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A REVIEW ON NUTRACEUTICAL IMPACT ON HEALTH CARE

[1]Bhagyashri Raju Danve, [2]Prachi Sambhaji Umbarkar, [3]Sonali Lalgir Giri.
[4]Mr. Vishnu D. Ragde.

[1]Raosaheb Patil Danve College of Pharmacy, Badnapur. - Bhagyashri Raju Danve
[2] Raosaheb Patil Danve College of Pharmacy, Badnapur - Prachi Sambhaji Umbarkar
[3] Raosaheb Patil Danve College of Pharmacy, Badnapur. - Sonali Lalgir Giri.
[4] Raosaheb Patil Danve College of Pharmacy, Badnapur. - Assistant Professor.

Abstract:

The medicinal herb Nigella sativa of the Ranunculaceae family is utilized extensively all over the world. It is widely used in several conventional medical systems, including Unani, Ayurveda, and Siddha. Folklore has long used seeds and oil in a variety of food and medical systems. Numerous illnesses and disorders have been treated with Nigella sativa seeds in the past.

*The seed Nigella sativa, sometimes referred to as black caraway and "**Kalonji**," is well-known throughout the world. It is one of the most widely used medicinal plants in the world, and its fixed oil includes a variety of beneficial chemical compounds, including thymoquinone, thymohydroquinone, Di thymoquinone, thymol, nigellicine, carvacrol, niguldipine, nigellicine, nigellidine, and alpha-hederin. Antioxidant, anti-inflammatory, antibacterial, antifungal, antiparasitic and antiprotozoal, antiviral, cytotoxic, anticancer, neuro-, gastro-, cardio-, hetapto-, and nephroprotective activities are just a few of the potential uses for Nigella sativa and its constituents, including some isolated compounds.*

This further reveals that the main bioactive component of the essential oil, thymoquinone, is responsible for the majority of the plant's medicinal capabilities. The pharmacological properties of Nigella sativa for the treatment of acne vulgaris, vitiligo, atopic dermatitis, plaque psoriasis, and wound healing are reviewed in this article based on the most recent research.

Corresponding author:
Bhagyashri Raju Danve,
Raosaheb Patil Danve College of Pharmacy,
Badnapur. - Bhagyashri Raju Danve

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INTRODUCTION:

Neutraceutical was coined from nutrition and pharmaceutical in 1989 by Dr.stephen De felice USA Neutraceutical can be defined as food or nutrient which is addition to its nutrient value provides health benefits including promotion of health and prevention of disease most of disease such as cardiovascular disease diabetes cancer gastrointestinal disorder ,hypertention, pain killer The nutraceutical products are recognized not only for their health benefits to reduce the risk of cancer, heart diseases and other related ailments, but also to prevent or treat hypertension, high cholesterol, excessive diabetes, degeneration, cataracts, menopausal symptoms, insomnia, diminished memory.

Neutraceutical have been discovered to have a good impact on,cardiovascular system health as well as play a role in the prevention of infection and cancer" Different types of nutraceuticals are functional food, medical food, dietary supplements, dietary fibers, prebiotics, and probiotics.

Nutraceuticals provide multiple health benefits ranging from general well-being to treatment of chronic disease.

Nutraceutical improves health by enhancing nutrient absorption, increasing detoxification, and supporting microflora of gastrointestinal tract. Health benefits of nutraceuticals are due to their diverse chemical composition, which includes fatty acids, proteins, carbohydrates, phenolics, polyphenols, alkaloids, terpenoids, and polyolsflavonoids, fibers chromium calcium chestnut spirulina soy nutrient a tocopherol curcumin omega - 3 fatty acid tomato lycopene garlic green tea grapes seed ginsing. Being of natural origin, nutraceuticals are considered as safe for human consumption, but due to their intended medical use, nutraceuticals are also regulated by certain guidelines made for drugs. Limitations of nutraceuticals include their slow mode of action and lack of strict control over their quality and concentration of ingredient.

