



The Relationship Between Using Green Tea in Preventing Skin Aging : A Literature Review

Febby Pebrianti^{1*}, Ummi Malikal Balqis²

1. Undergraduate Nursing Study Program, Faculty of Nursing, STIKes Permata Nusantara
2. Nursing Study Program, Faculty of Nursing, STIKes Permata Nusantara

*Correspondence: Febby Pebrianti | STIKes Permata Nusantara | febbypebrianti2002@gmail.com

Abstract

Introduction: Aging is a natural biological process in humans. Skin aging can be caused by both intrinsic and extrinsic factors. These factors lead to visible signs of aging, such as facial wrinkles, reduced elasticity, and changes in skin texture. Extrinsic aging is associated with environmental factors and is characterized by thinning of the epidermis and fine lines. In contrast, intrinsic aging, which is primarily caused by sun exposure, is marked by deep wrinkles, sagging skin, and hyperpigmentation. Flavonoids in green tea play a role in reducing free radicals, which are one of the main triggers of skin aging.

Method: This study used a literature review method based on selected articles discussing the relationship between green tea and skin aging prevention.

Results: The review identified three main themes from the selected articles, indicating that green tea has a positive effect in preventing skin aging.

Conclusion: Based on the literature review, it can be concluded that green tea has beneficial effects in preventing skin aging. The antioxidant content, particularly flavonoids, helps reduce the impact of free radicals, which are major contributors to the aging process. Therefore, green tea can be considered a natural option to support skin health and delay visible signs of aging.

Keywords: Aging, Green tea, Prevention, Skin

Received April 17, 2025; Received in revised form April 19, 2025; Accepted April 19, 2025; Available online April 21, 2025

INTRODUCTION

The entire body is covered by the outermost part called skin. The role of the skin is to protect the underlying organs from external stimulation or disturbance and is a place for sweat to come out. Each individual's skin type is different, including activities, temperature and humidity, frequent exposure to air pollution, frequent activities outside so the skin is exposed to sunlight, water intake and types of food frequently consumed (Rahmawaty, 2020). Nowadays, skin care is very popular. At the moment there are many types of skincare being sold on the market, which have various functions, both for dry skin or dry skin, oily skin or oily skin, dull skin or dull skin, acne skin or acne prone skin and even for preventing aging, on the skin. Skin care is popular with both young and old, skin care today is not only for women but there are many skin care products for men.

In Indonesia there are many types of plants, there are more than 28,000 plant species in Indonesia which have many benefits. In Indonesia there are also many plants that have medicinal benefits, the efficacy of which can be accounted for. One of the plants that has benefits is *Camellia Sinesis L* or commonly known as Green Tea (Widyaningrum, 2015). Green tea is a plant that contains many natural ingredients, which function as an antidote to free radicals. This composition contains polyphenols such as epicatechin, epigallocatechin, epicatechin-3-gallate and epigallocatechin-gallate (EGCG). Research shows that oral and topical preparations with similar effects can be made from green tea polyphenols (Noviani, 2022) research conducted by (sundari, 2009) The quality of green tea is influenced by three parts. The parts that influence it are tannin, caffeine and polyphenols. A large part of Green Tea contains biochemical bonds called polyphenols. Green tea has a high antioxidant content, antioxidants have anti-aging uses which can be formulated in skincare.

Older people's skin is different from when they were young. There are two types of factors that cause skin aging, namely intrinsic and extrinsic factors, namely, aging of the skin usually results in fine wrinkles,

decreased skin elasticity, and skin texture that has changed. Extrinsic factors occur with age and are characterized by fine lines and thinning of the epidermis. In contrast, intrinsic factor is characterized by deep wrinkles, sagging skin, and hyperpigmentation and is primarily caused by sun exposure. (Flora Ramona Sigit Prakoeswa, 2022). Exposure to air pollution cannot be avoided by human skin in daily life, exposure to sunlight and the use of chemicals can cause premature aging due to the influence of free radicals. Skincare that uses antiaging contains antioxidants whose function is to protect the skin from free radicals (Wardani, 2022).

Prevention Aging of the skin can be prevented by adopting healthy living habits and using skincare containing antioxidants. Green tea contains polyphenols which are useful for preventing nitrogen oxide and hydrogen peroxide which have the role of free radicals, also preventing the decline in the enzymes catalase, glutathione peroxidase, superoxide dismutase and glutathione which cause exposure to UVB, preventing oxidation and lipid peroxidation caused by UVB. prevents DNA damage, activates DNA repair enzymes, prevents tumors and much more (Patricia OyetakanWhite, 2012).

From this research, to find out the relationship between using green tea in preventing skin aging, I will research using the literature review method to find out the relationship between using green tea in preventing skin aging.

METHOD

Literature review, also known as literature review, is research and literature searches conducted to write articles on a particular subject or topic. The source of information for this article comes from literature found on the internet, including research articles relating to the relationship between the use of Green Tea in preventing skin aging. The search term "Green Tea, Skin Aging" was used to perform an internet search, provided by search engines such as Pubmed and Google Scholar. This data was collected on February 19, 2024.

