

Google search trends about psoriasis treatment: what do people want to know about systemic medications for treating psoriasis?

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Google search trends about psoriasis treatment: what do people want to know about systemic medications for treating psoriasis?

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Abstract

This study investigates the most frequently asked questions regarding systemic treatments for psoriasis vulgaris using Google Trends and People Also Asked (PAA) tools, focusing on traditional DMARDs, biologics, and small-molecule inhibitors. Analyzing data from January 31, 2019, to January 31, 2024, Adalimumab was found to have the highest search volume, followed by Apremilast and Methotrexate in their respective categories. Based on Rothwell's Question Classification Criteria, questions about Adalimumab predominantly centered around their technical, factual details and cost of the medication. The study highlights significant public interest in these factors over their safety profile and it is likely influenced by Adalimumab's high direct-to-consumer marketing. Moreover, evaluation of 782 websites showed that potential patients were seeking commercial and government-based websites to learn more about systemic psoriasis treatment. According to the JAMA benchmark criteria, these source types also scored the highest in terms of information quality, while medical practice websites scored the lowest. The findings suggest the need for dermatologists to address factual details such as medication administration scheduling, dietary restrictions, and cost during patient consultations, and to guide patients towards high-quality online resources. Limitations include potential comprehensiveness of questions and evolving medication concerns.

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Original Manuscript

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Title: Google search trends about systemic psoriasis treatment: what do people want to know about biologics and JAK inhibitors?

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Google is the most widely used search engine worldwide.¹ While previous studies have utilized Google machine learning algorithms to assess commonly asked questions about various medical topics,^{2,3} no studies have employed these tools to explore queries surrounding dermatological conditions. Recognizing the internet's profound influence on patients, our study aimed to examine the most frequently asked questions

concerning systemic treatment for psoriasis vulgaris and evaluate the quality of medical information available online.

The Google Trends (GT) tool was utilized to compare the relative search volume (RSV) of traditional disease-modifying antirheumatic drugs (DMARDs), biologics, and small-molecule inhibitors used to treat psoriasis between 1/31/2019 and 1/31/2024. Trade names were used. For example, “Enbrel for psoriasis” was compared with “Humira for Psoriasis.” Subsequently, the People AlsoAsked (PAA) tool was utilized to generate the most asked questions about the most searched medication in each of the three categories. The questions were checked for relevance and classified based on Rothwell’s Criteria (Supplementary Figure 1). Cohen’s Kappa coefficient was calculated to determine level of interrater agreement. Additionally, the PAA tool was employed to extract internet sources sought by the readers. The quality of these information sources was determined based on the JAMA benchmark criteria.⁴ Statistical analyses were performed in R.

Adalimumab exhibited the highest search volume among all medications (RSV=1). Apremilast was the most searched among small molecule inhibitors and methotrexate among DMARDs (RSV=1). Adalimumab garnered the most fact-based questions overall, with the majority falling into the subcategories of technical details (52%, $p=0.011$) and cost (24%, $p<0.001$) (Table 1).

Table 1. Relative Proportion of Question Type for Apremilast, Adalimumab, and Methotrexate and Significance of Difference

Question Category	Question Subcategory	Apremilast (n=125)	Adalimumab (n=147)	MTX (n=180)	Apremilast vs Adalimumab (<i>P value</i>)	Apremilast vs MTX (<i>P value</i>)	Adalimumab vs MTX (<i>P value</i>)
Fact		33.6	46.3	32.7	0.035*	0.88	0.013*
	Cost	10.4	12.2	0.5	0.641	<0.001*	<0.001*
	Mechanism	2.4	4.1	3.3	0.435	0.636	0.72
	Technical	12	24.5	24.4	0.011*	0.007*	0.983
	Timeline of Treatment	6.4	5.4	4.4	0.726	0.451	0.677
Policy		35.2	25.2	41.7	0.072	0.255	0.002*
	Risks	33.6	23.8	40	0.074	0.256	0.002*
	Indications	1.6	1.4	1.7	0.836	0.964	0.859
Value		31.2	29.2	25.5	0.72	0.28	0.454
	Evaluation	17.6	17.7	17.2	0.983	0.932	0.906
	Prognosis	4.8	4.8	4.4	0.969	0.884	0.891
	Timeline of Clinical Course	8.8	6.1	3.8	0.395	0.073	0.35

MTX: methotrexate

Inquiries specifically revolved around scheduling of adalimumab administration, dietary restrictions linked to medication usage (ex. concurrent use with alcohol), and concerns about affording adalimumab.

