ORIGINAL REPORT

Validation of the Atopic Dermatitis Control Tool (ADCT) and a Comparison with the Recap of Atopic Eczema Questionnaire (RECAP)

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The Atopic Dermatitis Control Tool (ADCT) has not been validated in the Dutch population, and comparisons with the Recap of atopic eczema (RECAP) questionnaire are still lacking. This prospective study was conducted at a Dutch tertiary hospital between June 2021 and December 2022, to assess measurement properties of the Dutch ADCT in adults with atopic dermatitis (AD) and compare it with RECAP. Participants completed the ADCT, RECAP, and reference instruments including Patient's Global Assessment (PtGA), Patient-Oriented Eczema Measure (POEM), Dermatology Life Quality Index (DLQI), quality-of-life questionnaire of the EuroQol Group (EQ-5D-5L), Numeric Rating Scale (NRS) peak itch/sleep disturbance, Skindex-29, and Global Rating of Change (GRC), at baseline, 1–3 days, and 4–12 weeks. Construct validity was assessed through *a priori* hypotheses, whilst reliability was evaluated with standard error of measurement ($SEM_{agreement}$) and intraclass correlation coefficient ($ICC_{agreement}$). Interpretability was examined using anchor-based approaches. In total, 196 adults with AD were included. Among *a priori* hypotheses, 82% (single-score validity) and 59% (responsiveness) were confirmed. The $SEM_{agreement}$ was 1.15, and the $ICC_{agreement}$ was 0.983. The final bandings for the ADCT were established, with a binary cutoff of ≥6 indicating uncontrolled AD. The smallest detectable change (SDC) was 3.2, and the minimally important change (MIC) value from predictive modelling was 2.9. Furthermore, the ADCT exhibited high correlations with RECAP at all levels (most correlations being above 0.80). These results demonstrated the Dutch ADCT as a valid, reliable, and responsive tool, and have important clinical implications.

Key words: atopic dermatitis; validation; comparison; eczema control; ADCT; RECAP.

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SIGNIFICANCE

Atopic dermatitis is a chronic skin disease. To measure how well atopic dermatitis is controlled, the Atopic Dermatitis Control Tool was developed. Current research focused on testing its relevance, reliability, sensitivity to detect changes, the interpretation of total scores, and comparing it with another similar instrument, the Recap of atopic eczema questionnaire. Our results showed that the Atopic Dermatitis Control Tool was accurate and sensitive in measuring eczema control over time. A score of ≥6 on the Atopic Dermatitis Control Tool indicates poor disease control, with an improvement of ≥4 points indicating significant improvement. The Atopic Dermatitis Control Tool and Recap of atopic eczema were very similar and largely interchangeable.

The Atopic Dermatitis Control Tool (ADCT) has been recommended by the Harmonising Outcome Measures for Eczema (HOME) initiative as a core outcome instrument for measuring eczema control in both clinical trials and clinical practice (1, 2). The ADCT consists of 6 items tailored to atopic dermatitis (AD)-specific symptoms (e.g., intense itch, sleep disturbances), and impact on patients' daily functioning and emotional well-being (3). Each individual item is scored on a 4-point scale, leading to a total score of 0–24 points, with higher scores indicating poorer eczema control (3). The ADCT has demonstrated good-to-excellent content and construct validity, known group validity, and reliability in the original version, with a threshold of ≥7 being determined to identify patients whose AD remains inadequately controlled (3, 4). While the ADCT has been validated to some extent in the Chinese (5) and Japanese contexts (6) in addition to the original version in English, validation within the Dutch population is missing.

The Recap of atopic eczema questionnaire (RECAP), another instrument endorsed by the HOME initiative for assessing eczema control (1, 2), exhibits great similarity to the ADCT in terms of content domains (3, 4, 7–9). A Spanish study showed a high correlation between ADCT and RECAP total scores (Spearman's rho = 0.91) (10). Nonetheless, further comparative studies are needed to better understand the distinctions and similarities between these 2 instruments, thereby aiding researchers and clinicians in making more informed choices in tool selection. Thus, in the present study, we aimed to assess measurement properties of the Dutch ADCT in adults with AD and compare it with RECAP.

