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REVIEW ARTICLE

# Treat-to-target in dermatology: A scoping review and International Eczema Council survey on the approach in atopic dermatitis

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## Abstract

Treat-to-target (T2T) is a pragmatic therapeutic strategy being gradually introduced into dermatology after adoption in several other clinical areas. Atopic dermatitis (AD), one of the most common inflammatory skin diseases, may also benefit from this structured and practical therapeutic approach. We aimed to evaluate existing data regarding the T2T approach in dermatology, with a specific focus on AD, as well as the views of International Eczema Council (IEC) members on the potential application of a T2T approach to AD management. To do so, we systematically searched for peer-reviewed publications on the T2T approach for any skin disease in the PubMed and Scopus databases

up to February 2022 and conducted a survey among IEC members regarding various components to potentially include in a T2T approach in AD. We identified 21 relevant T2T-related reports in dermatology, of which 14 were related to psoriasis, five to AD, one for juvenile dermatomyositis and one for urticaria. In the IEC member survey, respondents proposed treatable traits (with itch, disease severity and sleep problems getting the highest scores), relevant comorbidities (with asthma being selected most commonly, followed by anxiety and depression in adults), recommended specialists that should define the approach in AD (dermatologists, allergists and primary care physicians were most commonly selected in adults), and applicable assessment tools (both physician- and patient-reported), in both adult and paediatric patients, for potential future utilization of the T2T approach in AD. In conclusion, while the T2T approach may become a useful tool to simplify therapeutic goals and AD management, its foundation in AD is only starting to build. A multidisciplinary approach, including a wide range of stakeholders, including patients, is needed to further define the essential components needed to utilize T2T in AD.

## INTRODUCTION

The treat-to-target (T2T) approach was first introduced in internal medicine for diseases such as diabetes, hypertension and rheumatoid arthritis (RA), and has since improved disease management and therapeutic outcomes.[1,2] T2T has recently gained interest in multiple clinical fields, with over 200 yearly publications identified on PubMed for 'treat-to-target' (January 2018–February 2023). This pragmatic therapeutic strategy could be defined as: 'choosing a well-defined, relevant target, taking therapeutic steps, evaluating whether the target has been achieved, and taking action if it has not'.[3] Importantly, T2T was superior to standard treatment at improving patient outcomes in several randomized controlled studies.[4–6] In RA, it led to higher rates of low disease activity and remission compared with a non-T2T strategy.[5] While T2T-related treatment targets are established in non-dermatological diseases with the goal of reducing the risk of end-organ damage,[7,8] targets will be different for most dermatological diseases.

Atopic dermatitis (AD) is characterized by chronic eczematous eruptions with flares, significant pruritus and profound impact on quality of life.[9–11] Although the visibility of clinical signs can be used to define the severity of skin diseases, clinician-determined severity may not reflect the impact of the disease on patients' quality of life.[12,13] Moreover, evaluation of therapeutic success relying merely on skin examination may unsatisfactorily address patient-related needs and symptoms,[14] with potentially significant discordance between patients and physicians in disease severity assessments,[15,16] especially in patients with depression and anxiety.[17]

Treat-to-target may be particularly meaningful in AD, which represents therapeutic challenges due to heterogeneity in clinical expression and the importance of symptoms such as pruritus.[18–20] Recently, the National Institute for Health and Care Excellence (NICE) in the UK has fully adopted a T2T approach for AD treatments, allowing the continuation of novel systemic therapy trials only if a decrease in Eczema Area and Severity Index (EASI) and Dermatology Life Quality Index (DLQI) is reached.[21]

To evaluate existing data regarding the T2T approach in dermatology, with a specific focus on AD, along with International Eczema Council (IEC) counsellors' and associates' views on the potential application of a T2T approach to AD management, we conducted a scoping review and surveyed IEC members about the T2T approach and how it might be implemented in AD. An AD patient with extensive expertise in the field participated to provide patients' perspectives.

## METHODS

### Scoping review

This scoping review took place between 20 February and 1 April 2022 (Figure 1). We searched PubMed and Scopus using the terms 'dermatology' or 'atopic dermatitis' or 'atopic eczema' and 'treat-to-target' or 'T2T'; only reports in English were included. We included studies that examined aspects related to a T2T approach for any skin disease in dermatology. We report the review according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews guidelines (Table S1). Two independent authors (YRY and EDD) screened titles, abstracts and full text for inclusion, and extracted the data.

