

Phytotherapeutic Approach to Skin Care: A Study on the Efficacy of a Herbal Facepack Blend

Running Title: Phytotherapeutic Approach to Skin Care: A Study on the Efficacy of a Herbal Facepack Blend

¹Ansari Iram Abdul Raheman

and ²Syed Ayesha Fatima

Article Info

¹Intern, BUMS, ZVM Unani Medical College & Hospital, Camp, Pune – 411001, Maharashtra, India

²Professor, Department of Moalijat, ZVM Unani Medical College & Hospital, Camp, Pune, Maharashtra, India

Corresponding Author:

Ansari Iram Abdul Raheman,
Intern, BUMS, ZVM Unani Medical College & Hospital, Camp, Pune, Maharashtra, India
Email: ansariiram2326@gmail.com
Telephone: 7058098952

Received: 10/09/2026

Accepted: 19/10/2026

Published: 22/10/2026

DOI: 10.5281/zenodo.23557995

Publisher's Note: IJABR Press stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: ©2026 by the author(s). Licensee IJABR Press, India. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution- Share Alike (CC BY - SA) license.

Abstract

Background: Skin is an important protective organ and is continuously exposed to environmental pollutants, ultraviolet radiation, microorganisms and other factors that may contribute to acne, pigmentation, dullness, altered skin texture, dryness and other cosmetic skin concerns. Herbal medicines have traditionally been used for maintaining skin health because of their diverse biological properties. Several medicinal plants possess antioxidant, anti-inflammatory and antimicrobial activities that may be beneficial in topical skin care. Turmeric and neem, for example, have been investigated for their potential dermatological applications. However, clinical evidence for multi-herbal facepack formulations remains limited.

Aim: The present study was conducted to evaluate the efficacy and tolerability of a polyherbal facepack blend for selected skin-care concerns.

Materials and Methods: An observational interventional study was conducted at ZVM Unani Medical College & Hospital, Camp, Pune. A total of 100 participants, aged 15–50 years, including both males and females, were included. The herbal facepack consisted of Neem (5%), Turmeric (5%), Sandalwood (10%), Beetroot (10%), Multani mitti (50%), Saad kufi (10%), Orange peel (5%) and Lemon peel (5%). Participants were instructed to apply the facepack three times per week for four consecutive weeks. The clinical response was assessed using predefined skin-related parameters including acne/breakouts, blackheads/whiteheads, hyperpigmentation, dark spots, uneven skin tone, dullness, dehydration, fine lines/wrinkles, redness/inflammation, open pores and excessive oiliness/dryness.

Results: Among the 100 participants, 80% showed improvement following the intervention, 18% showed moderate improvement and 2% showed no improvement. Overall, the findings demonstrated a favourable response to the herbal facepack during the study period. The formulation was generally well tolerated. Increased dryness or itching was observed in some participants with dehydrated skin.

Conclusion: The present study suggests that the investigated polyherbal facepack may have beneficial effects on several common skin-care concerns and may be a useful herbal approach for topical skin care. However, controlled studies with larger sample sizes, objective dermatological measurements and longer follow-up are required to establish its efficacy and safety more conclusively.

Keywords: Herbal medicine; phytotherapy; facepack; skin care; turmeric; neem; pigmentation; acne; polyherbal formulation; Unani medicine.

1. Introduction

The skin is the largest organ of the human body and acts as an essential barrier between the internal

environment and external surroundings. It protects against physical, chemical and microbial insults and contributes to thermoregulation, sensation and

maintenance of homeostasis. The stratum corneum and associated barrier systems regulate water loss and help protect the body from external challenges.[1,2]

Skin appearance and health may be influenced by several factors, including age, nutrition, hormonal status, environmental pollution, ultraviolet radiation, stress, hydration and personal skin-care practices. Oxidative stress and ultraviolet exposure are important contributors to photoaging and visible changes such as wrinkles and pigmentation.[3-6]

