

# From Gut to Glow using Probiotics to Prevent Skin Problems

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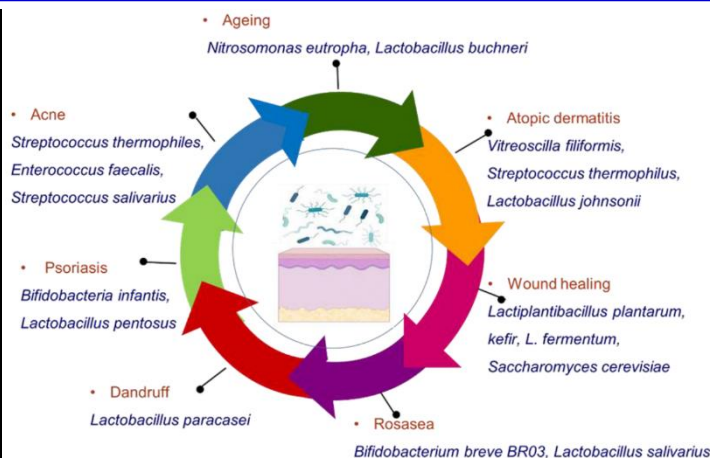
Beneath the apparent successes of contemporary medical practices, a concealed epidemic persists. Non-fatal ailments, such as dermatological disorders, have now taken precedence, significantly impacting our overall quality of life. According to the "Global burden of disease" report, these conditions rank as the fourth most significant threat globally, exerting a subtle yet substantial influence on millions.

The skin, acting as the body's expansive and versatile protective barrier, plays a multifaceted role beyond mere aesthetics. It serves functions such as sensation, heat regulation, protection, and defense against external threats. However, in developing countries, crowded living conditions, limited awareness, and financial constraints collectively contribute to the harsh reality of prevalent skin diseases.

## Diseases Associated with Skin

Compounding the issue, these disorders can obscure more profound health threats like HIV/AIDS, leprosy, and onchocerciasis, underscoring the critical importance of timely diagnosis. While conventional treatments include ointments, antifungals, antibiotics, and herbal remedies, each therapeutic approach comes with its own set of challenges. Prolonged use of antibiotics fosters resistance, antifungal treatments may induce allergic reactions, and even seemingly benign topical creams can result in irritation, dryness, or unwanted hair growth. Herbal remedies, though generally free of side effects, demand a level of patience akin to saintly virtues.

Evidently, a more sophisticated armamentarium is imperative for addressing these challenges. As advocated by Nankervis *et al.* (2016), operational research should guide us towards interventions that not only heal but also empower, bringing us closer to realizing the full potential of skin health.



**Fig. 1: Applications of Probiotics for Health Well-being**

## Applications of Probiotics

Numerous research studies have demonstrated the efficacy of probiotics through oral and topical administration in treating various disorders, circumventing adverse effects associated with conventional treatments (Kumari *et al.*, 2023). The International Scientific Association for Probiotics and Prebiotics (ISAAP) defines probiotics as live microorganisms that, when administered in adequate quantities, confer health benefits to the host. Compelling evidence indicates that the influence of gut microbiota extends to distant organs, including the skin, where probiotics exhibit therapeutic effects on conditions such as atopic dermatitis, psoriasis, rosacea, acne vulgaris, and other skin diseases. Topical application of probiotics has been shown to inhibit pathogen growth and prevent their adhesion to the skin (Najem *et al.*, 2017).

This article critically reviews the existing knowledge on the efficacy of probiotics in treating skin disorders, elucidating the underlying mechanisms. The correlation between gut microbiota balance and various skin disorders underscores the potential of intentionally modifying the gut microbiome to yield promising outcomes in treating skin conditions. Diet, a significant factor influencing gut microbiota, can be modulated effectively by incorporating probiotics,

presenting a novel therapeutic avenue in the face of antibiotic resistance and adverse effects associated with current treatments.