Data extracted included study title/authors/year/journal, and all aspects of the T2T approach in the respective dermatological disease in the report. A written protocol was not used. The data was summarized in the text and Table S2.

### Survey

The IEC consists of more than 100 members (https://www.eczemacouncil.org/) from various countries, all experts in AD. This survey was conducted online between August 16th and September 22nd, 2021, using SurveyMonkey. Survey

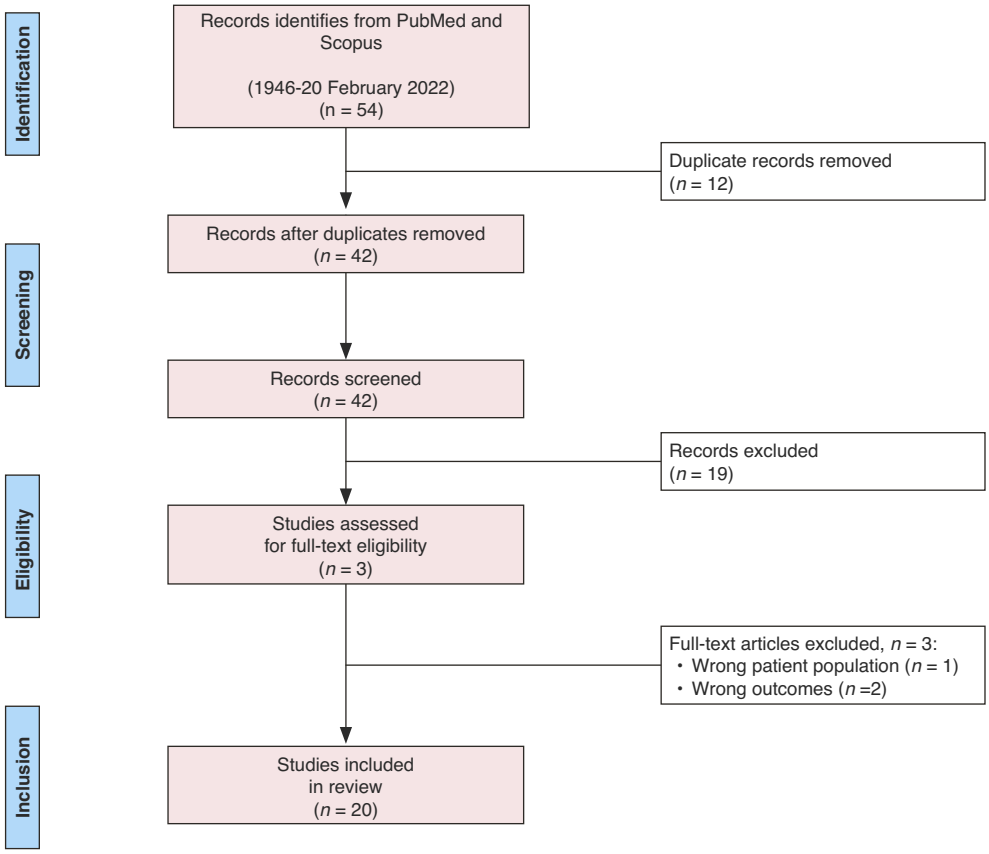


**FIGURE 1** PRISMA chart for the systematic scoping review.

items were determined during roundtable consensus discussions by IEC members. An invitation to an internet-based survey was sent by email to all IEC councillors and associates to examine their opinion regarding T2T-related aspects in AD, with an additional two emails sent as a reminder. The survey included items that could potentially be included in a future T2T approach paradigm in AD, such as relevant comorbidities, potentially treatable traits and therapeutic outcomes using variable disease severity scores, encompassing both clinician- and patient-reported outcomes (full survey available in the supplemetary materials).

# RESULTS

## Systematic scoping review of the T2T approach in dermatology

Of 54 references found using the search terms, 21 relevant T2T-related reports in dermatology were included (Figure 1). Fourteen studies related to psoriasis,[17,22–34] five to AD,[35–39] one for juvenile dermatomyositis[40] and one for urticaria.[41] The predominant article type encompassed within the collection was the consensus paper (7/21) (Table S2).

