

Diet and Dermatology: Google Search Results for Acne, Psoriasis, and Eczema

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PRACTICE POINTS

- It is important physicians be well-informed regarding Internet discourse to discredit unfounded recommendations.
- It is likely that patients seeking medical advice regarding their dermatologic condition and treatment will have done prior research on the Internet.
- Oftentimes, the information on educational health websites can be confusing to patients.
- Because of widespread Internet access to health-related information, patients may opt to self-diagnose and therefore delay seeking professional care.

It is difficult to regulate the abundance of medical information that is available to patients on the Internet. This systematic review evaluated content available online related to diet and 3 dermatologic conditions: acne, psoriasis, and eczema. Ultimately, our results indicated that most of the information that can be found online regarding diet and these dermatologic conditions is unfounded and/or misleading. Although current medical research may support some Internet findings, it is important to advise patients that many results of online searches for medical conditions are unconfirmed.

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Researching medical information currently is the third most common use of the Internet in the United States,¹ with the majority of adults using the Web as their first source for health information before seeing a physician.² When assessing health-related information online, resources can be grouped into 4 categories:

(1) those attributed to self-proclaimed experts, (2) promotional, (3) social media, and (4) educational.³ Access to such a wide range of sources may give readers the opportunity to share personal anecdotes and opinions, thereby serving as a forum for information that essentially cannot be validated. Although such websites may include useful information and cite current literature, in other instances health-related information may be misleading or fabricated.³

In a study evaluating 291 skin conditions and related Google trends, acne, psoriasis, and eczema were among the most burdensome diseases, with acne yielding the highest number of search results.⁴ Results of the study indicated a positive correlation between disease burden and online search interest.⁴ The impact of these online searches and the validity of Google search results are topics worth considering, as more dermatology patients are relying on holistic and nonpharmaceutical approaches to treatment and disease management.⁵ The purpose of this study was to evaluate content on diet and dermatology available on the Internet for acne, psoriasis, and eczema.

Methods

Google searches were performed in December 2017 using the terms *diet and acne*, *diet and psoriasis*, and *diet and eczema*. The first 10 results for each respective search were reviewed for recommendations about which foods to incorporate in the diet and which to avoid. They also were classified according to the following 4 website categories: (1) those attributed to self-proclaimed experts, (2) promotional, (3) social media, and (4) educational. The recommendations gathered from the 30 websites were then compared to the current literature assessing the impact of diet on these respective conditions by conducting

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The eTable is available in the Appendix online at www.mdedge.com/cutis.

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PubMed searches of articles indexed for MEDLINE using the same terms.

Results

The results of this study are outlined in the eTable.

Acne—Our Google search using the term *diet and acne* produced 17,500,000 results. Of the first 10 search results, 40% (4/10) were websites attributed to self-proclaimed experts, 40% (4/10) were educational resources, and 20% (2/10) were promotional websites. Most of the websites advised acne patients to avoid high glycemic index foods (90% [9/10]) and dairy products (90% [9/10]). When discussing which foods to include in the diet, 70% (7/10) of websites recommended that patients incorporate omega-3 fatty acids and antioxidants in the diet.

Research has shown that a low glycemic index diet can lead to a decrease in patients' acne lesion counts in some instances.^{6,7} In a case-controlled study of 2258 patients on a popular weight loss diet that emphasized low glycemic index foods, 87% of participants reported a reduction in acne and 91% reported a decrease in their dosage or number of acne medications.⁷ Still, the exact correlation between acne development and consumption of glycemic index foods has not been confirmed. However, high glycemic index diets have been linked to hyperinsulinemia, indicating that insulin levels may play a role in acne formation.⁸ The majority of other currently available studies evaluated the potential link between dairy consumption and acne. A retrospective analysis of 47,355 women spanning 12 weeks showed a positive link between increased dairy consumption, specifically skim milk, and acne formation. Despite the positive trend, limitations such as recall bias made it difficult to draw a conclusion based on these findings.⁹ However, results of a longitudinal questionnaire-based population study evaluating the impact of dairy consumption on acne in 2489 adolescent patients confirmed a positive correlation.¹⁰ Studies conducted in 2009 and 2011 concluded that milk consumption results in elevated insulinlike growth factor 1 levels, which were linked to comedogenesis.^{8,11}

Currently, there are well-described mechanisms to explain the association of dairy consumption and glycemic index with acne. Confirming a correlation between acne development and dairy consumption suggests that a dairy-free diet may benefit acne patients.⁵ Other trials indicate that low glycemic index diets are beneficial in treating acne.^{6,7} Therefore, some of the recommendations made in our search results may be of merit; however, there is minimal evidence proving the benefits of the other dietary recommendations made in the websites we evaluated.