HISTORY

Father OF Nutraceuticals Dr Stephen de Felice {in 1989} Hippocrates (460377 BC), the father of modern medicine paved the foundation stone for modern day nutraceuticals through his epic statement "Let food be thy medicine and medicine be thy food". He was concept that specific food can also be the solution for the prevention/ treatment of a disease apart from drug moieties. Roman Physician Galen enforced trust in the expertise and knowledge base of his profession to design a the pioneer to bring forward the nd formulate diet regimen which would maintain health standards of the entire population. Early nineteenth century marked the initiation of nutrition research by François M on experimental evidences provoked the question that whe agendie. His research based ther foods devoid of nitrogen do provide nutrition. This modulated scientific minds to think beyond proteins, carbohydrates, fats, and minerals to achieve proper nutrition. This hypothesis was supported by experiments which pro on mice by Nicolai Lunin duced interesting results. He proved that certain component present in milk was essential for nutrition of mice which cannot proteins, carbohydrates, fats, and minerals. [3] This fact and similar research findings by several researchers be classified as ultimately led to the discovery of the vital nutrient vitamin. From the birth of human race we are depended on offerings of Mother Nature to manage our physiological dysfunctions. One such botanicals obtained from plants like Vinca Ros finding presents the ea and Taxus brevifolia which are used in cancer management till date. Ginseng has been another such traditional drug used as chemotherapeutic even today but its history as herbal medicine in China is beyod 2000 years.[1]

ROLE OF *NUTRACEUTICALS* IN VARIOUS DISEASES:

Nutraceuticals play an important role in therapeutic areas such as arthritis, cancer, diabetes ingestion, cholesterol, blood pressure, pain killers, depression and various other disorder.

CLASSIFICATION OF *NUTRACEUTICAL*

They can be classified according to their chemical nature and therapeutic properties as follows…. •

CLASSIFICATION OF NUTRACEUTICALS:

1) MINERALS
2) ANTIOXDA
3)PUFAS
4) PROBIOTICS
5) PREBIOTICS
6) DIETARY FIBRE

Nigella sativa External Application

Nigella sativa has been used for centuries for the treatment of many skin conditions, for dermatological disorder, and in cosmeceutical formulations [26]. For example, it is used for acne vulgaris, burn, wounds, and injury treatment [26–28], anti-inflammatory for different kinds of skin inflammation [9, 29], and skin
pigmentation effect [30, 31].

Antimicrobial Effect

1.1. Antibacterial

New antimicrobial agents are intensively investigated due to pathogenic bacterial infections and microbial resistance, which have become a major health problem worldwide and this led to an increase in the use of medicinal plants [32]. Therefore, many studies discussed antibacterial efficacy of black seeds. Examples include thymoquinone, which is a part of black seeds oil, which is found to have bactericidal activity against most bacteria that was included in the study (MICs values ranged from 8 to 32 μg/ml), especially Gram-positive cocci types such as (Staphylococcus aureus ATCC 25923 and Staphylococcus epidermidis CIP106510). For Staphylococcus aureus, clear inhibition of the growth was found by concentration of 300 mg/ml with distilled water (DW) as control. 1.2. Antiviral: A few recent studies were found about the antiviral activity of Nigella sativa extract, for example, a recent study performed in 2013 obtained significant results about the effect of N. sativa oil against hepatitis C virus (HCV). Patients with HCV who cannot receive IFN-α were given 450 mg of N. sativa oil in capsular dosage form. After 3 months of treatment 3 times daily, a decrease in overall viral count was noted. An increase in antioxidant activity was also found, indicating a reduction in the hemolysis of red blood cells and platelet. Other findings were observed such as reduction in blood glucose levels and in the lower limb edema. [36].

These findings suggest that N. sativa administration will decrease viral load in patients with HCV and improve oxidant

Wound Healing

Thymoquinone is reported to prevent oxidative injury, act as antioxidant, and prevent membrane lipid peroxidation in tissues; these effects suggested the application of *Nigella sativa* topically to accelerate wound healing. A study on wound model rates was done to evaluate the wound healing effect of *N. sativa* oil. The results have shown that it increases the wounding process by unknown mechanism compared to silver sulfadiazine, which may be due to anti-inflammatory and immunomodulatory effects. In the future after further studies, we may use *N. sativa* oil instead of silver sulfadiazine to deal with wound.

Anti-Inflammatory

1. Psoriasis:

Psoriasis is common skin condition, which is a hyperproliferative, autoimmune skin disorder and can be itchy and painful. An experimental study was undertaken to see the effect of ethanol extract of *Nigella sativa* seeds in treatment of psoriasis**.** It was found that *N. sativa* increases the epidermal thickness when case study group is compared to control group that used traditional treatment.

2. Acne Vulgaris:

Acne vulgaris is one of the most prevalent human diseases, which is considered an infectious disease. Many researchers studied the effect of *Nigella sativa* oil against acne vulgaris. Hadi and Ashor (2010) noticed that using 20% of *N. sativa* oil extract in lotion formulation has a better efficacy and is less harmful than benzoyl peroxide lotion 5%, which is the basic treatment for mild to meddle stage of acne vulgaris.