In psoriasis, relevant studies included reports of various expert forums defining treatment goals,[25,26,28,32,34] as well as clinical trials utilizing the T2T approach.[27,31] Psoriasis treatment targets included thresholds for Psoriasis Area and Severity Index (PASI), Patient Global Assessment (PGA), itch and DLQI,[24–26,28,32,34] among other therapeutic outcomes. Some reports present complex therapeutic algorithms utilizing PASI,[24] which is the gold standard assessment for psoriasis, while others use the 5-point Investigator Global Assessment (IGA), especially with Body Surface Area (BSA), which is a faster, practical proxy measure, shown to be highly correlated with PASI90 and DLQI.[22,23,30] Many psoriasis reports agreed on a key timepoint for disease reassessment at 3–6 months following treatment initiation.[25,26,28,32,34]

Atopic dermatitis T2T-related studies were sparse. A Japanese consensus statement from Arakawa et al. on paediatric AD treatment goals divided therapeutic goals into short/medium-term and long-term.[39] The statement suggests that these temporal concepts will also be explained to patients and that treatment targets should be associated with primary evaluation domains of the Harmonizing Outcome Measures for Eczema (HOME) core outcome set.[42] Attainment goals were divided by AD signs and symptoms in the short-term: completely controlled or mild AD by drug therapy and suppressed itch, versus long-term targets: no quality of life impairment and disease control using topical skin care alone.[39]

A discussion paper by the European Task Force on Atopic Dermatitis (ETFAD) suggested the potential use of traits in

AD, following the concept utilized in asthma, and defined by being measurable and treatable.[38] It was suggested that various AD domains (divided by cutaneous, extra-cutaneous and psychological/occupational) could be assessed and affect treatment targets, and it was emphasized that due to the complexity of AD, the T2T approach in AD management requires targeting the needs of an individual rather than a group and that these needs could be heterogenous and multiple.[38]

Lastly, an international industry-funded study and an Italian study both used an eDelphi process to define specific treatment goals, or targets, in AD.[35,36] These were determined for outcomes at 3- and 6-months following treatment initiation. While the international study suggested to assess therapeutic goals by dividing them into 'patient global' (using Patient self-reported Global Assessment of disease severity [PtGA]) and 'disease domains' (including EASI/SCORing AD [SCORAD]/peak pruritus Numeric Rating Scale [NRS]/ DLQI/ Patient-Oriented Eczema Measure [POEM]),[35] the Italian experts divided therapeutic targets into 'disease measure' (EASI and a pruritus NRS response) versus 'impact on patient' (measured using the DLQI and Atopic Dermatitis Control Tool [ADCT]) in another AD-related report.[36]

## Survey responder's characteristics

Fifty-nine of 112 (52.7%) IEC members responded to the survey. Respondents came from 19 countries: United States ($n = 18$), Germany and the United Kingdom ($n = 6$ from each), Canada and France ($n = 4$ from each), Brazil, Denmark, Israel, Korea, The Netherlands, South Africa and Spain ($n = 2$ from each) and Austria, India, Ireland, Italy, Japan, Singapore and Taiwan ($n = 1$ from each).

Respondents practised primarily in academic institutions and/or hospitals (79.7% and 40.0%, respectively), and a total of 13.6% and 35.6% of respondents reported seeing primarily paediatric and adult patients with AD, respectively. The rest reported treating AD in all age groups (50.8%).

## Survey results: stakeholders

Respondents were first asked which stakeholders should be involved in the process of T2T approach planning in AD and were able to choose multiple stakeholders. Physicians and patients were selected most commonly, with lower priority given to payers, other medical professionals and pharmaceutical companies (Figure 2).

Respondents suggested that dermatologists should be the primary medical speciality defining AD treatment targets in adults, in addition to allergists and primary care physicians (Figure 3). Among North American respondents (US and Canada), 77.3% supported the inclusion of allergists, versus only 43.2% of respondents from South America, Africa, Europe and Asia. In contrast, fewer North American respondents supported the inclusion of primary care physicians

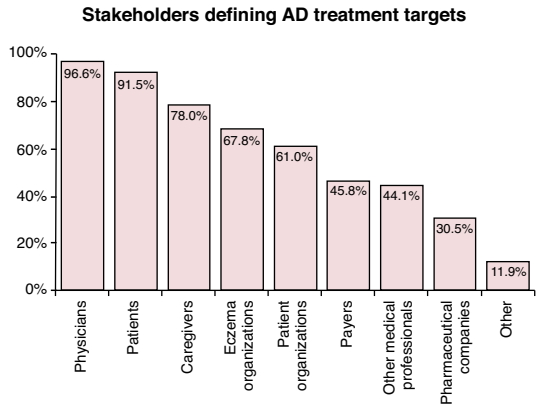


**FIGURE 2** Respondents ($n = 59$) were asked which stakeholders should be involved in defining treatment targets as part of the development of the treat-to-target approach in atopic dermatitis and were able to choose multiple stakeholders.

