

# Comparing EQ-5D-5L, PROPr, SF-6D and TTO utilities in patients with chronic skin diseases

## OBJECTIVES

We aim to compare the measurement properties of three indirect (EQ-5D-5L, Patient-Reported Outcomes Measurement Information System-Preference score [PROPr] based on PROMIS-29+2 and Short-form 6-dimensions [SF-6Dv1] based on SF-36) and a direct (conventional 10-year time trade-off [TTO]) utility assessment methods in patients with chronic skin diseases.

## METHODS

In November 2020, 120 patients with physician-diagnosed chronic skin diseases (mean age 49 years, female 61%) completed an online cross-sectional survey in Hungary (Table 1).

US value sets were used for the EQ-5D-5L and PROPr, and the UK one for the SF-6D. Floor, ceiling, convergent and known-group validity were compared across the four utility measures. Known-groups were created based on the first item of SF-36 and the first four items of PROMIS Global Health (general health, quality of life, physical and mental health). The agreement between utilities was analyzed using Bland-Altman plots.

**Table 1.**  
Characteristics of the study population

Diagnoses	n (%)
psoriasis	47 (39.2%)
atopic dermatitis	32 (26.7%)
acne	23 (19.2%)
other	24 (20.0%)
<b>mean ± SD</b>	
EQ VAS (0-100)	74.22 ± 20.22
EQ-5D-5L (-0.573-1)	0.79 ± 0.24
SF-6Dv1 (0.296-1)	0.71 ± 0.15
PROPr (-0.022-0.954)	0.47 ± 0.24
TTO (0-1)	0.89 ± 0.23

## RESULTS

Mean PROPr utilities were significantly lower than EQ-5D-5L, SF-6D and TTO utilities ( $p < 0.05$ ) (Table 1). The ceiling was 65% for the TTO, 27% for the EQ-5D-5L, 2% for the SF-6D and 0% for the PROPr. Floor effect was not observed. Indirectly assessed utilities showed strong correlations with each other (range of  $r_s = 0.771$  to  $0.859$ ), while the TTO exhibited weak correlations with indirect utilities (range of  $r_s = 0.171$  to  $0.180$ ) (Table 2).

The EQ-5D-5L was able to better discriminate between known groups of patients defined based on general health, quality of life and physical health, while the SF-6D and PROPr outperformed the EQ-5D-5L for mental health problems (Table 3).

The intra-class correlations (range of ICCs =  $0.381$  to  $0.596$ ) indicated fair, while the Bland-Altman plots indicated good agreements between indirect utilities (Figure 1).

**Table 2.**  
Spearman's correlations between health utilities

	EQ-5D-5L	SF-6Dv1	PROPr
EQ-5D-5L	–	–	–
SF-6Dv1 (from SF-36)	0.771	–	–
PROPr (from PROMIS-29+2)	0.771	0.859	–
Conventional TTO (10-year)	0.180	0.174*	0.171*

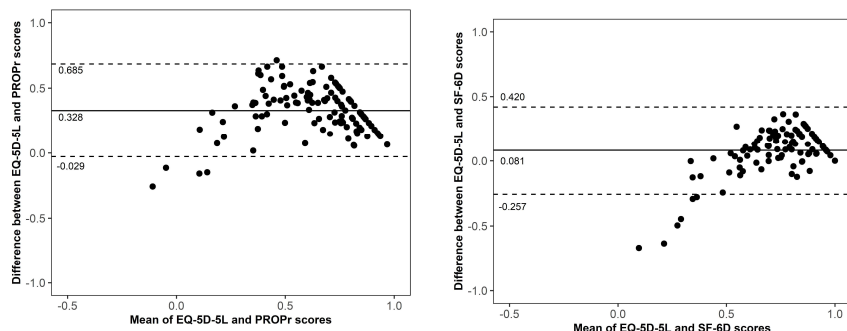
\*All correlation coefficients were significant except in cases have been marked ( $p > 0.05$ ).

**Table 3.**  
Known-groups validity of the health utilities

	Relative efficiency compared to EQ-5D-5L		
	SF-6Dv1	PROPr	TTO
Self-perceived health status (SF-36 – Q1)	0.859	0.756	0.105
Self-perceived general health (PROMIS Global Health – Q1)	0.910	0.759	0.012
Self-perceived general quality of life (PROMIS Global Health – Q2)	0.787	0.914	0.193
Self-perceived general physical health (PROMIS Global Health – Q3)	0.948	0.705	0.190
Self-perceived general mental health (PROMIS Global Health – Q4)	1.505	1.513	0.026

SF-36 = Short-form-36;

The differences in the scores between known groups were executed by Kruskal Wallis tests, where all indirect utilities' p-values ( $p < 0.05$ ) were statistically significant while the p-values of TTO  $> 0.05$ .



**Figure 1.**

Bland-Altman plots of the EQ-5D-5L and PROPr and EQ-5D-5L and SF-6D index scores

## CONCLUSIONS

Utilities measured by different instruments showed a great variability in patients with chronic skin conditions. All indirect methods exhibited generally good measurement properties. Our findings help to understand the differences across these measures and support the choice of instrument for quality-adjusted life year calculations in cost-utility analyses.