Skin Pigmentation

1. Vitiligo

Nigella sativa oil as shown before is very effective treatment for different kinds of diseases such as vitiligo, which is a hypopigmentation disorder causing considerable psychological morbidity in a large proportion of its sufferers. Some studies have focused on this point.

THERAPEUTIC POTENTIAL OF NUTRACEUTICALS IN HUMAN HEALTH:

1. Nutraceuticals in Cardiovascular Diseases (CVD)

Heart disorders, such as hypertension (high blood pressure), coronary heart disease (heart attack), and various forms of cerebrovascular disease (stroke), are all associated with cardiovascular diseases.

Overconsumption of calorie-dense, nutrient-deficient, deeply processed, and easily absorbable meals can result in systemic inflammation, decreased insulin sensitivity, including several metabolic abnormalities, including obesity, hypertension, dyslipidemia, and glucose intolerance. Polyphenols present in grape and grape derivatives, cocoa, and tea have been studied for their potential to reduce cardiovascular disease. By altering cellular metabolism, vitamin D, coenzyme Q10, folic acid, omega-3 fatty acids, and polyphenols help to prevent artery disease. Flavonoids found in onion, grape, apples, and cherries inhibit the Angiotensin Converting Enzyme (ACE), lowering blood pressure and reducing the risk of coronary artery disease and myocardial infarction. Flavonoids prevent platelet stickiness and accumulation (by opposing the "suicide" enzyme cyclooxygenase that breaks down prostaglandins), and they also keep the vascular system and support small capillaries that carry oxygen and necessary nutrients to the entire cell.[6]

2. Nutraceuticals in cancer

Cancer is defined as abnormal cell division in any part of the body, and malignant cells can influence our normal cells. Cancer is caused by a combination of complicated elements that develop in a stepwise manner, eventually leading to the uncontrolled spread and proliferation of malignant cells throughout the body, a process known as metastasis. It is one of the most important global health firms, with continuing increases in revenue and morality. Oxidative stress and redox waving, in addition to environmental variables, are important in the origin and spread of cancer. Cancer cells' receptivity to therapeutic interventions is also harmed by reactive oxygens. Chronic inflammation is linked to a higher risk of cancer. Chronic inflammation has also been linked to immunological supp

level, free radicals and aldehydes produced by chronic inflammation can promote gene alterations and posttranslational modifications of cancerrelated proteins. Natural products or antioxidants (e.g., microbial and plant secondary metabolites) are employed as adjuvants to chemotherapy medications to increase their effectiveness, rather than other pharmaceutical drugs. Ginger, garlic, flaxseed, cabbage, soybeans, fenugreek, green tea, and umbellifers vegetables are examples of foods and herbs with high anticancer activity. Nutraceuticals, especially phytochemicals, play a role in cancer recovery. To date, all widely used cancer medications have come from naturally sources. Cancer patients should eat foods that have a low carbohydrate content and a moderate amount of protein,

LITERATURE OF REVIEW:

1 The term nutraceutical was coined from nutrition and pharmaceutical in 1989 by Stephen Defelice, founder and chairman of foundation for innovation in medicine, an American organization which encourages medical health.

2 In recent years, functional foods have gained attention for their potential health benefits beyond basic nutrition, serving as rich sources of proteins, carbohydrates, vitamins, and dietary fiber. Enriched with bioactive compounds such as polyphenols, tannins, flavonoids, and alkaloids, these foods have shown promise in inhibiting cell signaling pathways related to proliferation, communication, and apoptosis. Shilpa P. Chaudhari*, Priyatama V. Powar and Mahesh N. Pratapwar

3 Nutraceuticals have received considerable interest because of their presumed safety. The Present article focuses on the need for consuming appropriate diets, health issues surrounding failure to adhere to the known healthy eating models, development of new nutraceuticals/functional foods/food supplements with novel health benefits, elucidation mechanisms of action of these produ Aastha Visen, ... Pradeep K.S. Visen,

4 Functional Foods and Nutraceuticals in Metabolic and Non-Communicable Diseases, 2022 Zeisel [92] defined a nutraceutical as “a diet supplement that delivers a concentrated form of a biologically active component of food in a nonfood matrix in order to enhance heal

AIM: - NUTRACEUTICAL IMPACT ON HEALTH CARE OBJECTIVES: -

Anti-inflammatory: Nigella sativa can help with inflammation in the body, which can be a response to injury or infection. It can also help with conditions like allergic rhinitis, sinusitis, eczema, and osteoarthritis.

