Agreement between dermatologists' selection of the lesional area and characteristics best representing atopic dermatitis severity: Online survey

Fig 1. Heatmaps showing selection of representative AD lesional areas for each photo by dermatologists of different levels of experience.

To the Editor: As technology is gaining ground in dermatology, evaluation of skin diseases based on digital photos is unavoidable. The cornerstone of teledermatology and decentralized virtual clinical trials is remote severity assessment based on digital photos.[1,2] Severity assessment of atopic dermatitis (AD) using Eczema Area and Severity Index or SCORing Atopic Dermatitis (SCORAD) is done by selection of a representative lesion. The aim of this online survey was to compare the selection of a representative AD lesional area for severity assessment based on digital photos between dermatologists with and without experience in online photo assessment.

The online survey was carried out among doctors from 6 dermatology university departments in Denmark and dermatologists from Romania with high experience in photo-based skin evaluations working in an online hospital setting. The survey consisted of 4 photos of typical AD from different body sites (arm, hand, and neck). First, the dermatologists were asked to choose the area on each photo they found most representative for severity assessment of all lesions in the photo. To assist in this process, a digital matrix overlay was used, consisting of 100 squares arranged in a 10 × 10 square grid, on average (Supplementary Fig 1, available via Mendeley at https://doi.org/10.17632/9bk5z85rts.1). Each square was identified by unique coordinates similar to a chessboard, which enabled selection of the squares overlaying the AD lesional area most representative for each photo. Following the selection of the most representative area of the entire photo, the dermatologists were asked to rank the following characteristics on each photo with a unique number from 1 to 6 (least important to most important): erythema, edema, excoriation, lichenification, dryness, and oozing, based on the relative importance for their selection.

To examine the overall selection of squares performed by all participating dermatologists, heatmaps were constructed. Wilcoxon signed rank test for unpaired measurements was used to analyze the difference in ranking of characteristics. Heatmap selections were compared using mean absolute error analysis. Statistical analysis was performed using R version 3.6.1 (R-Studio version 1.2.5001).
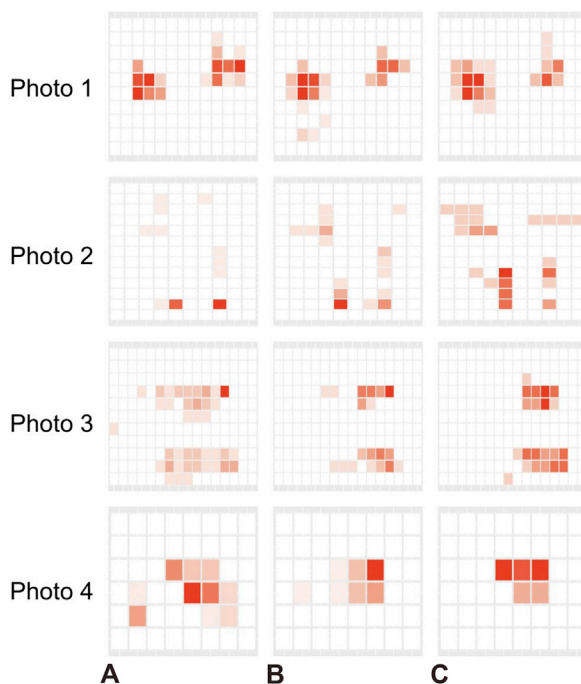
A total of 42 respondents (17 doctors from Denmark with more than 5 years of clinical experience in dermatology, 15 doctors from Denmark with less than 5 years of clinical experience in dermatology, and 10 doctors from Romania working in an online hospital and with more than 5 years of clinical experience in dermatology) completed the survey. Heatmaps of lesional areas chosen to be most representative for assessing AD severity showed a great agreement in the selection of squares defining the representative area between the different groups of dermatologists (Fig 1). Further, the importance of erythema, edema, excoriation, lichenification, dryness, and oozing for the selection of these areas are presented in Fig 2. There was good agreement between the importance of each characteristic among dermatologists from the online hospital (Romania) and dermatologists from the university departments (Denmark) (Supplementary Material, available via Mendeley at https://doi.org/10.17632/9bk5z85rts.1).