Recent scientific developments have heightened interest in probiotics as an alternative therapy for skin disorders, supported by positive study outcomes. Evidence suggests a deficiency of specific intestinal bacteria, notably Bifidobacteria, contributing to an imbalance in the Th1/Th2 immune response in patients with atopic dermatitis (AD). Supplementation of probiotics in the diet of pregnant women in the last trimester has demonstrated a reduction in AD occurrence in neonates. Clinical trials involving probiotic supplementation in children suffering from AD have shown a decrease in the AD scoring index.

### Benefits of Probiotics

Probiotics have also proven effective in treating Acne vulgaris. Specific strains such as *Lb.brevis* and *Lb.rhamnosus* have been associated with inhibiting the growth of acne-causing bacteria. Peptides produced by *Lb.brevis* stimulate the growth of beneficial bacteria, indirectly controlling Acne vulgaris. Additionally, the expression of IGF-1, a factor linked to acne symptoms, decreased with the inclusion of *Lb.rhamnosus* in the diet. Historical studies, such as Robert H. Silver's 1961 investigation, reported improvements in acne symptoms in patients administered *Lb.acidophilus* and *Lb.bulgaricus*. A study involving Korean women revealed a correlation between gut microbial alterations and rosacea. Combining doxycycline and oral probiotics demonstrated positive outcomes in rosacea treatment, with doxycycline inhibiting pathogenic bacterial

growth, and probiotics promoting the proliferation of beneficial bacteria.

Advancements in topical probiotic applications have exhibited positive effects in treating skin disorders such as acne vulgaris, rosacea, and psoriasis. Topical floras compete with pathogens for nutrients, inhibiting their growth, while increased production of ceramide and mucin traps pathogens. The application of topical Bifidobacterium longum lysate has demonstrated efficacy in reducing skin dryness, reactivity, and aging (Guéniche *et al.*, 2010).

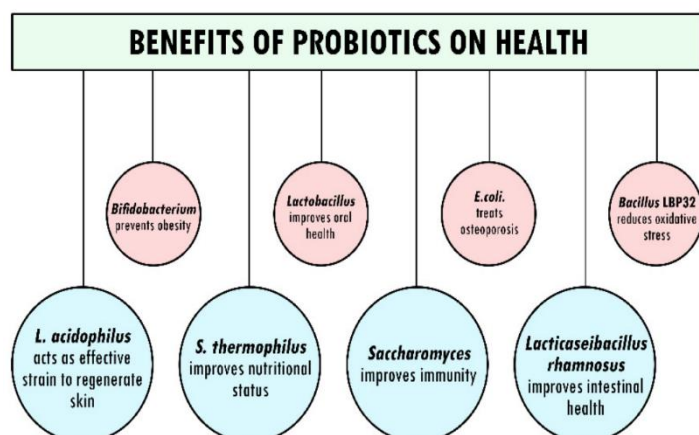
### Conclusion

Dermatological conditions represent a significant area of concern for researchers in the medical field due to their status as primary indicators of various serious diseases, such as cancer, HIV/AIDS, and the persistent human pursuit of aesthetically pleasing appearances. Current interventions for alleviating skin disorder symptoms include topical treatments, retinoids, moisturizers, medications, and light therapies; however, a definitive treatment remains elusive. Recent studies have highlighted the potential role of gut microbiota as a concealed regulator of skin health, proposing the use of gut-microbial balance as an alternative therapeutic avenue for addressing skin disorders.

This review focuses on elucidating the mechanisms underlying the development of diverse skin disorders, examining existing treatments, and exploring the influence of gut microbiota in sustaining optimal skin health. Additionally, it delves into available evidence suggesting the efficacy of probiotics in the treatment of skin disorders. Probiotics emerge as promising modulators of the skin microbiota, unveiling their potential as a covert regulator of skin health. Consequently, the integration of probiotics into the treatment paradigm for skin disorders could prove to be a promising and effective approach in the future landscape of medical interventions.

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