Antimicrobial: Nigella sativa has a broad antimicrobial spectrum that can help against bacteria, viruses, parasites, and fungi.

Antiviral: Nigella sativa can help improve immunity by increasing T helper cells, suppressor T cells, and natural killer cell activity.

Antioxidant: Nigella sativa can increase the action of antioxidant enzymes.
Immunomodulatory: Nigella sativa can help modulate the immune system.
Relaxant: Nigella sativa can relax the smooth muscle in the trache

Need for Work

1.Rise in Chronic Diseases:
Increasing global prevalence of lifestyle-related diseases (e.g., diabetes.,hypertension, obesity) demands preventive health strategies. Nutraceuticals may help reduce the incidence or severity of such conditions.

2.Shift Toward Preventive Healthcare: Modern healthcare emphasizes prevention rather than only treatment. Nutraceuticals support this model by promoting wellness and reducing disease risk.

3.Limitations of Pharmaceuticals: Long-term use of synthetic drugs often leads to side effects and high costs.Nutraceuticals may serve as safer, more natural alternatives or adjuncts.

4.Public Demand for Natural Remedies: Consumers are increasingly seeking natural, food-based solutions for health.Studying nutraceuticals helps validate or correct public perceptions.

5.Economic Burden on Healthcare Systems: Nutraceuticals have the potential to lower healthcare costs by reducing hospitalizations and medication use. Understanding their true impact can inform policy and investment decisions.

6.Lack of Clinical Evidence: Despite widespread use, many nutraceuticals lack sufficient scientific validation. Research is needed to assess efficacy, safety, and long-term health effects.

7.Regulatory Gaps and Safety Concerns: Many countries have weak or unclear regulations for nutraceuticals. Studying their impact can support development of stronger regulatory frameworks.

8. Potential for Personalized Nutrition: Advances in nutrigenomics open doors for tailored nutraceutical use based on individual genetic profiles.Research is essential to realize this potential safely and effectively.

9. Need for Integration into Mainstream Healthcare: Proper evaluation can help determine how nutraceuticals can be integrated into clinical guidelines and therapeutic protocols.

10. Contribution to Global Health Goals: Promoting scientifically proven nutraceuticals supports WHO goals related to nutrition, non-communicable diseases, and health equity.

PLANT PROFILE
Scientific Name: Nigella Sativa Linn
Family: Ranunculaceae
Genus: Nigella
Species: Sativa
Common Name: Black Seed, Kalonji

ivated

BOTANICAL DESCRIPTION
1. Stem: Erect, branched, 30-60 cm tall, pubescent
2. Leaves: Alternate, simple, lanceolate, 2-4 cm long, grayish-green
3. Flowers: Solitary, axillary, 5-10 mm diameter, blue or white
4. Sepals: 5, petal-like
5. Petals: 5, minute
6. Stamens: Numerous
7. Fruit: Capsule, 1-2 cm long, 5-10 mm wide, containing numerous seeds
8. Seeds: Black, shining, 3-5 mm long, triangular

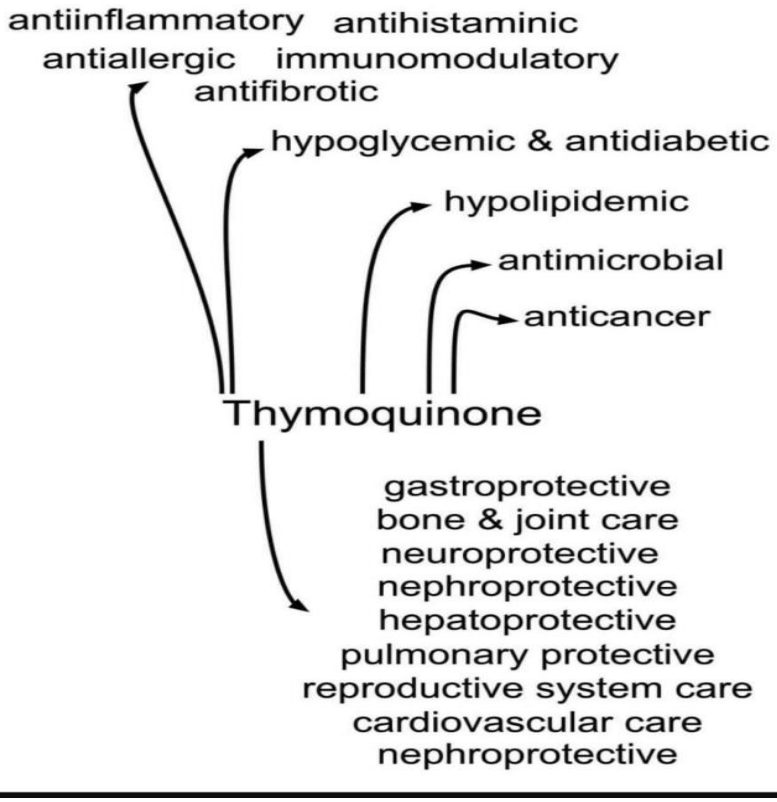
Morphological Characteristics
1. Root: Taproot with secondary roots
2. Seedling: Hypocotyl 1-2 cm long
3. Inflorescence: Solitary flowers or corymbose
4. Flower Color: Blue, white, or pale yellow