MATERIALS AND METHODS

Study population and design

We conducted a prospective study following the guidelines by the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) group (11, 12). Adults (≥18 years) with AD, diagnosed by dermatologists according to the UK Working Party Criteria (13), were eligible to participate in this study, independent of disease severity and treatment. Participants were recruited from the outpatient clinic of the Department of Dermatology at the University Medical Center Groningen (UMCG), a tertiary referral centre for eczema in the Netherlands, between June 2021 and December 2022. Adults with AD were instructed to complete a series of questionnaires, including reference instruments, the ADCT and the RECAP, at 3 time points (T_0: baseline; T_1: after 1–3 days; T_2: after 4–12 weeks). Clinical severity was assessed by dermatologists at baseline using the Eczema Area and Severity Index (EASI) (14, 15) and the validated Investigator Global Assessment for Atopic Dermatitis (vIGA-AD) (16). More details on the reference instruments and clinical assessments are summarized in **Table I**.

This study was exempt from the Dutch Medical Research Involving Human Subjects Act according to the institutional review board of UMCG (reference: METc 202000915). All patients provided written informed consent.

Anchors

Patient Global Assessment (PtGA) of AD control. Patients were asked the following question in Dutch: "What is your overall impression of your atopic dermatitis control over the last week?" with response options: not at all, a little, moderately, mostly, and completely controlled (3).

Global Rating of Change (GRC) scale. This scale included 3 consecutive questions. First, patients were asked: "Overall, has there been any change in the level of disease control of your atopic dermatitis since the last time you completed the RECAP?" with response options: yes/no. Patients who answered "yes" were then asked 2 additional questions. The first question determined the direction and extent of change: "To what extent has the disease control of your atopic dermatitis changed?", with response options: much improvement, moderate improvement, minor improvement, minor deterioration, moderate deterioration, and much deterioration. The second question assessed the importance of the change: "Was this change (improvement/deterioration) important to you?" Finally, these questions resulted in 7 categories: no important change, important improvement (much/moderate/minor), and important deterioration (minor/moderate/much).

Statistical analysis

For all analyses, cases with missing values were excluded. SPSS Statistics for Macbook (V29.0; IBM Corp, Armonk, NY, USA) was used for all analyses.

Construct validity: single-score validity and responsiveness

We used hypothesis testing to assess the construct validity of the ADCT, with *a priori* hypotheses formulated as indicated in **Tables II** and **III**. Correlations between the ADCT and reference instruments were assessed regarding single scores (T_0) and change scores (T_2) using Spearman's rho (r). For change-score validity, a correlation difference of ≥0.1 was considered relevant (17). Additionally, we tested whether correlations on change-scores between the ADCT and reference instruments that measure similar constructs were ≥0.5, and those that measure related but dissimilar constructs were between 0.3 and 0.5 (17). Overall, high, moderate, and poor validity were identified if <25%, 25–50%, and >50% of hypotheses were rejected, respectively. A sample size of ≥70 (item/subject ratio of 1:10) was considered necessary for assessing construct validity (18).

Reliability

For assessing test–retest reliability, intra-class correlation coefficient ($ICC_{agreement}$) and measurement error were determined in unchanged patients between T_0 and T_1 based on the GRC scale (19). The $ICC_{agreement}$ was calculated, using a two-way mixed effects model for absolute agreement, with an $ICC_{agreement}$ value of >0.70 indicating acceptable reliability. Measurement error was reported with standard error of measurement ($SEM_{agreement}$). A sample size of ≥50 unchanged patients was seen as adequate for reliability (11).