RESULTS

The search results showed that 12 articles that were deemed to be commensurate with the research objectives had been combined into one, and then checked to find out whether the titles of the articles were the same or not. Of the 7 articles that had the same title, 5 of them were then investigated according to the inclusion and exclusion criteria for evaluation. The following table shows the literature search methods mentioned previously.

Table 1. Literature Search Strategy

Search Engine	Google Scholar	PubMed
Search Results	738	12
Fulltext, pdf,	12	4
Appropriate title	3	2
Same title	3	2
Eligible according to inclusion criteria and exclusion	3	2
Results		5

The five articles can be categorized as good (high) articles after the study quality assessment is completed. Next, the author extracted data from five selected articles. Author's name, year, title, aim, research method, and research results were used to extract data. Table 2 shows the extraction data.

Table 2. Data Extraction Results

No	Author & Year	Article Title	Journal Name	Objective Study	Method Study	Results
1.	(Mahmood, 2010)	Formulation and Evaluation of Tea Leaf (Camellia sinensis (L.) Kuntze) with a Combination of Emulgators	and (Pharmaceutical Green Journal Indonesia)	To find out physical properties of the cream are affected by the use of a combination of stearic acid	Experimental the laboratorium	Shows that green tea preparation as a cream is the best formulation.

			and triethanolamine as an emulsifier and to find the best green tea leaf ethanol extract cream formula.		
2.	(Mahmood, 2013)	Combined Application of Lotus and Green Tea improves Facial Skin Surface Parameter	Topical REJUVENATION RESEARCH	to find out the Plasebo effects of controlled, split green tea and face, lotus extract monocentric or a study combination of both on skin parameters in placebo-controlled, split face, and monocentric studies	There was a significant effect on the administration of green tea, lotus extract, and the combination of green tea and lotus, but the administration of the combination of green tea and lotus was more significant than in the other groups.
3.	(dina, 2020)	FORMULATION AND PHYSICAL QUALITY TESTING OF BODY SCRUB PREPARATIONS OF GREEN TEA POWDER (Camellia sinensis L.)	INDONESIAN PHARMACY JOURNAL	This research aims to develop a green tea powder formulation as a physically stable body cleansing product.	Experimental labolatorium functions to remove dead skin cells, but only products stored in the refrigerator can be physically tested.
4.	(Hong, 2013)	Tannase=converted green tea catechins and their anti-wrinkle activity in human.	Journal Cosmetic Dermatology	ofto study how topical green teatannase extract affects skin wrinkles	Randomized controlled trial has anti-wrinkle and free radical scavenging properties.
5.	(Amellya Cahya Margareta, 2023)	Potential of Green Tea Dregs Extract as Natural Antioxidants in Cleansing Preparations Face	JUSTEK: JOURNAL OF SCIENCE AND TECHNOLOGY	The aim of this research is to find out how effective green dregs extract is as the main ingredient in facial cleansing toner. and how effective this product can be as a new skin care method.	The results of this research are that green tea dregs extract has a significant potential as an ingredient in facial cleansing toner preparations with the best antioxidant results.

DISCUSSION

As a result of the analysis carried out on five articles, it was found that green tea influences the prevention of skin aging. Several themes discussed by participants were related to the processing of green tea extract, namely green tea as cream, green tea as a scrub and green tea as a toner.

The first theme is the use of green tea extract for cream, so green tea can be easily applied to the skin and can be made into a cream preparation. The advantage of cream lies in its use. cream is a topical medication

that is applied to the skin and has the ability to deliver topical medication (Tanesh Sahu, 2016). Cream has many advantages, including easy to use, fast, comfortable, painless, and can prevent drug doses from changing. Green tea (*Camellia sinensis* (L.) L.) is a type of plant that contains bioactive ingredients that have various benefits, including sun protection, antioxidant, anti-inflammatory and anti-carcinogen (Patricia OyetakinWhite, 2012) and anti-aging skin (Puxvadee Chaikul1, 2020). Polyphenols are bioactive ingredients, accounting for 25–35% of the dry weight of tea leaves (Fahrauk Faramayuda*, 2010) One of the polyphenols found in Epicatechin (EC), epigallocatechin (EGC), epicatechin gallate (ECG), and epigallocatechin gallate (EGCG) is a component of green tea leaves.(Patricia OyetakinWhite, 2012). The polyphenols found in green tea leaves have the ability to stop the process of melanogenesis, which means that the skin will not produce more melanin.(Puspitasari, 2017)

The second theme is the use of green tea extract for scrubs. The chemical compounds in green tea powder (*Camellia sinensis* L.) Act as antioxidants, protecting the skin from free radicals which cause premature aging. Therefore, developing a body scrub preparation from green tea powder is considered important because the active substances contained in it can be better used to remove dead skin cells. Scrubs are currently available in various forms, including powder and cream. Scrub cream can be used directly without being mixed with water, which makes it easier and more efficient. Micellar water is a type of cleanser, but it is less effective because slippery skin cannot remove dead skin cells. To remove dead skin cells, a scrub is needed, a rather rough material (Tranggono, 2007).