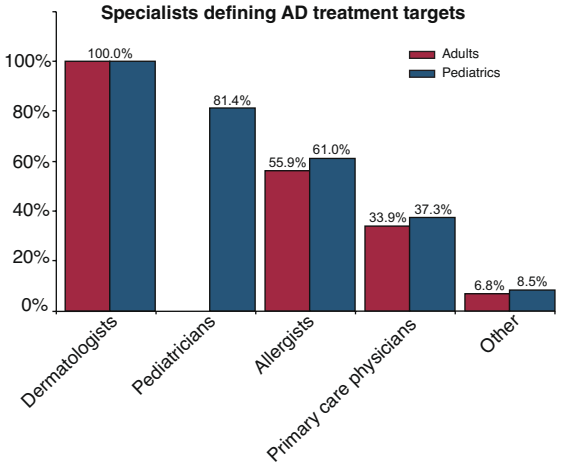


**FIGURE 3** Respondents ($n = 59$) were asked which medical specialities should be involved in the process of defining atopic dermatitis treatment targets in a treat-to-target approach in adult and paediatric (<18 years) patients. Number of selected specialties was not limited.

than respondents from other continents (27.2% vs. 37.8%, accordingly). When asked the same set of questions about paediatric patients, responders indicated similar results, with strong support for the inclusion of paediatricians in the process (overall - 81.4%) (Figure 3).

## Survey results: defining treatable traits

A treatable trait can be defined as a clinically relevant disease feature that is measurable and may improve with disease treatment, and it may include relevant comorbidities.[38] Establishing treatable traits is instrumental for the future implementation of the T2T approach in AD, and we sought to determine what are the top therapeutic targets in AD using our survey. Separate survey items were dedicated to adult and paediatric treatable traits, and results were largely

similar across these populations. The same traits were ranked among the top three in both adults and children: itch (98.3% in both), AD/eczema severity (86.4% and 70.6%, respectively), and sleep problems (64.4% and 87.3%, respectively). Other treatment traits included both patient-reported traits (e.g. quality of life, emotional well-being), along with traits that could be regarded as both patient-reported and clinician-assessed (e.g. flare frequency and location of lesions) (Figure 4).

We also surveyed regarding comorbidities that should be included as treatment targets in AD given the significant rates of atopic, mental health and skin comorbidities in AD. Across adult and paediatric patients, asthma was selected most commonly as an important treatment target (76.3%–87.9%), followed by anxiety and depression in adults (61.0%) and food allergies in children (69.5%). 13.6% of respondents felt comorbidities should not be included as treatment targets in AD (Figure 5).

## Survey results: clinician- and patient-reported outcomes

After agreeing that therapeutic outcomes should be determined by combining both patient-reported outcomes and clinician-reported outcomes (indicated by 93.1% of respondents), we asked what outcomes should be used to decide upon treatment targets in AD from a predefined list. Among clinician-reported outcomes proposed in the survey, EASI and SCORAD were selected as preferred scoring tools (28.8% and 25.42%, respectively), with IGA alone and a combination of BSA and IGA selected by 20.34% of the respondents. Thus, there was no broad consensus on a specific score. Moreover, results were largely dependent on respondents' continent: while only 13.6% of North American respondents selected EASI, 36.0% of European respondents preferred EASI. SCORAD was selected at similar rates across different geographic locations (22.7%–27.0%), and BSA/IGA was mostly selected by of North American respondents (Figure 6). Among proposed patient-reported outcomes, about third of respondents (32.3%) selected POEM, 17.0% selected DLQI, 11.9% selected PGA and ADCT, 10.2% and 8.5% selected mean NRS itch and worst NRS itch, respectively. These responses were similar across different continents.