Interpretability

For single scores, an anchor-based method was used to determine

Table I. Reference instruments used in current study

Factor	Measure name	Time points	Content and construct measured	Interpretability
Completed by participants	RECAP(7)	T_0, T_1, T_2	7 items related to eczema control in the past week	0–28: higher score indicating less control
	PtGA of AD control	T_0, T_1, T_2	Single item on eczema control in the past week	Not at all/a little/moderately/mostly/completely controlled
	POEM(25)	T_0, T_2	7 items on AD-specific symptoms and signs in the past week	0–28: higher score indicating greater severity
	PtGA of AD severity(26)	T_0, T_2	Single item on eczema severity in the past week	Clear, mild, moderate, severe, very severe
	DLQI(27)	T_0, T_2	10 items related to impairment on quality of life due to skin conditions in the past week	0–30: higher score representing greater impairment on HRQoL
	Skindex-29(28)	T_0, T_2	29 items on impairment on quality of life caused by skin conditions in the past 4 weeks	0–100: higher score indicating greater impairment on HRQoL
	EQ-5D-5L(29)	T_0, T_2	6 items regarding impairment on generic HRQoL	Value score: −0.59 to 1, with 1 indicating the best possible health state VAS score: 0–100, with 100 representing the best
	NRS for itch(30)	T_0, T_2	Single item on the worst itch in the past 24 h	0–10, with 10 being the worst severity
	NRS for sleep disturbance	T_0, T_2	Single item on the eczema-related sleep disturbance during the last night	0–10, with 10 being the worst sleep disturbance
	GRC scale	T_1, T_2	The degree of changes in AD control between 2 time points, using 3 consecutive questions	No important change, important improvement (much/moderate/minor), important deterioration (much/moderate/minor)
Completed by physicians	EASI(14)	T_0	Area and severity of clinical signs related to AD	0–72: higher score indicating more severe AD
	vIGA(16)	T_0	A single scale assessing AD severity based on morphological descriptions	From 0 (clear) to 4 (severe)

RECAP: Recap of atopic eczema; PtGA: Patient's Global Assessment; AD: atopic dermatitis; POEM: Patient-Oriented Eczema Measure; DLQI: Dermatology Life Quality Index; EQ-5D-5L: quality-of-life questionnaire of the EuroQol Group; VAS: visual analogue scale; NRS: numeric rating scale; GRC: Global Rating of Change; EASI: Eczema Area and Severity Index; vIGA: validated Investigator Global Assessment; HRQoL: health-related quality of life.
The original publications of the reference instruments were cited.

Table II. Single-score validity (at T0) correlations between the Atopic Dermatitis Control Tool (ADCT) and reference instruments

Reference instruments	Correlation hypothesized[a]	Correlation found	R^2	Hypotheses confirmed?
EASI ($n=184$)	++	0.64	0.34	Yes
vIGA ($n=175$)	++	0.65	0.37	Yes
PtGA of AD severity ($n=195$)	+++	0.83	0.69	Yes
PtGA of AD control ($n=195$)	+++	−0.78[b]	0.57	Yes
POEM ($n=196$)	+++	0.87	0.73	Yes
DLQI ($n=196$)	+++	0.89	0.81	Yes
Skindex-29 ($n=195$)	+++	0.88	0.78	Yes
EQ-5D-5L (Value score) ($n=194$)	+	−0.64[b]	0.44	No
EQ-5D-5L (VAS score) ($n=194$)	+	−0.51[b]	0.30	No
NRS peak itch ($n=188$)	+++	0.86	0.71	Yes
NRS sleep disturbance ($n=195$)	+++	0.77	0.67	Yes
Total amount of hypotheses that were confirmed		9/11 (82%)		

ADCT: Atopic Dermatitis Control Tool; EASI: Eczema Area and Severity Index; vIGA: validated Investigator Global Assessment; PtGA: Patient's Global Assessment; AD: atopic dermatitis; POEM: Patient-Oriented Eczema Measure; DLQI: Dermatology Life Quality Index; EQ-5D-5L: quality-of-life questionnaire of the EuroQol Group; VAS: visual analogue scale; NRS: numeric rating scale.
[a]Strong correlation (+++) is defined as $r>0.7$; moderate correlation (++) as $0.4<r<0.7$; and weak correlation (+) as $0.2<r<0.4$, using Spearman's rho (r). [b]Negative value owing to both the PtGA of AD control and EQ-5D-5L being scored inversely to the ADCT.

cut-off values of the ADCT, based on the level of agreement (linear weighted kappa) between ADCT scores and the anchor PtGA of AD control at T_0. Additionally, sensitivity analyses were performed to examine whether the distribution of age and sex differed significantly between patients falling within and outside the proposed banding.