Common skin concerns such as acne, comedones, hyperpigmentation, dark spots, uneven skin tone, dullness, dryness, excessive oiliness, enlarged pores and inflammatory changes may affect an individual's physical appearance and quality of life. Acne is a common inflammatory disorder, while pigmentary concerns are among the frequent reasons for seeking cosmetic and dermatological care.[15-18]

Although numerous synthetic cosmetic and dermatological preparations are available, increasing interest has developed in herbal and plant-based approaches because of their traditional use and the presence of biologically active phytoconstituents. Evidence-based reviews indicate that botanicals may possess antioxidant, antimicrobial, anti-inflammatory, moisturizing, photoprotective and other skin-related activities, although the strength of evidence varies considerably between individual plants and preparations.[9,14,23]

Phytotherapy refers to the therapeutic use of medicinal plants and their preparations. Turmeric (*Curcuma longa*) has received considerable scientific attention because curcuminoids and related constituents have demonstrated antioxidant and anti-inflammatory activities. Systematic reviews have identified clinical studies of topical and oral turmeric/curcumin in several dermatological conditions, while also emphasizing that further well-designed clinical studies are required.[7-11]

Neem (*Azadirachta indica*) has a long history of traditional medicinal use and has been investigated for dermatological applications. Reviews describe a range of phytoconstituents and pharmacological activities relevant to skin health, while emphasizing the need for stronger clinical evidence.[12,13]

A facepack is a topical preparation traditionally used for cleansing, absorbing excess surface oil, improving the appearance of the skin and providing a convenient method of applying multiple botanical ingredients to facial skin. Evidence from clay-mask research also suggests that absorbent topical masks may influence oiliness and acne-related parameters, although results from a specific formulation cannot be assumed from its individual ingredients.[19]

Combining several herbal and naturally derived ingredients may provide complementary effects; however, the efficacy and tolerability of any specific formulation must be evaluated clinically rather than assumed from the properties of its individual ingredients. Therefore, the present study was undertaken to evaluate the efficacy and tolerability of a specifically formulated herbal facepack blend in individuals with selected common skin-care concerns.

2. Literature Review

2.1 Turmeric and Curcumin

Turmeric and curcumin have been investigated in dermatology because of their anti-inflammatory, antioxidant and antimicrobial properties. A systematic review of clinical studies identified topical and oral applications across conditions including acne, atopic dermatitis, psoriasis, radiodermatitis and other skin disorders, but concluded that the clinical evidence remains limited and heterogeneous.[7] Subsequent systematic and narrative reviews have likewise reported potential dermatological effects while calling for larger human studies and better standardized delivery systems.[8-11]

2.2 Neem

Neem has a long history of traditional use in Indian medicine. Contemporary dermatological reviews discuss its phytochemical constituents and reported antimicrobial, anti-inflammatory and other pharmacological activities, supporting continued investigation of neem-containing topical preparations while recognizing the limitations of the available clinical evidence.[12,13]

2.3 Botanical approaches to pigmentation and skin appearance: Botanical products have been investigated for hyperpigmentation and melasma. A

systematic review found that several botanically derived agents were promising, but relatively few studies were methodologically rigorous.[15] A later systematic review and meta-analysis of randomized controlled trials reported improvement in melasma outcomes with topical botanical products and generally favourable tolerability, while emphasizing variation among products and the need for further well-designed trials.[16]

2.4 Acne and topical masks

Herbal medicines have also been evaluated for acne vulgaris. A systematic review of clinical trials found promising effects of several herbal interventions on inflammatory and non-inflammatory lesions, while noting the need for better-quality evidence and standardized methodologies.[17] Current acne guidelines emphasize evidence-based assessment and management of acne severity.[18] A 2023 clinical study of a clay mask in oily and acne-prone skin reported reductions in oiliness and acne-related measures with regular use, providing relevant support for further investigation of absorbent mask-based approaches.[19]