We found a good agreement among dermatologists in the selection of the most representative area and characteristics for severity assessment, regardless of their experience level in dermatology and with photo-based severity assessment.
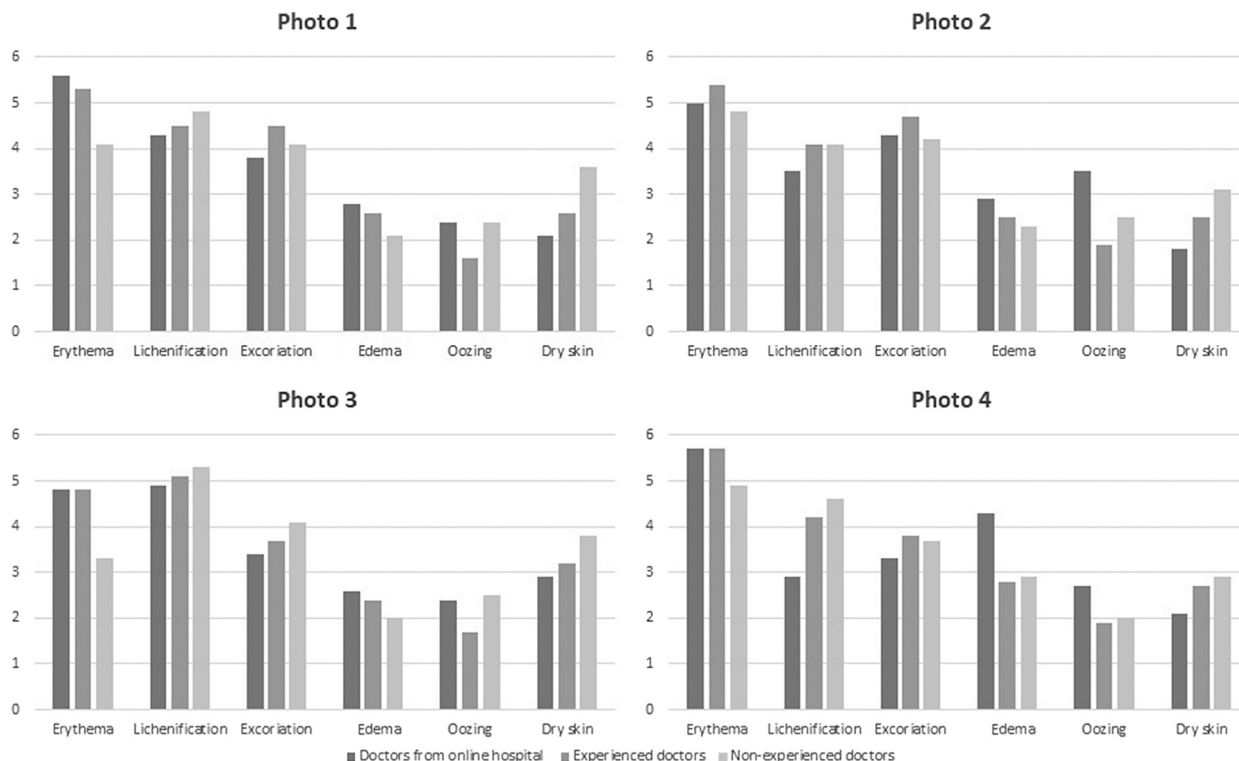
Fig 2. Ranking of erythema, lichenification, excoriation, edema, oozing, and dryness from 1 to 6 (least important to most important) based on the relative importance of each item in the selection of a representative AD lesional area in each photo by doctors of different levels of experience.

Zarqa Ali, MD, PhD,[a] Anders Daniel Andersen, PhD,[b] Theis Bjerre-Christensen, MD,[b] John Robert Zibert, PhD,[b] and Simon Francis Thomsen, MD, PhD, DMSc[a,c]

From the Department of Dermato-Venereology and Wound Healing Centre, Copenhagen University Hospital Bispebjerg, Denmark[a]; Studies&Me A/S, Copenhagen, Denmark[b]; and Department of Biomedical Sciences, University of Copenhagen, Copenhagen, Denmark.[c]

Correspondence to: Zarqa Ali, MD, PhD, Department of Dermatology, Bispebjerg Hospital, Copenhagen, Denmark

E-mail: zarqa_ali@hotmail.com

Conflicts of interest

REFERENCES
1. High WA, Houston MS, Calobrisi SD, Drage LA, McEvoy MT. Assessment of the accuracy of low-cost store-and-forward teledermatology consultation. *J Am Acad Dermatol.* 2000;42(5 Pt 1):776-783.
2. Ali Z, Zibert JR, Thomsen SF. Virtual clinical trials: perspectives in dermatology. *Dermatology.* 2020;236(4):375-382.