The smallest detectable change (SDC) was determined in unchanged patients at T_1 using the formula: $SDC = 1.96 \times \sqrt{2} \times SEM_{agreement}$. The minimally important change (MIC) was determined in patients who reported important improvement at T_2 according to the GRC scale. MIC values were not assessed for deterioration due to a small size of 16 patients. Four methods were employed for assessing the MIC values, including the mean change method, 95% upper limit, receiver operating characteristics (ROC), and predictive modelling (20). Notably, considering that the prevalence of important improvement was 37.5% in this study, not equal to 50%, the MIC value based on predictive modelling was adjusted (21). More details on these 4 methods can be found in our previous studies (8, 9). A sample size of ≥100 patients with ≥50 reporting important improvement was deemed adequate for interpretability.

Floor and ceiling effects

Floor or ceiling effects were considered present if over 15% of patients had the highest or lowest ADCT scores (22).

Comparative analyses between RECAP and ADCT

This included 2 main parts: (*i*) Assessing correlations between these 2 instruments at the total score level, and the individual item level, using Spearman's rho (r); (*ii*) Examining the overlap of patients who were categorized into the same group based on the proposed banding of both instruments.

RESULTS

Study population

A total of 196 adult patients were included in the T_0 analyses (**Fig. 1**). Of those, 57.1% were males, with a mean age of 38.6 years (Table SI). In total, 54.4% of patients had moderate-to-severe AD based on the EASI scores. In addition, the follow-up rates were 89.8% ($n=176$) at T_1 and 92.9% ($n=182$) at T_2, respectively.

Table III. Responsiveness between T_0 and T_2

Factor	Correlations found	Hypotheses confirmed?
Hypothesis on correlations[a]		
Change ADCT – Change PtGA of AD control vs the following:	−0.68[b] vs. −0.61[b]	No
Change PtGA of AD severity – Change PtGA of AD control	−0.68[b] vs. −0.64[b]	No
Change POEM – Change PtGA of AD control	−0.68[b] vs. −0.61[b]	No
Change DLQI – Change PtGA of AD control	−0.68[b] vs. −0.61[b]	No
Change Skindex-29 – Change PtGA of AD control	−0.68[b] vs. 0.40	Yes
Change EQ-5D value – Change PtGA of AD control	−0.68[b] vs. 0.43	Yes
Change EQ-5D VAS – Change PtGA of AD control	−0.68[b] vs. −0.60[b]	No
Change NRS peak itch – Change PtGA of AD control	−0.68[b] vs. −0.53[b]	Yes
Change NRS sleep disturbances – Change PtGA of AD control		
Hypothesis according to COSMIN		
Instruments measuring similar constructs (≥0.50)	−0.68[b]	Yes
Change ADCT – Change PtGA of AD control	0.71	Yes
Change ADCT – Change PtGA of AD severity	0.67	Yes
Change ADCT – Change POEM	0.70	Yes
Change ADCT – Change NRS peak itch	0.65	Yes
Change ADCT – Change NRS sleep disturbance		
Instruments measuring related, but dissimilar constructs (0.30–0.50)	0.72	No
Change ADCT – Change Skindex-29	−0.50[c]	Yes
Change ADCT – Change EQ-5D value	−0.42[c]	Yes
Change ADCT – Change EQ-5D VAS	0.75	No
Change ADCT – Change DLQI		
Total number of hypotheses that were confirmed	10/17 (59%)	