2.5 Sandalwood and citrus-derived ingredients

Sandalwood album oil has been studied as a botanical dermatological therapeutic and has demonstrated anti-inflammatory and antimicrobial activity in preclinical and clinical research, with investigations in acne and other skin disorders.[20] Citrus peels contain phenolic compounds, flavanones and polymethoxylated flavones with antioxidant activity.[21] Experimental work with *Citrus reticulata* peel has also reported antioxidant and anti-collagenase/anti-elastase activities relevant to anti-aging skin-care formulations.[22]

2.6 Antioxidants, skin aging and barrier function

Oxidative stress is an important component of extrinsic skin aging, and topical antioxidants have been investigated for reducing oxidative and UV-related skin damage.[3-6] Botanical compounds have also been reviewed as potential anti-aging agents, although the clinical evidence has often been limited by small sample sizes and methodological weaknesses.[24] Maintaining skin-barrier integrity

and adequate hydration is important for healthy skin and for reducing dryness and irritation.[25-28]

Overall, the literature supports continued investigation of plant-derived topical formulations, but it also indicates that evidence for individual ingredients cannot automatically establish efficacy of a multi-ingredient facepack. This provides a rationale for evaluating the present formulation as a whole.

3. Aim

To evaluate the efficacy and tolerability of a polyherbal facepack blend for improving selected skin-care parameters.

4. Objectives

- To assess the effect of the herbal facepack on common skin-care concerns.
- To evaluate improvement in acne/breakouts, blackheads/whiteheads and pigmentation-related concerns.
- To assess changes in skin tone, dullness and hydration.
- To observe its effect on fine lines/wrinkles, redness/inflammation and open pores.
- To assess its effect on excessive oiliness or dryness.
- To observe the tolerability and occurrence of any adverse skin reactions during the study period.

5. Materials and Methods

5.1 Study Design

The present study was designed as an observational interventional study evaluating the clinical response to a polyherbal facepack formulation.

5.2 Study Setting

The study was conducted at ZVM Unani Medical College & Hospital, Camp, Pune, Maharashtra, India.

5.3 Study Participants

A total of 100 participants were included in the study. Both male and female participants were included, with an age range of 15–50 years.

5.4 Study Duration

The intervention was administered for four consecutive weeks, with application of the facepack three times per week.

5.5 Ethical Approval

The study was conducted following institutional ethical requirements. Ethical approval was obtained

from the Institutional Ethics Committee with reference number EC/MCES/1044/2025. Date of ethical approval: 09 April 2025. The study was conducted in accordance with applicable ethical principles for research involving human participants and the principles of the Declaration of Helsinki and its subsequent amendments.

5.7 Herbal Facepack Formulation

S. No.	Ingredient	Percentage
1	Neem	5%
2	Turmeric	5%
3	Sandalwood	10%
4	Beetroot	10%
5	Multani mitti	50%
6	Saad kufi	10%
7	Orange peel	5%
8	Lemon peel	5%
	Total	100%

The ingredients were incorporated into a single polyherbal facepack formulation according to the study protocol.

5.8 Intervention

Participants were instructed to apply the prepared facepack to the facial skin three times per week for four consecutive weeks. The participants were observed for clinical response and tolerability during the intervention period. Any symptoms or adverse reactions reported during the study were documented.

5.9 Assessment Parameters

The clinical response was evaluated using the following predefined skin-care parameters: acne/breakouts; blackheads/whiteheads; hyperpigmentation; dark spots; uneven skin tone; dullness; dehydration; fine lines/wrinkles; redness/inflammation; open pores; and excessive oiliness/dryness. The overall response was categorized as Improved, Moderately improved, or No improvement.

5.10 Safety and Tolerability Assessment

Participants were observed for local tolerability throughout the intervention. The formulation was generally well tolerated. Some participants with dehydrated skin experienced increased dryness or itching. No major adverse event was reported during the study period.

6. Results

A total of 100 participants aged 15–50 years were included in the present observational interventional study. The participants received the formulated herbal facepack three times per week for four consecutive weeks. The clinical response was assessed using predefined skin-care parameters, including acne/breakouts, blackheads/whiteheads, hyperpigmentation, dark spots, uneven skin tone, dullness, dehydration, fine lines/wrinkles, redness/inflammation, open pores, and excessive oiliness/dryness.