The third theme is the use of green tea dregs extract in the preparation of facial cleansing toner. Green tea dregs extract is an innovative formulation involving green tea dregs extract in a toner preparation that can become an attraction for the skin care industry which continues to grow. The active component in green tea is that epigallocatechin gallate (EGCG) has been identified as one of the main polyphenols of green tea which has anti-inflammatory and antioxidant properties. Application of green tea in skin care products. Several leading skin care products have included green tea extract as the main ingredient, recognizing its benefits in maintain healthy skin. Green tea dregs extract has significant potential as an ingredient in facial cleansing toner preparations with the best antioxidant results, green tea dregs extract, providing the strongest antioxidant effect compared to other formulations tested in this study.

CONCLUSION

Green tea has many ingredients, one of which is high in antioxidants. Anti-oxidants are ingredients that can prevent skin aging. The elderly have a greater risk of developing wrinkles on the face. The use of green tea extract can be processed into various skincare preparations. Using skincare made from green tea can prevent aging in the skin of the elderly. This is in line with research from 5 extracted articles that there is a significant influence on the use of green tea extract.

REFERENCE

- Amellya, C. M. (2023). Potensi ekstrak ampas teh hijau (green tea) sebagai antioksidan alami dalam sediaan toner pembersih wajah. *Justek: Jurnal Sains dan Teknologi*, 3(2), 536–543.
- Dina, V. P. (2020). Formulasi dan uji mutu fisik sediaan body scrub serbuk teh hijau (*Camellia sinensis* L.). *Jurnal Farmasi Indonesia Afamedis*, 1(1), 64–79.
- Fahrauk Faramayuda, F. A. (2010). Formulation of antioxidant lotion containing water extract of green tea leaf (*Camellia sinensis* L.). *Majalah Obat Tradisional*, 15(2), 105–113.
- Hong, Y.-H. (2013). Tannase-converted green tea catechins and their anti-wrinkle activity in humans. *Journal of Cosmetic Dermatology*, 12(2), 137–143.
- Mahmood, T. (2010). Changes in skin mechanical properties after long-term application of cream containing green tea extract. *Aging Clinical and Experimental Research*, 22(5–6), 333–336.
- Mahmood, T. (2013). Combined topical application of lotus and green tea improves facial skin surface parameters. *Rejuvenation Research*, 16(1), 91–97.
- Noviani, D. (2022). Peran pemberian teh hijau dalam penuaan kulit. *Bandung Conference Series: Medical Science*, 1(2), 795–801.
- Oyetakin-White, P. (2012). Protective mechanisms of green tea polyphenols in skin. *Oxidative Medicine and Cellular Longevity*, 2012, 1–8. <https://doi.org/10.1155/2012/560682>
- Patricia Oyetakin-White, P., & Hirota, H. (2012). Protective mechanisms of green tea polyphenols in skin. *Oxidative Medicine and Cellular Longevity*, 2012, 1–8.
- Puspitasari, P. (2017). Krim ekstrak teh hijau 20% (*Camellia sinensis*) mencegah peningkatan jumlah melanin sama efektif dengan krim hidrokuinon 4% pada kulit marmut (*Cavia porcellus*) yang dipajan sinar ultraviolet B. *Jurnal Biomedik (JBM)*, 9(2), 101–106.

- Puxvadee, C., & Tapaamordech, S. (2020). Anti-skin aging activities of green tea (*Camellia sinensis* (L.) Kuntze) in B16F10 melanoma cells and human skin fibroblasts. *Journal Pre-Proof*, 1–26.
- Rahmawaty, A. (2020). Peran perawatan kulit (skincare) yang dapat merawat atau merusak *skin barrier*. *Artikel Penyegar*, 5, 5–10.
- Ramona Sigit Prakoeswa, F. W. A. (2022). Penuaan kulit dan terapi yang aman bagi geriatri: Artikel review. *Jurnal Sains dan Kesehatan*, 4(3), 557–568.
- Sahu, T. S., & Patel, T. (2016). Skin cream as topical drug delivery system: A review. *Journal of Pharmaceutical and Biological Sciences*, 11(3), 149–154.
- Sundari, D. (2009). Toksisitas akut (LD50) uji gelagat ekstrak daun teh hijau (*Camellia sinensis*) pada mencit. *Media Penelitian dan Pengembangan Kesehatan*, 19(3), 123–129.
- Tranggono, R. I. (2007). *Buku pegangan ilmu pengetahuan kosmetik*. Jakarta: PT Gramedia Pustaka Utama.
- Wardani, T. S. (2022). Kombinasi ekstrak krokot dan teh hijau sebagai serum anti-aging dalam sediaan *spray gel* dengan metode FRAP. *Jurnal Delima Harapan*, 3(2), 51–58.
- Widyaningrum, N. (2015). Aktivitas antibakteri formula opium krim antiacne fraksi etil asetat ekstrak daun teh hijau. *Prosiding Seminar Nasional Peluang Herbal Sebagai Alternatif Medicine*, 141–146.