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**Auteurs:** Maxine Joly-Chevrier, Safin Aly, Kaoutar Bahous, & Philippe  
Authors: Lefrançois

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internet connection may complete their virtual appointments at a clinic with fast-wired internet, alleviating broadband internet challenges. This innovative program can help address existing gaps, but demands coordination, and introduces challenges related to travel and weather compared to direct TD visits. Since TD requires adequate broadband internet connection, direct care requires improvements in rural and remote areas across many Canadian provinces and territories.<sup>3</sup> Future research should address the efficacy of such programming to alleviate barriers to dermatological care. Limitations of the present study include the binary definitions of adequate broadband internet access, no data in Yukon, and a lack of nationwide dermatologist practice location data.

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### ORCID iD

Eric McMullen  <https://orcid.org/0000-0001-9961-7999>

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### Medical Letter

## Atopic Dermatitis Patient Needs Assessed through the Largest Online Patient Community: A Cross-Sectional Reddit Analysis

Maxine Joly-Chevrier<sup>1</sup> , Safin Aly<sup>1</sup>, Kaoutar Bahous<sup>2</sup>, and Philippe Lefrançois, MD, PhD, FRCPC, DABD<sup>3,4,5</sup>

### Keywords

eczema, social media, Reddit, online, patient education, sentiment analysis

To the Editor,

Atopic dermatitis (AD) is known as a high burden disease.<sup>1</sup> Patients are increasingly using social media to seek medical advice.<sup>2</sup> It is estimated that Reddit attracts more than 430 million users monthly.<sup>3</sup> Within Reddit, community groups are separated by topics named “subreddits.” The largest AD community is composed of approximately 72,000

users. Analyzing users’ posts with sentiment analysis may help physicians and AD organizations better assess and respond to patient needs.<sup>2,4,5</sup>

A total of 1128 random posts were retrieved from the subreddit “r/eczema.” Since its inception date in 2010, a minimum of 100 random posts per year were retrieved until 2021. For the year 2021, authors of the posts and associated 6730

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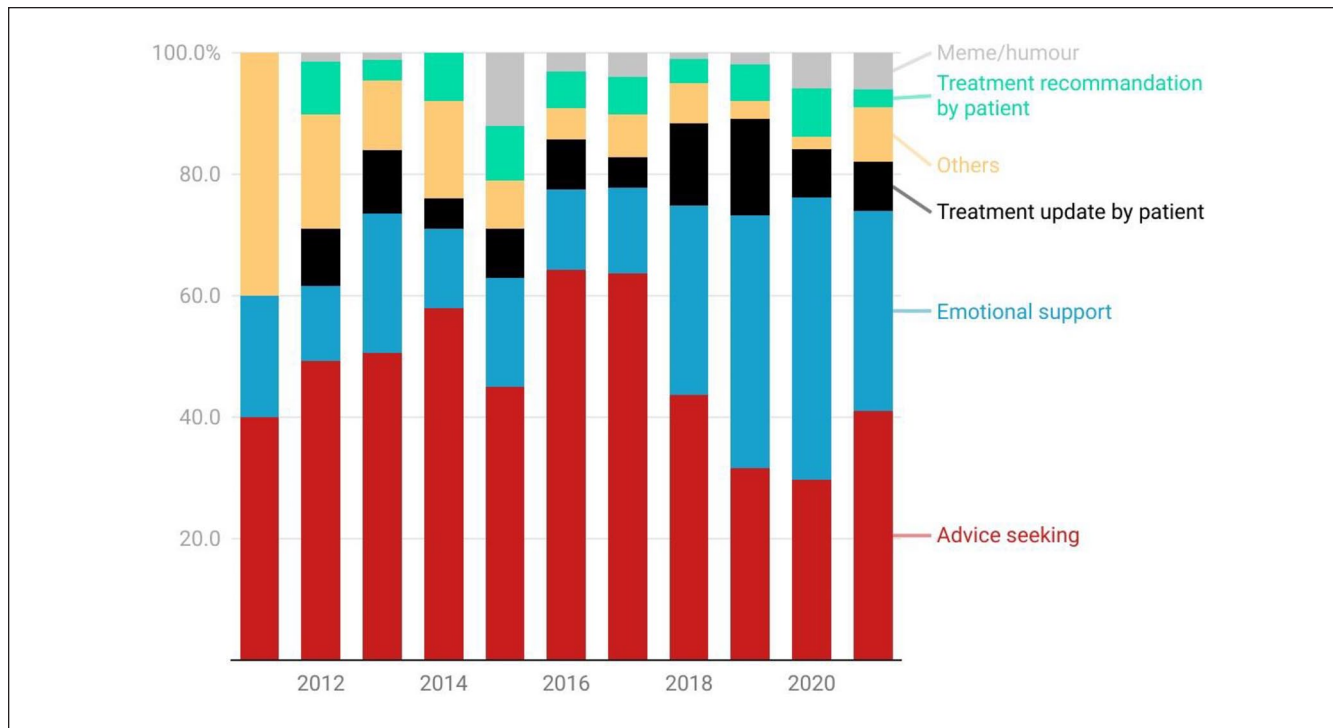


Figure 1. Post category distribution since year of online forum inception.

