

## Atopic Dermatitis Search Strategy Variation Among Systematic Reviews

Marissa Ayasse, BS<sup>1</sup>, Adnan Ahmed, BS<sup>2</sup>, Muhammad Yousaf, BA<sup>2</sup>, Jonathan I. Silverberg, MD, PhD, MPH<sup>1</sup>

1. Department of Dermatology, The George Washington University School of Medicine and Health Sciences, Washington, DC USA
2. Department of Dermatology, Feinberg School of Medicine, Northwestern University, Chicago, IL USA

### **Abstract:**

**Background:** Many different search strategies have been used in systematic reviews (SRs) of the atopic dermatitis (AD) literature. However, the impact of different search strategies on SR results is unknown.

**Objectives:** To evaluate different search strategies used in SRs of AD and the impact of different search strategies on the number of articles identified in SRs.

**Methods:** MEDLINE and EMBASE were searched for AD-relevant SRs. Search strategies for AD search terms were extracted. The most commonly used search terms were identified overall, and stratified by time, target population, journal specialty and research focus. Simulations were performed by running different combinations of search terms in MEDLINE and EMBASE. Search results were compared to determine the optimal search terms and number of terms to maximize search hits.

**Results:** Overall, 1,086 articles were screened, of which 250 SRs met inclusion criteria and 225 specified search strategies. Among the SR included, search results ranged from 1,043 to 481,311 in MEDLINE (median: 37,786) and 347 to 890,144 in EMBASE (median: 80,262). The mean number of search terms used across the 225 studies was 4.5 (SD 3.8, median 3). Twenty-eight papers searched only 1 term (12.4%), 119 papers searched between 2 and 4 terms (52.8%), and 78 papers searched 5 or more terms (35.7%). The number of SR's using only 1-2 (37.5% to 38.9%) search terms remained fairly constant, whereas SRs using 3-4 terms numerically increased (18.8% to 30.2%) between 1999-2009 to 2015-2019. Whereas, SRs using 5-6 terms (20.0% to 12.1%; logistic regression, odds ratio [95% confidence interval]: 0.24 [0.09-0.62]) or  $\geq 7$  (40.0% to 18.8%; 0.37 [0.14-0.97]) terms decreased in that time frame between 1999-2009 and 2015-2019. Overall, the most commonly searched terms were "atopic dermatitis" (n=166), followed by "eczema" (n=156), "dermatitis atopic" (n=81), "atopic eczema" (n=74), "neurodermatitis" (n=59), "besnier's prurigo" (n=29), "infantile eczema" (n=27), and "childhood eczema" (n=19). However, use of the term "atopic dermatitis" increased from 1999-2004 (25%) to 2005-2009 (79%) and continued at similar rates in 2010-2014 and 2015-2019. 1999-2003 to 2016-2019. The terms "dermatitis, atopic" (50% to 34.4%), "Besniers prurigo" (25% to 14%), "infantile eczema" (25% to 14%), "childhood eczema" (25% to 9%) were all used less frequently over time. Simulations revealed that the terms "eczema" and "atopic dermatitis" yielded the most hits in MEDLINE and EMBASE. "Eczema" and "atopic dermatitis" maximized the number of hits for any two-term combinations. The optimal number of search terms to maximize hits in

MEDLINE was 5 (“atopic dermatitis”, “eczema”, “neurodermatitis”, “dermatitis, atopic”, “besniers prurigo”) and in EMBASE was 4 (“atopic dermatitis”, “eczema”, “neurodermatitis”, “dermatitis, atopic”). Six-, seven-, and eight-term combinations did not yield additional search hits.

**Conclusion:** There was considerable heterogeneity of search strategies among SRs of the AD literature. In simulations, the optimal number of search terms was identified as 5 in MEDLINE and 4 in EMBASE. However, a substantial number of published SRs used a lower number and suboptimal combinations of search terms. Moreover, the number of such studies has significantly increased over time. While the number of SRs of AD have increased over time, an increasing proportion of these used potentially inadequate search strategies. We recommend that future studies use standardized search strategies in order to optimize search results.