At the end of the intervention period, 80 participants (80.0%) demonstrated overall clinical improvement, 18 participants (18.0%) demonstrated moderate improvement, and 2 participants (2.0%) showed no appreciable improvement. Thus, 98 of 100 participants (98.0%) demonstrated at least some degree of clinical improvement, whereas only 2.0% were classified as non-responders.

The overall distribution indicates a predominantly favourable clinical response. The 80.0% improvement rate corresponds to four out of every five participants, while the additional 18.0% moderate-improvement category indicates a further clinically beneficial response of lesser magnitude. The difference between the proportion showing any improvement (98%) and the proportion showing no improvement (2%) was 96 percentage points.

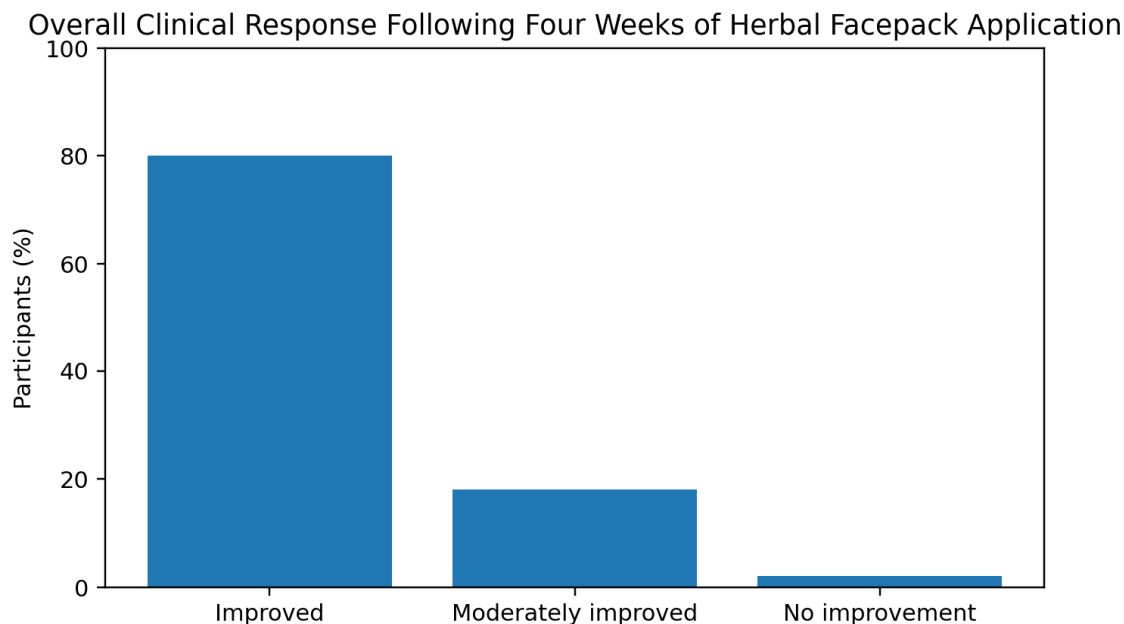


Figure 1. Overall clinical response of participants following four weeks of herbal facepack application.

Clinical response	Number of participants (n)	Percentage (%)	95% CI
Improved	80	80.0	70.9–87.3
Moderately improved	18	18.0	11.0–27.0
No improvement	2	2.0	0.2–7.0
Total	100	100.0	—

The estimated proportion of participants showing improvement was 0.80, with an approximate 95% confidence interval (CI) of 70.9%–87.3%. The corresponding 95% CIs for moderate improvement and no improvement were approximately 11.0%–27.0% and 0.2%–7.0%, respectively. These intervals describe the precision of the observed proportions in the study population.