When respondents were asked for the minimal level of improvement[43] they proposed as a treatment goal, EASI-75 was primarily selected (42.4%), followed by EASI-50 (39.0%) and EASI-90 (11.9%). None of the responders selected EASI-25 or EASI-100. Similar responses were recorded for minimal SCORAD improvement, with 46.8% and 44.1% of respondents selecting SCORAD-75 and SCORAD-50, respectively, and only 3.4% choosing SCORAD-25. When asked for absolute EASI (ranging from 0 to 72) targets

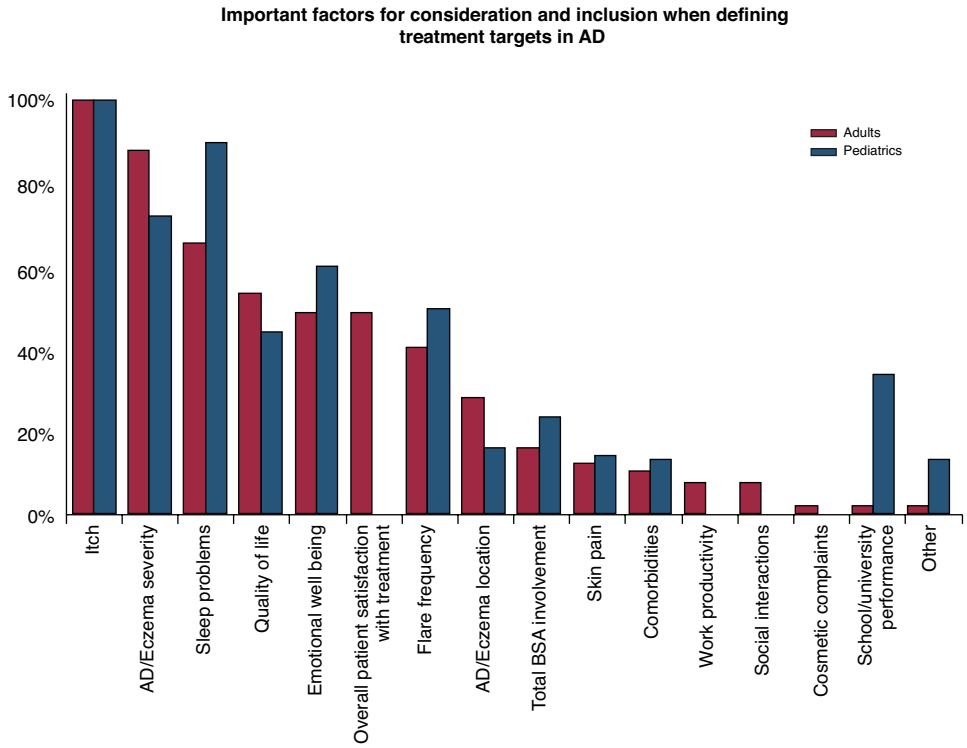


**FIGURE 4** Respondents ($n = 59$) were asked to choose the five most important aspects that should be included when treatment targets are defined for a treat-to-target approach in atopic dermatitis. BSA, body surface area.

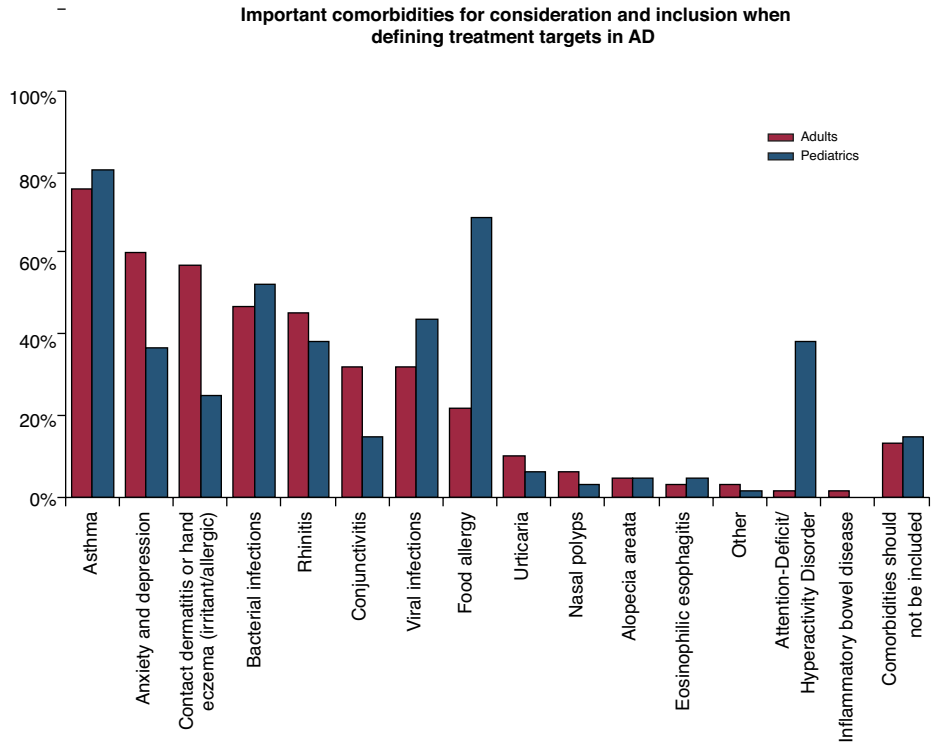


**FIGURE 5** Respondents ($n = 59$) were asked to choose the five most important comorbidities that should be included when treatment targets are defined for a treat-to-target approach in atopic dermatitis.

