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Research letter

Assessing the validity, responsiveness and reliability of the Recap measure of eczema control

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DEAR EDITOR, Research comparing the effectiveness of different eczema treatments is limited by inconsistency in both outcomes assessed and the measures used. Harmonising Outcome Measures for Eczema recommends a core set of outcomes to be reported in all trials of eczema treatments.¹ Recap of atopic eczema (Recap) is a seven-item patient-reported instrument recommended for capturing eczema control.² Initial validation work is encouraging, but the validity of Recap in different populations is uncertain, as is its reliability and responsiveness.^{2,3}

We investigated the acceptability, construct validity, responsiveness and reliability of Recap. This study was approved by University of Bristol Research and Enterprise Development and the Faculty of Health Sciences Research Ethics Committee (reference 2018-4887).

Online questionnaires were administered 2 weeks apart and included Recap, validated scales of eczema severity [Patient-Oriented Eczema Measure (POEM)] and quality of life [Patient-Reported Outcomes Measurement Information System (PROMIS)].^{4,5} People with eczema and carers of children with eczema were recruited through social media and via patient charities and organizations.⁶

To evaluate the construct validity of Recap, the following hypotheses were prespecified:

- (i) Eczema control worsens with increasing disease severity.
- (ii) Poorer eczema control is associated with worse quality of life.
- (iii) Eczema control worsens with disease 'bother', as captured by 'How much bother has your eczema been over the past week?' (0 none, 10 maximum).
- (iv) A self-reported improvement/worsening in eczema would equate to a decrease/increase in Recap score, respectively.

The group of participants comprised 218 (57.4%) adults and 162 (42.6%) children; for 156 (96.3%) children, questionnaires were completed by parent proxy. The mean age was 34.2 years (SD 11.6, range 18–70) for adults, and 6.1 years (SD 4.7, range 0–17) for children. There were more female adult participants (87.6%) than female children (46.3%). Most respondents resided in the UK ($n = 315$, 87.5%) and were white ($n = 311$, 81.8%). The age and sex

characteristics of people at baseline ($n = 380$) and those who completed ($n = 188$) or did not complete ($n = 166$) the follow-up questionnaire were similar.

Recap had a high (99.7%) completion rate with a good distribution of scores [mean score adults 14.0 (SD 6.6); mean score children 13.3 (SD 7.4)] and no floor or ceiling effects were observed. Overall, 0.9% of adults and 3.7% of child participants had the minimum Recap score; 2.8% of adults and 1.2% of child participants had the maximum Recap score. A high internal consistency for Recap was observed (adult Cronbach's $\alpha = 0.89$, child Cronbach's $\alpha = 0.92$).

Hypothesized associations between Recap and other variables were observed. More severe disease (POEM) was associated with poorer eczema control (Recap) (Pearson's correlation coefficient, adults 0.82, $P < 0.001$; children 0.90, $P < 0.001$). Poorer eczema control (Recap) was associated with a worse self-rated global eczema control (Spearman's rank correlation coefficient, adults 0.73, $P < 0.001$; children 0.85, $P < 0.001$). Poorer eczema control (Recap) was also associated with a poorer quality of life (PROMIS) (Pearson's coefficient, adult mental health -0.43 , $P < 0.001$; adult physical health -0.12 , $P = 0.0088$; children overall health -0.29 , $P = 0.0002$). Recap was also associated with the bother score (Pearson's coefficient, adults 0.82, $P < 0.001$; children 0.87, $P < 0.001$).

Recap had a high intraclass correlation coefficient (ICC) for participants whose eczema severity was unchanged after 2 weeks [adult ICC = 0.85, $n = 44$, confidence interval (CI) (0.7451–0.9166); child ICC = 0.89, $n = 33$ (CI 0.7992–0.9488)], indicating good test–retest reliability. Responsiveness to change was demonstrated by the expected associations between Recap and self-reported change in severity of eczema (Table 1), and change scores for Recap and POEM. Participants who reported that their eczema was the 'same' at week 2 compared with baseline showed minimal change in Recap scores [mean Recap change score, adults -0.2 (SD 0.5), children -1.1 (SD 0.5)]. Moreover, self-reported changes in eczema severity were associated with corresponding changes in Recap score in the expected direction. Similarly, change scores for Recap and POEM were positively associated for both adults (Pearson's correlation coefficient 0.66, $P < 0.001$) and children (Pearson's correlation coefficient 0.72, $P < 0.001$).

The main limitations of this study were the reliance on an online survey and a low follow-up rate (56.3%). Recall bias, and hence the ICC, were affected by different test–retest intervals. We relied on participant self-report of eczema diagnosis and symptoms; however, most participants (94.5% adults,

Table 1 Change in Recap of atopic eczema (Recap) scores by self-reported change in eczema severity

	Adult (n = 108)		Child (n = 76)	
	Number (%) of participants	Mean (SD) Recap change	Number (%) of participants	Mean (SD) Recap change
Much better	7 (6.5)	-4.9 (0.9)	5 (6.6)	-9.0 (4.1)
Better	30 (27.8)	-4.1 (0.7)	16 (21.1)	-5.1 (1.1)
Same	44 (40.7)	-0.2 (0.5)	33 (43.4)	-1.1 (0.5)
Worse	23 (21.3)	2.8 (0.6)	19 (25.0)	1.7 (1.0)
Much worse	4 (3.7)	4.0 (1.5)	3 (3.9)	3.3 (2.0)

Data were missing for four participants.

93.2% children) met the UK working party criteria for atopic eczema.⁶ Further studies should evaluate how Recap performs in people with milder disease (most participants had moderate-to-severe disease) and in different cultures and languages (only an English language version was available).

In summary, Recap appears to have good acceptability, validity, test-retest reliability and responsiveness to change. Further work is required to investigate its validity in community and clinic populations.

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