Table 1. Emotional and Sentimental Analysis Results.

Metric	Fear	Anger	Anticipation	Trust	Surprise	Sadness	Disgust	Joy	Negative	Neutral	Positive
Average of all posts (%)	4.15	2.79	0	6.51	2.75	3.37	2.56	3.75	8.23	81.26	10.43
Average of posts showing results (%)	26.01	24.28	0	32.36	21.62	23.19	23.56	21.19			
Ratio of posts with results to total number of posts	$\frac{1}{6}$	$\frac{1}{9}$	0	$\frac{1}{5}$	$\frac{1}{8}$	$\frac{1}{7}$	$\frac{1}{9}$	$\frac{1}{6}$			

The table shows the average of each emotion calculated by the NRClex emotional analysis tool present in all posts, the average of each emotion calculated from posts presenting results only, the ratio of posts presenting results calculated by the algorithm to the total number of posts and the sentiment score calculated by the algorithm implementation Valence Aware Dictionary for Sentiment Reasoning (VADER) named SentimentIntensityAnalyzer.

comments were screened and categorized. A sentiment analysis was conducted on all posts using Natural Language Processing, an artificial intelligence field analyzing human language. The dataset was processed using Pandas, Natural Language Toolkit, and NRClex, which are validated Python libraries (Supplementary Material). Following preprocessing steps (eg, removing special characters and tokenization),

every post was assessed by emotion and sentiment polarity (positive, neutral, or negative).

Among the 1128 random posts analyzed, 533 (47.3%) were related to advice seeking [encompassing personal disease question (251, 22.2%), advice seeking for potential treatment (144, 12.8%), non-personal general disease question (81, 7.2%), and skin inquiry with picture (57, 5.1%)],

<sup>1</sup>Faculty of Medicine, Université de Montréal, Montréal, QC, Canada

<sup>2</sup>Department of Computer and Software Engineering, Polytechnique Montréal, Montréal, QC, Canada

<sup>3</sup>Division of Dermatology, Department of Medicine, McGill University, Montréal, QC, Canada

<sup>4</sup>Division of Dermatology, Department of Medicine, Jewish General Hospital, Montréal, QC, Canada

<sup>5</sup>Lady Davis Institute for Medical Research, Montréal, QC, Canada

**Corresponding Author:**

Philippe Lefrançois, Department of Dermatology, Jewish General Hospital, 3755, Chemin de la Cote-Sainte-Catherine, Montréal, QC H3T 1E2, Canada.

Email: philippe.lefrancois2@mcgill.ca

280 (24.8%) to emotional support, 107 (9.5%) to treatment update by patient, 101 (9.0%) to other topics [educational material (57, 5.1%), treatment promotion (18, 1.6%), survey (11, 1.0%), and prevention questions (15, 1.3%)], 69 (6.1%) to treatment recommendation by patient and 38 (3.4%) to humour (Figure 1). Posts had a median of 93 [interquartile range (IQR): 72, 100] upvotes, which translates to “likes.” Posts had a median of 24 [IQR: 7, 45] comments. Based on 6730 comments in 2021, most users who commented (6579, 99.8%) did not specifically self-describe as non-physicians and no self-reported dermatologists replied to these posts.

Fear, anger, surprise, sadness, disgust, and joy exhibited comparable baseline averages between 3% and 4% across posts. Trust was accentuated at 7%, whereas anticipation was consistently absent. Analyzing non-zero emotional presence, intensities heightened with fear (26%), anger (24%), disgust (24%), trust (32%), surprise (22%), sadness (23%), and joy (21%). In the realm of sentiment distribution, trust manifested itself in 1 out of every 5 posts, followed by fear (1/6 posts) and sadness (1/7 posts) (Table 1). Of all posts, 81% had a neutral sentiment, 8% were negative, and 10% were positive.

Users of the subreddit “r/eczema” represent an active international AD patient community regularly seeking medical and emotional support. Our sentiment analysis provides insights into the emotional dynamics of patient discussions with trust being the most present sentiment. The presence of dermatologists and AD organizations is limited, near non-existent, on this platform. Given the anonymous identity of users and commenters, the lack of verified medical advice may promote the propagation of false and/or inaccurate information. Dermatologists and medical organizations can benefit from such a large audience to rapidly engage with patients.

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#### ORCID iD

Maxine Joly-Chevrier  <https://orcid.org/0000-0001-6706-8139>

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