6.1 Parameter-wise Assessment of Skin-related Clinical Outcomes

S. No.	Clinical parameter assessed	Assessment criteria
1	Acne/breakouts	Reduction in frequency and apparent severity of acne lesions/breakouts
2	Blackheads/whiteheads	Reduction in visible open and closed comedonal lesions
3	Hyperpigmentation	Reduction in intensity or extent of hyperpigmented areas
4	Dark spots	Reduction in visibility and intensity of localized dark spots
5	Uneven skin tone	Improvement in uniformity of facial complexion
6	Dullness	Improvement in skin brightness and overall radiance
7	Dehydration	Reduction in roughness and visible dryness with better hydrated appearance
8	Fine lines/wrinkles	Reduction in apparent prominence of superficial fine lines

		and wrinkles
9	Redness/inflammation	Reduction in visible erythema and inflammatory appearance
10	Open pores	Reduction in apparent visibility of enlarged pores
11	Excessive oiliness/dryness	Improved balance of excessive sebum or dryness

The clinical assessment incorporated multiple skin-related domains rather than a single outcome. For acne and breakouts, a favourable response was defined by reduction in visible lesions and their apparent severity. For blackheads and whiteheads, reduction in the number or prominence of comedonal lesions was considered improvement. Hyperpigmentation and dark spots were assessed according to changes in intensity and visibility, whereas improvement in uneven skin tone and dullness was reflected by greater uniformity and radiance of the complexion.

For dehydration and dryness, improvement represented a reduction in roughness and visible dryness with a better hydrated appearance. Fine lines and wrinkles were assessed according to their apparent prominence. Redness/inflammation was assessed by visible erythema and inflammatory appearance, while open pores were assessed by their apparent visibility. Excessive oiliness/dryness was considered improved when a more balanced skin appearance was observed.

6.2 Statistical Interpretation

The present analysis is primarily descriptive because the available study results are expressed as aggregate categorical outcomes. Accordingly, frequencies, percentages and approximate 95% confidence intervals are reported. The observed improvement proportion was 80.0%, while 98.0% of participants demonstrated at least some degree of clinical improvement when the improved and moderately improved categories were combined.

The magnitude of the observed response is clinically notable; however, statistical significance should not be inferred solely from the observed percentages. Participant-level pre-intervention and post-intervention scores would be required to calculate mean change, standard deviation, effect size and parameter-specific p-values. For normally distributed

paired continuous outcomes, a paired Student's t-test would be appropriate; for non-normally distributed paired data, the Wilcoxon signed-rank test could be used. Categorical outcomes may be analysed using the chi-square test or Fisher's exact test, as appropriate.

The formulation was generally well tolerated during the study. No major adverse event was reported. Some participants with pre-existing or pronounced skin dehydration experienced dryness or itching, suggesting that baseline skin hydration and individual skin characteristics may influence tolerability.

Overall, the findings demonstrate a predominantly favourable clinical response to the herbal facepack, with 80.0% of participants classified as improved and a further 18.0% classified as moderately improved. The cumulative proportion showing any degree of improvement was therefore 98.0%, while only 2.0% showed no improvement. These findings provide preliminary clinical evidence supporting further evaluation of the formulation; however, because the study did not include a separate control group and the available outcome data are aggregate, causal efficacy and statistical significance cannot be established conclusively from these results alone.

7. Discussion

The present study evaluated a polyherbal facepack containing eight herbal/natural ingredients and assessed its effects on a range of commonly encountered skin-care concerns. The overall findings showed that 80% of participants improved, 18% showed moderate improvement and 2% showed no improvement after four weeks of application.

The observed response may be related to the complementary properties of the ingredients included in the formulation. Herbal ingredients such as neem and turmeric have traditionally been used in skin care and have been investigated for their pharmacological activities.[7-13] Turmeric is particularly relevant

because curcumin has demonstrated antioxidant and anti-inflammatory activities, and clinical literature has investigated topical turmeric/curcumin preparations in various dermatological conditions.[7-11]

Sandalwood has also been investigated as a topical botanical therapeutic, with reported anti-inflammatory and antimicrobial activities and clinical investigation in acne and other dermatological conditions.[20] Citrus peels contain phenolic and flavonoid compounds with antioxidant activity, and experimental work with citrus peel has reported anti-aging-related antioxidant and enzyme-inhibitory activities.[21,22] These findings provide biological rationale for studying such ingredients in topical formulations, but they do not establish that each ingredient independently caused the clinical response observed in this study.