ADCT: Atopic Dermatitis Control Tool; PtGA: Patient's Global Assessment; AD: atopic dermatitis; POEM: Patient-Oriented Eczema Measure; DLQI: Dermatology Life Quality Index; EQ-5D-5L: quality-of-life questionnaire of the EuroQol Group; VAS: visual analogue scale; NRS: numeric rating scale.
[a]A correlation difference of ≥0.1 was deemed relevant and thus hypothesis confirmed. [b]Negative value owing to the PtGA of AD control being scored inversely to the ADCT and other reference instruments except EQ-5D-5L. [c]Negative value owing to the EQ-5D-5L being scored inversely to the ADCT.

Construct validity

Single-score and change-score validity. Regarding single-score validity, 82% of the *a priori* stated hypotheses were confirmed, indicating a high single-score validity of the Dutch ADCT (Table II). The observed correlations for the rejected hypotheses were higher than anticipated. With regard to responsiveness, 59% of the prior hypotheses were confirmed, suggesting a moderate responsiveness (Table III).

Known group validity. Known group analyses showed that patients with more severe disease had higher ADCT total scores, indicating poorer eczema control. Likewise, those who reported greater impairment in quality of life exhibited higher ADCT scores. The difference in ADCT total scores across groups was statistically significant (Fig. S1).

Reliability

Patients who completed the T_1 questionnaires within 3 days and reported no change on the GRC scale at T_1, were included in the test–retest reliability analyses ($n = 110$). The $ICC_{agreement}$ was 0.983 (95% confidence interval [CI)] 0.975–988), indicating excellent reliability. The $SEM_{agreement}$ was 1.15 points.

Interpretability

Single scores. A significant and high correlation was observed between ADCT total scores and the anchor PtGA of disease control (Spearman's rho = –0.78, $p < 0.001$) (Fig. S2). For individual ADCT scores, a total of 54 banding options were tested (Tables SII and SIII). The banding: 0–1 (completely controlled), 2–3 (mostly controlled), 4–9 (moderately controlled), 10–14 (a little controlled), and 15–24 (not at all controlled), had the highest kappa coefficient of agreement of 0.616. Additionally, the second highest kappa coefficient of agreement was only 0.002 lower than the highest one, and the corresponding banding was: 0–1 (completely controlled), 2–5 (mostly controlled), 6–9 (moderately controlled), 10–14 (a little controlled), and 15–24 (not at all controlled). Taking previous validation studies into account (3, 4), a binary cutoff of ≥6 was determined to identify patients with inadequate AD control, according to the latter banding option reported above. "Not under control" included "not