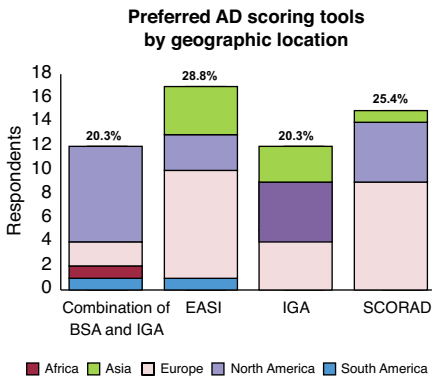


**FIGURE 6** Respondents ($n = 59$) were asked to choose the most important clinician-reported tool that should be included when treatment targets are defined for a treat-to-target approach in atopic dermatitis (AD). Only one tool could be selected. The option 'Other' was selected by 5.2% of all responders. BSA, body surface area; EASI, eczema area and severity index; IGA, investigator global assessment; SCORAD, SCOring AD.

for adults and children, over half of the respondents felt that a post-treatment EASI score of 2–4 was sufficient. 19.0% chose EASI = 0–2, 15.3% chose EASI = 5–8, and 8.5% chose EASI = 9–10. For SCORAD (ranging from 0 to 103), over 40% of responders selected SCORAD = 5–10 as an appropriate post-treatment target, 23.6% chose SCORAD = 10–20, 10.2% chose SCORAD = 0–4 and 6.8% chose SCORAD = 21–30 (reflecting mild-to-moderate AD).[44] For IGA (ranging from 0 to 5), 67.8% selected IGA-1 (almost clear), 15.3% selected IGA-2 (mild) and 11.9% selected IGA-0 (clear).

Next, respondents were asked about patient-reported outcomes. For PGA, survey results were identical to those of IGA. For items scored on a 1–10 NRS, including sleep problems, mean skin pain, mean itch, worst skin pain and worst itch, most responders selected a therapeutic endpoint of 1–2 as a treatment target, followed by 0, and 3 (Figure S1).

For the DLQI, ranging between 0 (no impact on patients' quality of life) to 30 (maximal impact), most respondents perceived a score of 0–2 as an appropriate therapeutic target (50.8%), while 39.0% and 3.4% selected DLQI scores of 3–6 and 7–10, respectively.

## DISCUSSION

In this scoping review and IEC survey, we assessed the current landscape of the T2T approach in dermatology thus far and obtained expert perspectives on how this approach could be developed for AD. A proposed roadmap integrating potential steps needed to establish a T2T approach in AD is presented in Figure S2.

We found only a few T2T-related studies in AD, with more studies related to psoriasis. While treatment goals are defined

by multiple expert forums to outline the T2T approach in psoriasis management, and there are already psoriasis clinical trials utilizing the T2T approach,[27,31] the foundation for this approach in AD is only starting to build. Despite the similarities between the diseases, psoriasis and AD present overt differences.[45] For example, AD is more heterogeneous and fluctuating, and the burden of AD also includes more complex treatable traits such as sleep loss or itch, while in psoriasis, a tight correlation is found between BSA and DLQI, suggesting that psoriasis extent is a main driver of quality of life impact in the disease. Thus, the symptomatic component of AD may be more important and multifaceted than in psoriasis and needs to be woven into future T2T outcomes.

Atopic dermatitis experts ranked asthma as a leading comorbidity and treatable trait in both children and adults. Allergic rhinitis was also ranked in the top five for both age groups. This is an important aspect of disease management, with relatively sparse literature. For example, patients with comorbid moderate-to-severe AD, asthma and/or chronic sino-nasal symptoms treated with dupilumab, improved all three diseases versus placebo.[46] Nevertheless, data regarding the magnitude of AD improvement correlated or predictive of asthma and/or sino-nasal symptoms improvements are lacking. Further investigation of the therapeutic outcomes in AD patients with atopic comorbidities is necessary to establish tailored treatment goals and strategies in this population.

