structural validity	CFI or TLI or comparable measure > 0.95 OR RMSEA < 0.06 OR SRMR < 0.08	+	CFI = 0.96; TLI = 0.97; RMSEA = 0.09; SRMR = 0.03
Internal consistency		Person Separation Index ≥ 0.7	+	Person Separation Index = 0.89
Hypothesis testing for construct validity		75% of hypotheses met	+	76% of hypotheses met
Test-retest reliability		ICC or weighted Kappa ≥ 0.70	+	ICC = 0.93
Measurement error		SDC or LoA < MIC	+	LoA (1.3) < MIC (4.14) Unable to determine anchor-based MIC
Responsiveness		The result is in accordance with the hypothesis OR AUC ≥ 0.70	-	0 hypotheses met
Floor & ceiling effects		Considered present when > 15% of the patients achieved the minimum or maximum possible score	+	< 0.9% with minimum or maximum score
MIC		N/A		Unable to determine anchor-based MIC

"+" = sufficient, " –" = insufficient, "?" = indeterminate

CFI: Comparative Fit Index; TLI ; Tucker-Lewis Index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardised Root Mean Square; ICC: Intraclass Correlation Coefficient; SDC: Smallest Detectable Change; LoA: Limits of Agreement; MIC: Minimally Important Change

Conclusion

PRIDD is a valid and reliable tool to help clinicians provide better care and stakeholders to understand the global burden of dermatological disease. It is the first theory-led dermatology-specific PROM tested across all seven COSMIN measurement properties. The results indicate that **PRIDD is the only dermatology-specific PROM to meet the COSMIN criteria to be recommended for use**. Our findings confirm the value of developing and validating PROMs with a patient-centred approach and using modern psychometric methods. PRIDD has been undergone cross-cultural translation and linguistic validation in 16 languages. We are currently collecting global data on the life impact of dermatological conditions and completing further testing of measurement error, responsiveness and MIC.

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