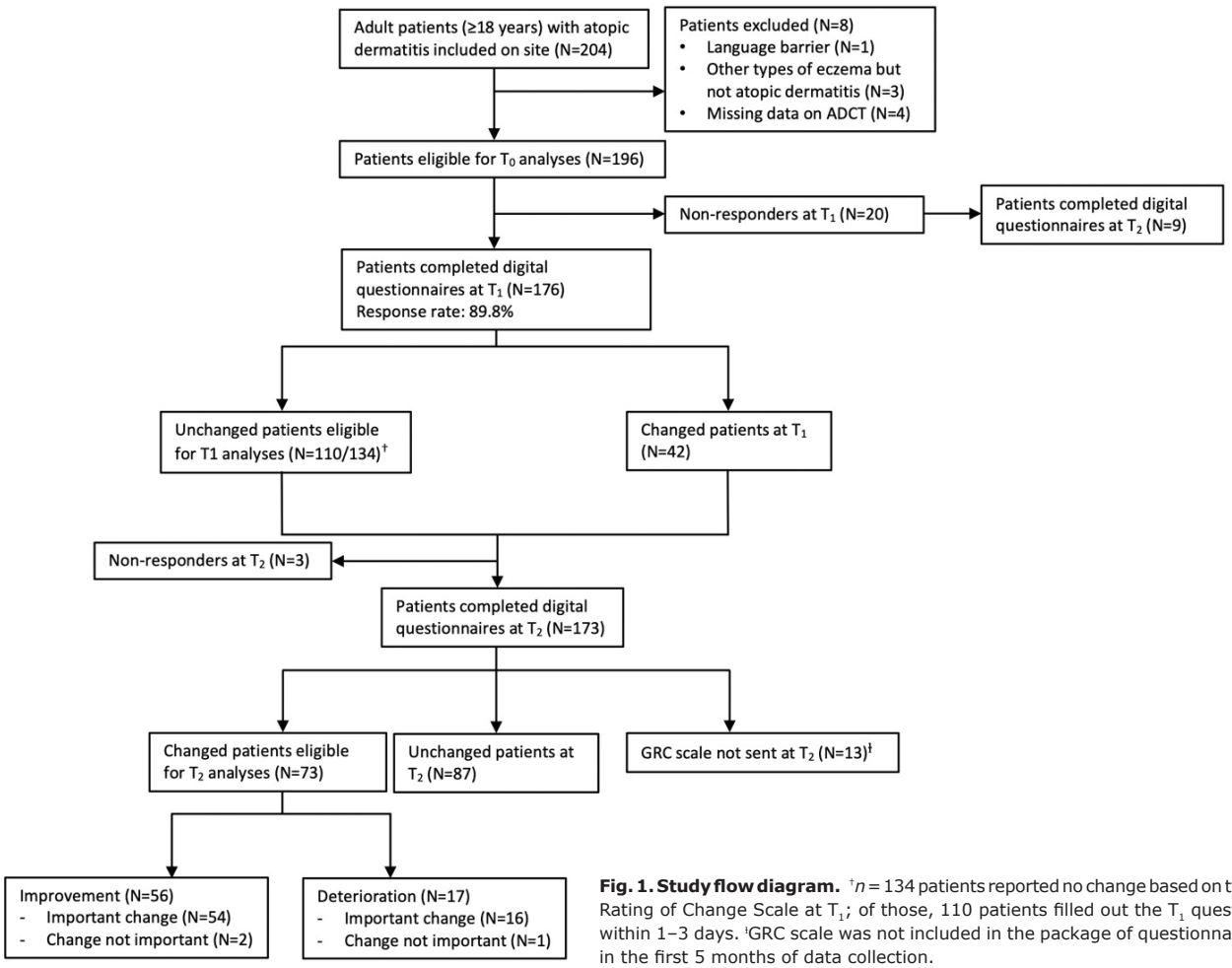

Fig. 1. Study flow diagram. †$n = 134$ patients reported no change based on the Global Rating of Change Scale at T_1; of those, 110 patients filled out the T_1 questionnaire within 1–3 days. ‡GRC scale was not included in the package of questionnaires at T_2 in the first 5 months of data collection.

at all controlled", "a little controlled", and "moderately controlled".

Overview of ADCT scores falling outside the proposed banding. Two patients (1.0%) had PtGA of AD control scores that were more than 2 groups less controlled than the proposed banding would have predicted. In total 8 patients (4.1%) and 11 patients (5.6%) had PtGA of AD control score that were 2 groups less or more controlled than the proposed banding would have predicted, respectively. Additionally, no significant differences in the distribution of age ($p=0.818$) and sex ($p=0.112$) were observed between the patients falling within and outside the proposed banding (Table SIV).

Change scores. The SDC was 3.2 points. For change scores, the correlation between ADCT change scores and the GRC scale at T_2 was –0.617, indicating the GRC scale as an appropriate anchor (23). The MIC values obtained by applying 4 different methods were 3.5 for the mean change (Table SV), 5.5 for the 95% upper limit cut-off point, 2.5 for the ROC (Table SVI, Fig. S3), and 2.9 for the predictive modelling after adjustment.

Floor and ceiling effect

No floor or ceiling effects were observed.