Psoriasis—Our Google search using the term *diet and psoriasis* yielded a total of 9,420,000 results. Of the first 10 search results, 40% (4/10) were websites attributed to self-proclaimed experts, 30% (3/10) were promotional, and 30% (3/10) were educational. Seventy

percent (7/10) of websites recommended avoiding alcohol and 60% (6/10) recommended avoiding gluten, with others discouraging consumption of red meat. Most of the websites encouraged patients to consume omega-3 fatty acids and antioxidants, while a few also recommended vitamins A, D, and E, as well as evening primrose oil supplements.

Although current research indicates a positive correlation between excessive alcohol use and psoriasis severity, it is still unclear whether alcohol consumption can be directly linked to the disease.¹²⁻¹⁴ Likewise, despite belief that increased oxidative stress likely contributes to inflammation in psoriasis, there is little evidence linking antioxidants to improvement in psoriasis symptoms.¹² However, the current literature is inconsistent regarding the effects of fish oil supplementation on psoriasis.¹² In a randomized double-blind study of 145 patients, there was no significant difference in psoriasis area and severity index scores between a control group and a treatment group receiving fish oil supplementation.¹⁵ In another RCT of 45 participants, those given daily very long-chain omega-3 fatty acid supplements saw no difference in psoriasis symptoms.¹⁵ Despite debate, literature assessing the impact of gluten-free diets has described improvement in psoriasis lesions in patients with celiac-specific antibodies.¹⁶ Although some observational studies described vitamin D supplementation to be beneficial in the treatment of psoriatic lesions, a more recent RCT found no significant difference between control and treatment groups.¹⁷⁻¹⁹

Studies also have revealed that certain eating patterns, such as those associated with the Mediterranean diet that is rich in fruits, vegetables, whole grains, and omega-3 fatty acids may be linked to improved endothelial function scores and reduced C-reactive protein and IL-18 levels.^{20,21} In a double-blind RCT of 75 patients with plaque psoriasis, mean (SD) psoriasis area and severity index scores decreased by 11.2 (9.8) in a group treated with omega-3 fatty acids compared to 7.5 (8.8) with omega-6 fatty acids ($P=.048$).²²

Although excessive alcohol use may be linked to psoriasis, there is no conclusive evidence indicating causation, thereby discrediting online claims.¹²⁻¹⁴ Research has revealed that gluten-free diets in psoriasis patients with celiac disease may improve psoriasis treatment¹⁶; however, sufficient evidence is lacking for diets low in gluten and high in polyunsaturated fatty acids or antioxidant supplementation. Of the dietary supplements recommended in the search results we reviewed, fish oil appears to be the most promising, but no recommendations can be made based on the current research.

Eczema—Our Google search using the term *diet and eczema* yielded 1,160,000 results, with 50% (5/10) of websites attributed to self-proclaimed experts, 30% (3/10) to educational websites, and 20% (2/10) to promotional sites. Of the first 10 results, 80% (8/10) recommended that patients with eczema avoid milk/dairy and 50% (5/10) advised to avoid soy and wheat/gluten. Other websites

indicated to avoid eggs, nuts, and artificial sweeteners. Patients were encouraged to incorporate omega-3 fatty acids in their diets, and a few sites recommended bananas, coconut oil, olive oil, and various teas.

In a review of 11 studies with a total of 596 participants, supplementation with vitamins D and E, fish oil, olive oil, and linoleic acid was evaluated for the treatment of eczema.²³ Although results indicated modest improvement of eczema severity with supplementation of fish oil, evidence favoring this treatment is limited and unconvincing. Furthermore, some evidence indicates that elimination diets are only appropriate for patients with food allergies.²⁴ In a study evaluating an egg-free and dairy-free diet for eczema patients, only participants with positive egg-specific serum IgE levels saw improvement in disease severity.²³ Even though IgE-mediated food allergies have been reported in 40% of children with moderate eczema, the contribution of these allergies to eczema is questionable.²⁵

There is little evidence in the literature to indicate a definitive correlation between the foods mentioned in the search results we evaluated and the development of eczema; however, for patients with food allergies and eczema, elimination diets may decrease disease severity.^{25,26} There is insufficient evidence to suggest a benefit from evening primrose oil or fish oil supplementation, thereby debunking claims found online.

Comment

Although our Google search results included a wide range of sources and information regarding diet and dermatologic conditions such as acne, psoriasis, and eczema, most of the information we found was either unfounded or misleading. Study limitations in the current literature include small sample size, potential recall bias, lack of appropriate controls, incomplete reported results, and the failure to clearly define skin changes.