Multani mitti is commonly used in topical cosmetic preparations as an absorbent material. Evidence from a clinical clay-mask study supports the potential relevance of absorbent mask formulations for oily and acne-prone skin, although the present formulation differs in composition and therefore requires its own clinical evaluation.[19] The inclusion of beetroot is also consistent with the broader use of plant-derived materials in cosmetic formulations; contemporary reviews describe *Beta vulgaris* among plants used as natural coloring/cosmetic ingredients.[23]

The improvement observed in the majority of participants is encouraging; however, the findings should be interpreted cautiously. Botanical dermatology literature repeatedly emphasizes that promising mechanistic or preliminary clinical findings do not substitute for adequately controlled trials.[14-18,24] Since the study did not include a separate control group, the observed improvement cannot be attributed exclusively to the facepack with the same level of certainty possible in a randomized controlled trial. In addition, subjective assessment of cosmetic skin parameters may introduce observer or participant bias.

The finding of increased dryness or itching in some dehydrated participants is also clinically relevant. Skin-barrier literature emphasizes the importance of

maintaining stratum-corneum integrity and adequate hydration, and barrier disruption can be associated with dryness, irritation and altered skin function.[25-28] This highlights the importance of participant counselling and monitoring when using topical herbal preparations.

The present study therefore provides preliminary clinical evidence supporting further investigation of the formulation. Future studies should incorporate standardized objective assessment tools, validated dermatological scoring systems, transparent formulation details, control groups and longer follow-up periods.[30] Such studies would also help determine the individual contribution of each ingredient and the reproducibility of the observed response.

8. Limitations

- The present study did not include a separate control group; therefore, the observed improvement cannot be conclusively attributed to the intervention alone.
- The intervention period was limited to four weeks, which may not be sufficient to assess long-term effects or sustained improvement in all skin parameters.
- The assessment included multiple clinical and cosmetic parameters, some of which may involve subjective evaluation. Objective measurements using validated dermatological assessment tools would strengthen future research.
- The study sample consisted of 100 participants from a single institutional setting, which may limit the generalizability of the findings.
- Further studies are required to investigate the individual contribution of each ingredient, formulation stability, standardization of active phytoconstituents and long-term safety.

9. Conclusion

The present study suggests that the investigated polyherbal facepack may be beneficial in improving several common skin-care concerns. Among 100 participants, 80% demonstrated improvement, 18% demonstrated moderate improvement and 2%

demonstrated no improvement following four weeks of intervention.

The formulation was generally well tolerated, although increased dryness or itching was observed in some participants with dehydrated skin.

These preliminary findings support further scientific evaluation of polyherbal facepack formulations as a potential phytotherapeutic approach to skin care. Future randomized controlled studies with larger sample sizes, objective outcome measures, standardized formulations and longer follow-up are recommended.

10. Conflict of Interest

The authors declare that there is no conflict of interest related to the present study.

11. Funding

This research was conducted under the Short-Term Research Grant (STRG) supported by Maharashtra University of Health Sciences (MUHS). Grant support: ₹8,000. Application No.: 2504000808. PRN No.: CBB0120210276. The funding agency had no role in the study design, data collection, analysis, interpretation, manuscript preparation or decision to submit the manuscript.

12. Acknowledgement

The authors express their sincere gratitude to the management, faculty members and staff of ZVM Unani Medical College & Hospital, Camp, Pune, for their support and cooperation.

The authors are especially grateful to Dr. Jaleel, Vice Principal, for his encouragement and guidance.

The authors also acknowledge the support and encouragement received from friends and colleagues, particularly Mahwish Buland, Nauman SK, Musfera, Anam Fatima, Saba Anjum, Laiba, Sanober, Sabreen and Ismat.