Comparative analysis between ADCT and RECAP

Correlation between ADCT and RECAP scores. ADCT total scores exhibited a strong correlation with RECAP total scores, with a Spearman's rho exceeding 0.90 at all 3 time points. In addition, high correlations were observed between change scores on ADCT and RECAP between T_0 and T_2, as well as between T_1 and T_2, while the correlation strength between T_0 and T_1 was 0.50 (Table SVII, Figs S4, S5). Moreover, high correlations were noted between corresponding individual items from ADCT and RECAP, with a minimum strength of 0.74. Additionally, the extra item on itch from the RECAP showed moderate correlations with all items from ADCT at all time points (Spearman's rho range: 0.47–0.69), except its high correlation with the first item of the ADCT on overall eczema-related symptoms at baseline (Spearman's rho = 0.72) (Table SVIII).

Overview of ADCT scores falling outside the banding of RECAP scores. Upon comparison with the proposed RECAP bandings from our previous study (8), 70.9% of patients ($n=139/196$) were classified into the same group based on the proposed ADCT bandings. In total, 41 patients (20.9%) and 14 patients (7.1%) who had an ADCT score 1 point lower and higher, respectively, than the RECAP banding would have been predicted. Additionally, 2 patients (1.0%) had an ADCT score 2 points lower or higher than anticipated by the RECAP banding. No patient exhibited a difference of > 2 points (Table SIX). Male patients were more likely to fall outside the proposed banding ($p<0.001$), whereas no significant difference was noted among age groups between the patients falling within and outside the proposed banding.

DISCUSSION

Main finding

In the current study, the ADCT exhibited good single-score construct validity and known group validity, moderate responsiveness, and excellent test–retest reliability among Dutch adult patients. Proposed bands for ADCT scores were established: 0–1 (completely controlled), 2–5 (mostly controlled), 6–9 (moderately controlled), 10–14 (a little controlled), and 15–24 (not at all controlled), with a binary cut-off of ADCT ≥6 being set to identify patients with inadequately controlled AD. Additionally, an improvement of ≥4 points on the ADCT total scores was deemed clinically relevant. Moreover, comparative analyses revealed a high similarity between the ADCT and RECAP both at the total score level and individual item level. Also, 71% of patients were classified into the same groups regarding eczema control based on the proposed ADCT and RECAP bandings.

Validation of the ADCT in Dutch adults

Our findings of good single-score validity, known group validity, and reliability are in line with a previous validation report from the RELIEVE-AD study in a US population of AD patients (4). In addition to validity in single scores, it is crucial for an instrument to be able to capture changes over time in the construct to be assessed, namely responsiveness. In the present study we found moderate responsiveness for the Dutch ADCT, which was confirmed in the initial validation study, although assessed using a different methodology and set of reference instruments (4).

Regarding the interpretability of ADCT single scores, we proposed banding of scores alongside a binary cutoff point for poor control. However, it should be mentioned that the binary cut-off should preferably be used in conjunction with the category bandings and the MIC when drawing conclusions concerning (changes in) the disease state of a patient. The distinction between different states of disease control is crucial for the decision-making progress regarding treatment and monitoring of patients. Our proposed ADCT banding option could help assess self-perceived disease state of AD in clinical and research settings and assist in the communication between patient and healthcare professionals (6). The binary cut-off for disease control previously suggested by Pariser et al. (3) was ≥7 points. However, it was assessed using only the ROC method in patients treated with dupilumab and is thus only somewhat comparable to the methodology

employed here (3). Important to note is that we found 3 banding options with relatively similar kappa coefficients of agreement on the upper end of the spectrum (highlight in Table S3) that solely differed in the cutoff value between "mostly controlled" and "moderately controlled", which is simultaneously considered the threshold for the binary cutoff of overall disease control. Therefore, the proposed banding option was determined based on the kappa coefficient of agreement, in combination with this previous report (3) and the implications for clinical interpretability.