When considering the accuracy and type of information regarding skin conditions that is available on the Internet, it is important to note that most of the results we reviewed were webpages attributed to self-proclaimed experts. Although educational websites also were included in the search results, whether or not patients prefer or understand the content of such websites is still unknown; therefore, health organizations should consider revising online patient education materials to allow universal comprehension.²⁷

Furthermore, it is important to consider the impact that widespread Internet access may have on the physician-patient relationship. Having access to health-related information online and being able to potentially self-diagnose could delay or deter patients from seeking professional advice or care.³ A study evaluating the impact of online searches on the physician-patient relationship among 175 patients determined that 36.5% of patients gathered information online prior to their consultation with a physician, while 67.3% chose to complement the information

given to them by their physician with online resources.²⁸ Based on these statistics, it is important that physicians be up-to-date with Internet discourse to discredit unfounded recommendations. Ultimately, when it comes to diet and dermatology, patients ought to be skeptical of the information currently available on the Internet, given that most of it is unsubstantiated by medical research.

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APPENDIX

eTABLE. Top Google Search Results for Acne, Psoriasis, and Eczema

Source Title	URL	Category	Recommended Foods to Incorporate in the Diet	Recommended Foods to Avoid
Acne				
Can foods make you break out?	https://www.webmd.com/skin-problems-and-treatments/acne/features/worst-foods-for-your-skin#1	Educational	Antioxidants, broccoli, fish oil supplementation, goat's milk, leafy greens, omega-3 fatty acids, sardines	Cow's milk, gluten, high glycemic index foods, vegetable oils
10 lifestyle steps to help your acne	https://www.webmd.com/skin-problems-and-treatments/acne/features/lifestyle#1	Educational	Beans, vegetables, whole grains	High glycemic index foods
5 foods to eat — and 5 not to eat — to reduce acne outbreaks	https://www.anmmariagianni.com/5-foods-that-reduce-breakouts/	Self-proclaimed experts	Antioxidants, flaxseeds, green tea, omega-3 fatty acids, oysters, probiotics	Chocolate, cow's milk, high glycemic index foods, processed foods, sugar
The relationship of diet and acne: a review	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2836431/	Educational	Omega-3 fatty acids; vitamins A, D, and E	Dairy, high glycemic index foods
How to get rid of acne with diet & lifestyle: clear skin forever	https://www.clearskinforever.net/book/	Promotional	Fermented foods, omega-3 fatty acids, probiotics, saturated fat	Alcohol, dairy
The acne diet: a beginner's guide to clear skin eating	https://www.foreo.com/mysa/best-diet-get-rid-acne/	Promotional	Antioxidants, Greek yogurt, green tea, leafy greens, oysters, pumpkin seeds	Alcohol, dairy, high glycemic index foods, processed foods
Yes! foods may fight acne	https://www.nytimes.com/2016/10/21/well/eat/yes-foods-may-fight-acne.html?_r=0	Self-proclaimed experts	Antioxidants, dark chocolate, extra-virgin olive oil, green tea, leafy greens, omega-3 fatty acids, red wine	Dairy, high glycemic index foods
Diet and acne	https://www.acne.org/diet.html	Self-proclaimed experts	Antioxidants, omega-3 fatty acids	Dairy, high glycemic index foods, iodine, omega-6 fatty acids
Can food cause acne?	https://www.doctoroz.com/article/can-food-cause-acne	Self-proclaimed experts	Antioxidants, dark chocolate; high-fiber foods; green tea; omega-3 fatty acids; selenium; vitamins A, C, and E; zinc	Chocolate, dairy, high glycemic index foods, processed foods
Growing evidence suggests possible link between diet and acne	https://www.aad.org/media/news-releases/growing-evidence-suggests-possible-link-between-diet-and-acne	Educational	Antioxidants, beans, multigrain bread, peanuts, vegetables	High glycemic index foods, dairy

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eTABLE. (continued)