13. Ethical Statement

The study received approval from the Institutional Ethics Committee, ZVM Unani Medical College & Hospital, Pune, under reference number EC/MCES/1044/2025, dated 09 April 2025. The

study was conducted in accordance with applicable ethical standards for research involving human participants and the principles of the Declaration of Helsinki and its later amendments.

14. Use of Artificial Intelligence: The authors declare that no generative artificial intelligence tools were used to generate, analyze, or interpret the scientific data or to make scientific conclusions presented in this manuscript. Any language editing was performed by the authors.

15. References

1. Proksch E, Brandner JM, Jensen JM. The skin: an indispensable barrier. *Exp Dermatol*. 2008;17(12):1063-1072. doi:10.1111/j.1600-0625.2008.00786.x.
2. Del Rosso JQ, Levin J. The clinical relevance of maintaining the functional integrity of the stratum corneum in both healthy and disease-affected skin. *J Clin Aesthet Dermatol*. 2011;4(9):22-42.
3. Masaki H. Role of antioxidants in the skin: anti-aging effects. *J Dermatol Sci*. 2010;58(2):85-90. doi:10.1016/j.jdermsci.2010.03.003.
4. Kammeyer A, Luiten RM. Oxidation events and skin aging. *Ageing Res Rev*. 2015;21:16-29. doi:10.1016/j.arr.2015.01.001.
5. Pinnell SR. Cutaneous photodamage, oxidative stress, and topical antioxidant protection. *J Am Acad Dermatol*. 2003;48(1):1-19. doi:10.1067/mjd.2003.16.
6. Oresajo C, Pillai S, Manco M, Yatskayer M, McDaniel D. Antioxidants and the skin: understanding formulation and efficacy. *Dermatol Ther*. 2012;25(3):252-259. doi:10.1111/j.1529-8019.2012.01505.x.
7. Vaughn AR, Branum A, Sivamani RK. Effects of turmeric (*Curcuma longa*) on skin health: a systematic review of the clinical evidence. *Phytother Res*. 2016;30(8):1243-1264. doi:10.1002/ptr.5640.
8. Vollono L, Falconi M, Gaziano R, Iacovelli F, Dika E, Terracciano C, et al. Potential of