MIC values were determined using 4 different methods, which produced varying results, ranging from 2.5–5.5 points. Of the 4 MIC estimates, the predictive MIC (after adjustment) may be the most accurate (20). Previously, a MIC of ≥5 points had been proposed based on the anchor-based method, using a 1-level improvement of PtGA of disease control or DLQI as reference (4). However, this 1-level improvement does not necessarily reflect a meaningful change from the patient's perspective. Ultimately, considering the SDC of 3.2, we concluded that an improvement of ≥4 points would be deemed clinically relevant.

Comparison between ADCT and RECAP

Because the ADCT and RECAP are measuring similar constructs regarding AD control (1, 2), we aimed to specifically elicit the similarities and discrepancies between these 2 PROMs. As expected, total scores of both instruments showed a strong correlation when compared cross-sectionally. Change scores of ADCT and RECAP showed high correlations between T_0 and T_2, as well as T_1 and T_2, but only moderate correlation between T_0 and T_1. This might be explained by the small variance in the ADCT change scores between T_0 and T_1, which mostly ranged between –3 and 3 points. When restricting the analysis to patients who had ADCT change scores between –3 and 3 points between T_0 and T_1, the Spearman rho was 0.72. Further, similarities between the items of both instruments allowed for the analysis of individual item correlations. Those items with comparable content observed high correlations with the respective item of the other instrument. One item of the RECAP, assessing itch, was not reflected directly by any of the items in the ADCT, suggesting it might add additional value by holistically capturing patient-perceived eczema control considering the importance of itch in a patient's disease journey.

Overall, both instruments display great similarity in total scores, individual items, and their tested measurement properties among adults. In the study by Oosterhaven et al. (24), a stand-alone question was used to ask patients about their preference between the ADCT and RECAP, in which 80% indicated no preference, while 11% preferred the ADCT and 9% RECAP. These findings make it challenging to recommend 1 instrument over the other for measuring eczema control in adults. However, recommending a single, standardized instrument would improve the comparability of future research, as multiple instruments can decrease comparability. Future studies, including qualitative research focusing on patient and clinician preferences, could be beneficial to help HOME select a single instrument to measure eczema control for the core outcome set for AD. Regarding the child population, the lack of validation studies for the ADCT in children suggests that RECAP may currently be the more appropriate for this group.

Strengths and limitations

We employed rigorous methods to assess various measurement properties of the ADCT, following the COSMIN guidelines (11, 12). This is the first validation study on the Dutch ADCT and we additionally provide comprehensive comparative analyses between the ADCT and RECAP across various aspects. However, the generalizability of our results might be a concern, considering that only Dutch adult patients were included in this study. Future studies conducted in children and other language settings are needed. In addition, MIC values were assessed only for improvement, but not deterioration, due to the small sample size of the deteriorated group ($n = 16$). Lastly, the anchors used, including PtGA of AD control and GRC scale, are not validated.

Conclusion

The Dutch ADCT demonstrates good single-score validity, moderate responsiveness, good known group validity, and excellent reliability, with a threshold of ≥6 indicating uncontrolled AD. An improvement of ≥4 points is considered clinically important. These findings support the use of ADCT as a valid and reliable tool for assessing eczema control. Moreover, our comprehensive comparative analyses highlight a high similarity between ADCT and RECAP across various aspects. Future qualitative research on patient and clinician preferences would be beneficial for HOME to recommend 1 instrument over the other for standardized use.

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Data availability: The data underlying this article will be shared on reasonable request to the corresponding authors.

Ethics statement: This research was reviewed and approved by the Medical Ethical Review Board of the University Medical Center Groningen (reference: METc 202000915).

Patient consent on file: All patients provided written informed consent.

Conflicts of interest: MLAS is an adviser, consultant, speaker and/or investigator for AbbVie, Pfizer, LEO Pharma, Regeneron, Sanofi Genzyme, Eli Lilly, Galderma, and Amgen. She has received grants from Regeneron, Sanofi Genzyme, and Pfizer. JAFO is an investigator for ICON. Others report no conflict of interest.

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