Between apremilast and methotrexate, apremilast drew more cost-related questions ($p<0.001$) whereas methotrexate attracted more questions about its risks ($p=0.002$). The inter-rater agreement indicated a strong agreement in question categorization (Kappa coefficient of 0.96).

Our findings on adalimumab suggest that it has the most public awareness, possibly due in part to direct-to-patient marketing. According to data on advertisement expenses, AbbVie allocated almost \$500 million dollars towards advertising adalimumab in 2020, while roughly half of that amount (\$202 million) was dedicated to promoting risankizumab. In the same period, Amgen invested \$150.4 million dollars in advertising for apremilast.⁵

Nonetheless, most inquiries about adalimumab centered around its cost and objective details, rather than its safety. This aligns with trends observed in similar studies on rheumatoid arthritis and spinal surgeries,

where individuals sought more factual information about these topics, such as the timeline for treating rheumatoid arthritis and activity restrictions related to spine surgeries.^{2,3} The lower frequency of value-based questions on systemic psoriasis treatment suggests that individuals may find adequate information on those topics elsewhere, such as dermatologists.

Furthermore, 782 websites were classified, with the majority (46.3%) consisting of commercial sites such as Healthline. Social media websites made up 24.4%, government-based websites such as PubMed accounted for 15.2%, academic websites for 12.6%, and medical practice websites for 1.5%. In assessing the quality of these sources, commercial and government websites scored highest on average based on JAMA benchmark criteria with 3.1/4 and 3.2/4 points respectively. Medical practice websites scored the lowest, with an average of 1.0/4 points (Table 2).

Table 2. Evaluation of internet source categories and quality according to JAMA benchmark criteria

Category	Description	Percentage of Dataset	Average Source Quality Score
Commercial	Commercial organization that positions itself as a source of health information, includes medical device and pharmaceutical companies. (Example: Healthline, WebMD)	46.3	3.1/4
Academic	Institution with a clear academic mandate, including universities, academic medical centers, academic societies, and journals. (Example: Mayo Clinic)	12.6	2.3/4
Government	Websites ending in.gov or maintained by a national government (Example: PubMed)	15.2	3.2/4
Medical practice	Local hospital or dermatology practices without an academic affiliation.	1.5	1/4
Social media	Websites maintained by nonmedical organizations primarily designed for information sharing between internet users. Includes health blogs, internet forums, and support groups	24.4	2.1/4

Our analyses indicate that users are being directed to commercial and government-based websites most often when seeking information about psoriasis treatment. This is reassuring, as these websites received the highest scores based on source quality criteria. Surprisingly, academic websites scored lower on average, similar to social media websites. Finally, although individual medical practice websites were not referred to as often, they scored only 1 out of 4 on average, indicating an area for improvement both for these practices and the search engine. Enhancing the visibility and content quality of medical practice websites as determined by the JAMA benchmark criteria and optimizing search engine algorithms to prioritize higher-quality sources could improve patient access to reliable health information.

In summary, given that the internet has a tremendous impact on the dissemination and understanding of health-related information, dermatologists should consider tailoring their discussions when counseling patients on systemic medications for psoriasis. Emphasis should be placed on addressing a medication's administration schedule, dietary restrictions associated with its use, cost considerations, and side effect profile relative to alternative options. Additionally, dermatologists can guide patients on how to identify and access high-quality online resources, empowering them to make more informed decisions about their health. Study limitations include potential question comprehensiveness and the evolving nature of medication concerns over time.

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Supplementary Files

Figures

Question classification based on Rothwell's Criteria and subcategories specific to the dataset.