- curcumin in skin disorders. *Nutrients*. 2019;11(9):2169. doi:10.3390/nu11092169.
9. Barbalho SM, de Sousa Gonzaga HF, de Souza G, de Alvares Goulart R, de Sousa Gonzaga ML, de Alvarez Rezende B. Dermatological effects of Curcuma species: a systematic review. *Clin Exp Dermatol*. 2021;46(5):825-833. doi:10.1111/ced.14584.
 10. Mo Z, Yuan J, Guan X, Peng J. Advancements in dermatological applications of curcumin: clinical efficacy and mechanistic insights in the management of skin disorders. *Clin Cosmet Investig Dermatol*. 2024;17:1083-1092. doi:10.2147/CCID.S467442.
 11. Oresajo C, Stephens T, Hino PD, Law RM, Yatskayer M, Foltis P, et al. Protective effects of a topical antioxidant mixture containing vitamin C, ferulic acid, and phloretin against ultraviolet-induced photodamage in human skin. *J Cosmet Dermatol*. 2008;7(4):290-297. doi:10.1111/j.1473-2165.2008.00408.x.
 12. Gopinath H, Karthikeyan K. Neem in dermatology: shedding light on the traditional panacea. *Indian J Dermatol*. 2021;66(6):706. doi:10.4103/ijd.ijd_562_21.
 13. Singh V, Roy M, Garg N, Kumar A, Arora S, Malik DS. An insight into the dermatological applications of neem: a review on traditional and modern aspect. *Recent Adv Antiinfect Drug Discov*. 2021;16(2):94-121. doi:10.2174/2772434416666210604105251.
 14. Reuter J, Merfort I, Schempp CM. Botanicals in dermatology: an evidence-based review. *Am J Clin Dermatol*. 2010;11(4):247-267. doi:10.2165/11533220-000000000-00000.
 15. Fisk WA, Agbai O, Lev-Tov HA, Sivamani RK. The use of botanically derived agents for hyperpigmentation: a systematic review. *J Am Acad Dermatol*. 2014;70(2):352-365. doi:10.1016/j.jaad.2013.09.048.
 16. Wang T, Wang Y, Wang J, Chen H, Qu B, Li Z. Efficacy and safety of topical therapy with botanical products for melasma: a systematic review and meta-analysis of randomized controlled trials. *Front Med (Lausanne)*. 2022;8:797890. doi:10.3389/fmed.2021.797890.
 17. Proença AC, Luís Â, Duarte AP. The role of herbal medicine in the treatment of acne vulgaris: a systematic review of clinical trials. *Evid Based Complement Alternat Med*. 2022;2022:2011945. doi:10.1155/2022/2011945.
 18. Zaenglein AL, Pathy AL, Schlosser BJ, Alikhan A, Baldwin HE, Berson DS, et al. Guidelines of care for the management of acne vulgaris. *J Am Acad Dermatol*. 2016;74(5):945-973.e33. doi:10.1016/j.jaad.2015.12.037.
 19. Zhang X, Zhang Z, Tao H, He X, Hsu K, Wang W, et al. Comprehensive assessment of the efficacy and safety of a clay mask in oily and acne skin. *Skin Res Technol*. 2023;29(11):e13513. doi:10.1111/srt.13513.
 20. Moy RL, Levenson C. Sandalwood album oil as a botanical therapeutic in dermatology. *J Clin Aesthet Dermatol*. 2017;10(10):34-39.
 21. Singh B, Singh JP, Kaur A, Singh N. Phenolic composition, antioxidant potential and health benefits of citrus peel. *Food Res Int*. 2020;132:109114. doi:10.1016/j.foodres.2020.109114.
 22. Apraj VD, Pandita NS. Evaluation of skin anti-aging potential of Citrus reticulata Blanco peel. *Pharmacognosy Res*. 2016;8(3):160-168. doi:10.4103/0974-8490.182913.
 23. Michalak M. Plant extracts as skin care and therapeutic agents. *Int J Mol Sci*. 2023;24(20):15444. doi:10.3390/ijms242015444.
 24. Hunt KJ, Hung SK, Ernst E. Botanical extracts as anti-aging preparations for the skin: a systematic review. *Drugs Aging*. 2010;27(12):973-985. doi:10.2165/11584420-000000000-00000.
 25. Purnamawati S, Indrastuti N, Danarti R, Saefudin T. The role of moisturizers in addressing various kinds of dermatitis: a review. *Clin Med Res*. 2017;15(3-4):75-87. doi:10.3121/cmr.2017.1363.
 26. Rajkumar J, Chandan N, Lio P, Shi V. The skin barrier and moisturization: function, disruption,

- and mechanisms of repair. *Skin Pharmacol Physiol.* 2023;36(4):174-185. doi:10.1159/000534136.
27. Madnani N, Deo J, Dalal K, Benjamin B, Murthy VV, Hegde R, et al. Revitalizing the skin: exploring the role of barrier repair moisturizers. *J Cosmet Dermatol.* 2024;23(5):1533-1540. doi:10.1111/jocd.16171.
 28. Katiyar SK, Elmets CA. Green tea polyphenolic antioxidants and skin photoprotection. *Int J Oncol.* 2001;18(6):1307-1313. doi:10.3892/ijo.18.6.1307.
 29. Mukherjee PK, Maity N, Nema NK, Sarkar BK. Bioactive compounds from natural resources against skin aging. *Phytomedicine.* 2011;19(1):64-73. doi:10.1016/j.phymed.2011.10.003.
 30. Siegel DM, Jakus J, Hooper D. Topical natural products in managing dermatologic conditions: observations and recommendations. *Cutis.* 2019;103(4):233-236;E1-E2.