Pharmacological Actions
1. Anti-inflammatory: Inhibits COX-2, reduces prostaglandins and leukotrienes.
2. Antimicrobial: Effective against bacteria, viruses, fungi, and parasites.
3. Antioxidant: Scavenges free radicals, enhances antioxidant enzymes.
4. Immunomodulatory: Modulates immune response, enhances cytokine production.
5. Anti-cancer: Induces apoptosis, inhibits cell proliferation and metastasis.
6. Cardiovascular: Hypolipidemic, antihypertensive, anti-atherogenic.
7. Neuroprotective: Anxiolytic, antidepressant, neuroregenerative.
8. Hepatoprotective: Protects liver against toxicity.
9. Nephroprotective: Protects kidneys against damage.

ACTIVE COPONENT
1 thymoquinone; primary bioactive compound
2 Nigellone: Alkaloid with antioxidant and anti-inflammatory properties.

3 α-Hederin: Saponin with anti-inflammatory and antimicrobial properties
4 β-Sitosterol: Phytoster

antioxidant properties.
5 Flavonoids: Quercetin, kaempferol, and isorhamnetin.



MATERIAL AND METHOD:

1. Nigella sativa seeds: Fresh or dried seeds are used for extraction, oil production, or whole seed consumption.
2. Solvents: Ethanol, methanol, hexane, or water are used for extraction.
3. Carrier oils: Coconut, olive, or jojoba oil are used for diluting essential oils.
4. Equipment: Grinder, extractor, distillation apparatus, and glassware

1. Extraction methods:
   - Solvent extraction (Soxhlet, maceration)
   - Cold pressing
   - Supercritical fluid extraction (CO2)
   - Ultrasonic-assisted extraction

PROCEDURE

Collect the fresh and dried seed of nigella sativa
For extraction oil production or whole seed consumption
Add the solvent in extracted oil of black cumin
Use solvent are ethanol,methanol,hexane or water are used for extraction
Add carrier oil,coconut,olive are used for diluting
Extraction occure in Soxhlet apparatus

TRADITIONAL METHOD

1. Seed selection: Choose high-quality Nigella sativa seeds.
2. Cleaning: Clean the seeds to remove impurities.
3. Drying: Dry the seeds to reduce moisture content.
4. Grinding: Grind the seeds into a fine powder.
5. Oil extraction: Use a mechanical press or solvent extraction (e.g., hexane) to extract the oil.
6. Filteration: Filter the oil through a cheesecloth or filter paper.
7. Storage: Store the oil in dark glass bottles.

PLAN OF WORK:

collection of material clean and dry the seed of nigella sativa dry in sunlight 2 days after drying reduce the size of material extraction occur in Soxhlet apparatus time require for extraction 2days 24 hour
evaluation study of extracted data

CONCLUSION:

Nigella sativa's antioxidant and anti-inflammatory properties make it a valuable nutraceutical ingredient. Further research should explore optimal dosages, bioavailability, and synergistic effects with another compound. Nutraceuticals have a long history of usage in the treatment of disease, and these substances will continue to be used in modern and future medicine. To guarantee the products' safety, improved quality, purity, efficiency, impacts on promoting health and healing diseases, as well as a clearer understanding of the numerous processes used in item development, further study is still required. Extreme care must be taken when taking supplements. Therefore, there is a need for basic research and discussion on the advantages, recommended daily intake, and potential negative consequences of supplement use. After that, we might substitute "nutraceutical day may keep the doctor away" for the proverb "an apple a day keeps the doctor away." "In the future, nutraceuticals will be marketed to support good health. Public health authorities today view nutraceuticals as beneficial functional foods for preserving health and battling nutritionally induced acute and chronic disorders, as well as for enhancing quality of life.

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