Our survey assessed potential treatable traits in adult and paediatric populations separately, highlighting potential differences in treatment goals between these populations,[19] For example, 'sleep problems' received a higher rank in children, along with 'emotional well-being', reflecting the concerns of respondents regarding the mental consequences of AD in younger patients.[9,47] These results reinforce the need to include paediatric dermatologists and paediatricians in AD experts' discussions to improve the targeted modification of treatment goals and clinical guidelines in the paediatric population.

Ideally, symptom measurement instruments in AD should be evaluated based on their quality, utilizing assessments such as the Using the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) checklist.[48] Recently, the HOME initiative proposed instruments to measure AD in clinical practice, recommending the use of POEM, Patient-Oriented (PO)-SCORAD and peak pruritus NRS as tools for AD symptoms, along with ADCT/Recap of Atopic Eczema (RECAP) for disease control.[49,50] While our respondents ranked EASI, SCORAD and IGA similarly as a leading clinician-reported outcome in AD, it is important to note that these scores are highly correlated among them.[44] Additionally, EASI/SCORAD are not always practical during a routine patient visit, and thus other measures were proposed as rapid, simpler alternatives, such as IGA*BSA composite.[51,52] Next, most respondents selected EASI-75/50 and SCORAD-75/50 as AD therapeutic targets, reflecting the clinical efficacy and realistic treatment outcomes of available AD therapeutic options thus far.[53] These therapeutic outcomes were also reported as meaningful percentage MCIDs, regardless of baseline AD severity.[54] Of note, with the recent introduction of more therapeutic agents into the AD treatment arsenal,[55–57] therapeutic targets are more achievable than ever; this may also lead to therapeutic target shifting with higher expectations for improvement. Moreover, better disease management also includes maintaining the target and not only achieving targets, adding another layer of complexity for treating physicians, who need to clinically optimize the new AD treatments at hand.

Potential barriers for the determination and implementation of the T2T approach in AD include the significant challenge to define biologically relevant and patient-oriented treatment targets using current outcome measurement instruments (as demonstrated in our survey), the possible involvement of health systems which may ultimately dictate outcome measurements required for reimbursement, and the need to prove, using evidence-based tools, that T2T works better than the current approach. To partially resolve these drawbacks, a more flexible T2T approach or multiple available instruments could be proposed as part of a T2T therapeutic paradigm in AD. Another barrier is the challenge to regularly assess AD scores in an outpatient clinical setting, which requires skills, experience and time, as well as appropriate storage of these data in health records.

Our study has limitations. Our survey reflects the opinions of selected experts in the field of AD and does not attempt to determine final treatment target definitions in AD encompassing the views of a wider group of stakeholders (e.g. paediatricians, allergists) or patient organizations. While determination of the objectives needed to utilize the T2T approach is useful for clinical trials and pharma companies, it should primarily include parameters indicating improved patient-reported outcomes. This balance needs to be carefully considered when T2T goals for AD are crafted, and patients need to play a central role in the process.

In conclusion, the T2T approach may encourage physicians to better engage with their patients regarding their treatment goals and advance treatments in a timely manner. It may become a useful tool in AD and simplify therapeutic goals given the complexity of the clinical management of the disease. Determination of treatment targets can raise the expectation of physicians that better goals are achievable, prevent under-treatment and provide an outline for a shared discussion on patient's goals and expectations. We suggest further development of a T2T approach in AD would be best taken forward through structured engagement with a wide range of stakeholders including physicians, patients, caregivers, representative bodies, third-party payers, other medical professionals and pharmaceutical companies. Implementation of T2T in AD could require modification of current reimbursement models or development of a new, reimbursable, model of care that better meets patients' needs by demonstrating where and how value is added.