Source Title	URL	Category	Recommended Foods to Incorporate in the Diet	Recommended Foods to Avoid
Psoriasis				
Diet and psoriasis	https://www.psoriasis.org/about-psoriasis/treatments/alternative/diet-supplements	Educational	Antioxidants, beans, eggs, nuts, omega-3 fatty acids, whole grains	Processed foods, red meat, refined sugars, trans fats
8 foods that affect psoriasis	https://www.everydayhealth.com/psoriasis/diet/foods-that-affect-psoriasis/	Self-proclaimed experts	Antioxidants, milk thistle, omega-3 fatty acids, oregano oil, evening primrose oil, turmeric; vitamins A and D	Alcohol, dairy, gluten, red meat
8 foods that might cause psoriasis flare-ups	https://www.everydayhealth.com/psoriasis/diet/foods-to-avoid-if-you-have-psoriasis/	Self-proclaimed experts	Lean meats	Alcohol, citrus, dairy, gluten, processed foods, red meat, spices
Psoriasis and your diet	https://www.webmd.com/skin-problems-and-treatments/psoriasis/psoriasis-food-diet	Educational	Antioxidants, beans, lean meats, legumes	Coffee, eggs, high glycemic index foods, processed foods, tomatoes
Diet and psoriasis	https://www.webmd.com/skin-problems-and-treatments/features/diet#1	Educational	Fish oil supplementation, vitamin D	Alcohol, gluten
12 best and worst foods for psoriasis	http://www.health.com/health/gallery/0,,2076711,00.html	Self-proclaimed experts	Antioxidants, avocados, carrots, lean meats, nuts, omega-3 fatty acids, squash, whole grains	Alcohol, dairy, fried foods, gluten, refined sugar, tomatoes
Psoriasis	https://www.drweil.com/health-wellness/body-mind-spirit/autoimmune-disorders/psoriasis/	Promotional	Antioxidants, carrots, corn, leafy greens, milk thistle, omega-3 fatty acids, evening primrose oil, squash, sweet potatoes	Alcohol, red meat, saturated fats
5 eating strategies to help soothe psoriasis	https://www.prevention.com/beauty/skin-care/a20448771/best-diet-for-psoriasis-and-inflammation/	Self-proclaimed experts	Antioxidants, omega-3 fatty acids	Alcohol, omega-6 fatty acids, refined sugar, saturated fats
Psoriasis diet, essential oils & supplements for natural treatment	https://draxe.com/psoriasis-diet-5-natural-cures/	Promotional	Aloe vera, antioxidants, fish oil supplementation, herbs and spices, high-fiber foods, omega-3 fatty acids, probiotics, vitamins A and D, zinc	Alcohol, gluten, processed foods, refined sugar
Psoriasis: how to overcome it naturally	https://bodyecology.com/articles/psoriasis_how_to_overcome_naturally.php	Promotional	Extra-virgin olive oil; fish oil supplementation; omega-3 fatty acids; probiotics; vitamins A, D, and E	Gluten, red meat, refined sugar

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eTABLE. (continued)

Source Title	URL	Category	Recommended Foods to Incorporate in the Diet	Recommended Foods to Avoid
Eczema				
Diet and eczema: the facts	https://www.webmd.com/skin-problems-and-treatments/eczema/treatment-16/eczema-diet	Educational	Antioxidants; black, green, or oolong teas; omega-3 fatty acids; probiotics; whole grains	Allergens: dairy, eggs, nuts, wheat
Targeting eczema triggers	https://www.everydayhealth.com/eczema-pictures/eczema-triggers-to-avoid-0310.aspx	Self-proclaimed experts	Antioxidants	Allergens: dairy, eggs, nuts, wheat
Eczema causes and triggers	https://nationaleczema.org/eczema/causes-and-triggers-of-eczema/	Educational	Omega-3 fatty acids	Alcohol, artificial sweeteners
7 foods that naturally fight eczema	https://www.chateleine.com/health/wellness/foods-to-eat-if-you-have-eczema/	Self-proclaimed experts	Bananas, beef or chicken broth, buckwheat, green onions, mung bean sprouts, omega-3 fatty acids, potatoes, rice milk	Eggs, milk, peanuts, soy, tree nuts, wheat
Eczema and diet: the top 8 food triggers	https://www.thehealthyhomeeconomist.com/eczema-and-diet-top-food-triggers/	Promotional	Probiotics	Acidic foods, dairy, eggs, gluten, peanuts, soy, spices, tree nuts
Eczema diet	http://eczema-natural-healing.com/eczema-diet.html	Promotional	Antioxidants, coconut oil, extra-virgin olive oil, flaxseeds, omega-3 fatty acids, oysters, potatoes	Acidic foods, artificial sweeteners, dairy, high glycemic index foods, meats, soy, yeast
How I healed my daughter's eczema with a raw diet	https://www.mindbodygreen.com/0-15509/1-healed-my-daughters-eczema-with-a-raw-diet.html	Self-proclaimed experts	Antioxidants, avocado, bananas, coconut oil, whole grains, nuts, olive oil, omega-3 fatty acids, seeds	Eggs, high glycemic index foods, meat
Eczema triggers and irritants	https://patient.info/health/atopic-eczema/eczema-triggers-and-irritants	Self-proclaimed experts	Natural oil supplements	Cow's milk, eggs, fish, nuts, soy, wheat
Eat these 3 foods to treat eczema	http://www.readersdigest.ca/food/healthy-food/3-foods-treat-eczema/	Self-proclaimed experts	Omega-3 fatty acids, oolong tea, probiotics	Eggs, milk, nuts
Eczema (atopic dermatitis)	https://www.allergy.org.au/patients/skin-allergy/eczema	Educational	Fish oil supplementation, probiotics	Artificial food coloring or preservatives, cow's milk, soy