## ACKNOWLEDGEMENTS

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## CONFLICT OF INTEREST STATEMENT

JPT is an advisor for AbbVie, Almirall, Arena Pharmaceuticals, Coloplast, OM Pharma, Aslan Pharmaceuticals, Union Therapeutics, RAPT Therapeutics, Eli Lilly & Co, LEO Pharma, Pfizer, Regeneron and Sanofi-Genzyme, a speaker for AbbVie, Almirall, Eli Lilly & Co, LEO Pharma, Pfizer, Regeneron and Sanofi-Genzyme and received research grants from Pfizer, Regeneron and Sanofi-Genzyme. ADI has received an honorarium for consultancy from AbbVie, Arena Pharmaceuticals, Aslan, BenevolentAI, Chugai, Dermavant, Genentech, LEO Pharma, Lilly, Menlo Therapeutics, Novartis, Pfizer, Regeneron, Sanofi and UCB. ASP has been an investigator related to atopic dermatitis for AbbVie, Dermavant, Eli Lilly, Incyte and Regeneron and has received honoraria from Abbvie, Arcutis, Bausch, BiomX, Boeringer Ingelheim, Botanix, Bristol Myers Squibb, Catawba, Eli Lilly, Galderma, Gilead, Incyte, Leo, Novartis, Pfizer, RAPT, Regeneron, Sanofi/Genzyme, Seanergy and Union. AW is an advisor for Abbvie, Aileens, Almirall, Galderma, Hans Karrer, Leo Pharma, Eli Lilly, Merck, Novartis, Pfizer, Pierre Fabre, Regeneron, Sanofi-Aventis, a speaker for Abbvie, Almirall, Bioderma, Galderma, Leo Pharma, Eli Lilly, L'Oreal, Novartis, Pfizer, Pierre Fabre, Regeneron and Sanofi-Aventis and has received grants from Leo Pharma and Pierre Fabre. CF is Chief Investigator of the UK National Institute for Health Research-funded TREAT (ISRCTN15837754) and SOFTER (Clinicaltrials.gov: NCT03270566) trials as well as the UK-Irish Atopic eczema Systemic Therapy Register (A-STAR; ISRCTN11210918) and a Principle Investigator in the European Union (EU) Horizon 2020-funded BIOMAP Consortium (http://www.biomap-imi.eu/). He also leads the EU Trans-Foods consortium. His department has received funding from Sanofi-Genzyme for skin microbiome work. CV is an advisor for Leo Pharma, Sanofi, Pfizer, Abbvie, Novartis, Eli Lily and Almirall, a Speaker for Leo Pharma, Abbvie, Novartis, Sanofi and Astra Zeneca and has received Grants from Novartis, Sanofi and LEO Pharma. DJH received research grants from Abbvie, Astrazeneca, Galderma, LEO Pharma, Lilly, Novartis, Sanofi, UCB and is an advisor for Abbvie, Sanofi-Regeneron, LEO Pharma, Lilly, MedImmune, Novartis, Incyte, Janssen and Pfizer. KK has received grants from Japan Tobacco Inc., Kyowa Kirin, LEO Pharma, Maruho, Mitsubishi Tanabe Pharma, Ono Pharmaceutical, Pola Pharma, The Procter & Gamble Company, Taiho Pharma and Torii Pharmaceutical and has received personal fees from Maruho. RB is an Advisory Board Member, Consultant, Speaker and/or Investigator for and receives honoraria and/or grants from AbbVie, Arcutis, Arena Pharma, Asana BioSciences, Bellus Health, Bluefin Biomedicine, Boehringer-Ingelheim, Boston, CARA Therapeutic, Dermavant, Eli Lilly, EMD Serono, Evidera, Galderma, GlaxoSmithKline, Incyte, Inmagene Bio, Janssen, Kiniksa, Kyowa Kirin, LEO Pharma, Novan, Pfizer, Ralexar, RAPT Therapeutic, Regeneron, Respivant, Sanofi, Sienna, Target RWE and Vyne Therapeutics. RB is also an employee and shareholder of Innovaderm Research. PS is a Chief Investigator (CI) of the systemic and phototherapy atopic eczema registry (TREAT NL) for adults and children, receives a departmental independent research grants for TREAT NL registry from Pharma since December 2019, is involved in performing clinical trials with many pharmaceutical industries that manufacture drugs used for the treatment of, for example, psoriasis and atopic dermatitis, for which financial compensation is paid to the department/hospital. YAL has received honoraria or fees as a consultant from AbbVie Inc., Sanofi, Janssen, Pfizer and Genentech and as an advisory board member from Sanofi, Regeneron Pharmaceuticals, Pfizer, AbbVie Inc. and Dexcel Pharma; has received an independent research grant from AbbVie Inc. and has, without personal compensation, provided investigator services for Eli Lilly, Pfizer and AbbVie Inc. AMD has received compensation from the British Journal of Dermatology (reviewer and Section Editor), American Academy of Dermatology (guidelines writer) and National Eczema Association (grant reviewer). The rest of the authors have no conflicts to declare.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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