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## Review Article

# Review Article on Multinutrient Herbal Tablet

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### ABSTRACT

Herbal multinutrient tablets are emerging as a natural and effective alternative to synthetic nutritional supplements, combining the therapeutic benefits of medicinal plants with essential nutrients required for maintaining optimal health. These formulations typically incorporate a blend of herbal extracts rich in vitamins, minerals, antioxidants, and bioactive compounds that support overall well-being, boost immunity, and help prevent nutritional deficiencies. The present study focuses on the formulation and evaluation of a herbal multinutrient tablet using selected plant-based ingredients known for their high nutritional and medicinal value. The preparation process involves drying, pulverizing, and blending the herbal components, followed by tablet compression using suitable excipients. The formulated tablets are evaluated for physicochemical parameters such as hardness, friability, disintegration time, weight variation, and stability. The use of herbal ingredients offers advantages such as reduced side effects, improved bioavailability, and synergistic health benefits compared to conventional supplements. These tablets can serve as a convenient and cost-effective means of delivering essential nutrients, particularly in populations with limited access to balanced diets. The study highlights the potential of herbal multinutrient tablets as a safe, sustainable, and holistic approach to nutritional supplementation.

## INTRODUCTION

Proper nutrition is essential for maintaining health, growth, and overall well-being. In modern society, dietary patterns have significantly changed due to urbanization, lifestyle shifts, and increased consumption of processed foods. As a result, many individuals fail to meet their daily nutritional

requirements, leading to deficiencies in essential vitamins and minerals.

Malnutrition is not limited to undernutrition but also includes micronutrient deficiencies, often referred to as “hidden hunger.” Deficiencies in nutrients such as iron, calcium, vitamin A, vitamin D, and B-complex vitamins can lead to various health complications including anemia, weakened

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immunity, fatigue, and impaired cognitive function.

To address nutritional gaps, dietary supplements have become increasingly popular. Conventional supplements are typically synthetic and provide isolated nutrients. While they are effective in treating deficiencies, long-term use may sometimes lead to side effects, reduced absorption efficiency, or nutrient imbalance.

Moreover, synthetic supplements often lack additional bioactive compounds that enhance nutrient absorption and provide holistic health benefits. This has created a growing demand for natural and plant-based alternatives.

Herbal multinutrient tablets are formulations that combine various medicinal plants known for their nutritional and therapeutic properties. These tablets provide a wide range of nutrients such as vitamins, minerals, antioxidants, and phytochemicals in a single dosage form.

Unlike synthetic supplements, herbal formulations offer synergistic effects, where different plant components work together to enhance overall efficacy. These tablets are designed to support immunity, improve digestion, boost energy levels, and maintain general health.

Herbal medicine has been used for centuries in traditional systems such as Ayurveda, Traditional Chinese Medicine, and other indigenous practices. These systems emphasize the use of natural plant-based remedies to restore balance in the body.

Herbal ingredients are generally considered safe, cost-effective, and easily available. They contain natural bioactive compounds such as flavonoids, alkaloids, tannins, and glycosides that contribute to their therapeutic effects.

Phytochemicals are naturally occurring compounds found in plants that provide health benefits beyond basic nutrition. These include antioxidants, anti-inflammatory agents, and immune-boosting substances.

Key phytochemicals include:

- Flavonoids – act as antioxidants
- Alkaloids – possess medicinal properties
- Saponins – help in cholesterol regulation
- Tannins – exhibit antimicrobial activity

These compounds help in preventing chronic diseases such as cardiovascular disorders, diabetes, and cancer.

Herbal multinutrient tablets may include a combination of nutrient-rich plants such as:

- *Moringa oleifera* – rich in vitamins, calcium, and iron
- *Emblica officinalis* – high in vitamin C and antioxidants
- *Ocimum sanctum* – boosts immunity and respiratory health
- *Withania somnifera* – improves energy and reduces stress
- *Azadirachta indica* – antimicrobial and detoxifying properties

These herbs contribute both nutritional and therapeutic benefits.

Herbal tablets offer several advantages over conventional supplements:

- Natural and safe with minimal side effects
- Provide multiple nutrients in a single formulation
- Better absorption due to natural matrices
- Possess additional therapeutic properties
- Environmentally sustainable and cost-effective

They are especially beneficial for individuals seeking holistic health solutions.

Tablets are one of the most preferred dosage forms due to their convenience, stability, and ease of administration. They allow accurate dosing, longer shelf life, and ease of transportation.

In herbal formulations, tablets ensure:

- Uniform distribution of active ingredients
- Controlled release of nutrients
- Improved patient compliance

## SCOPE & BOUNDARIES

The scope of the present study on herbal multinutrient tablets focuses on the formulation and evaluation of a natural, plant-based nutritional supplement designed to provide essential vitamins, minerals, and antioxidants for overall health improvement. The study emphasizes the use of nutrient-rich medicinal plants such as *Moringa oleifera*, *Embllica officinalis*, and *Withania somnifera*, which are known for their high nutritional and therapeutic value. It includes the preparation of tablets using standard pharmaceutical techniques like drying, powdering, blending, and compression, along with evaluation based on parameters such as hardness, friability,

disintegration time, weight variation, and stability. The formulation is intended to support general health, boost immunity, and help prevent micronutrient deficiencies, particularly among individuals with inadequate dietary intake or increased nutritional needs.

However, the study is limited by certain boundaries. It does not involve extensive clinical trials to establish therapeutic efficacy in humans, and the variability in herbal raw materials due to environmental and cultivation factors may affect consistency. Standardization of active constituents remains a challenge, and the bioavailability of nutrients from herbal sources may vary among individuals. Additionally, the study may include only short-term stability analysis, and the formulation is intended solely as a dietary supplement, not as a substitute for a balanced diet or a treatment for serious diseases. Regulatory guidelines set by authorities such as the Food Safety and Standards Authority of India also impose certain restrictions on claims and usage. Overall, while the study provides a useful basis for herbal supplementation, further research and clinical validation are required to establish its full effectiveness.

## METHODS

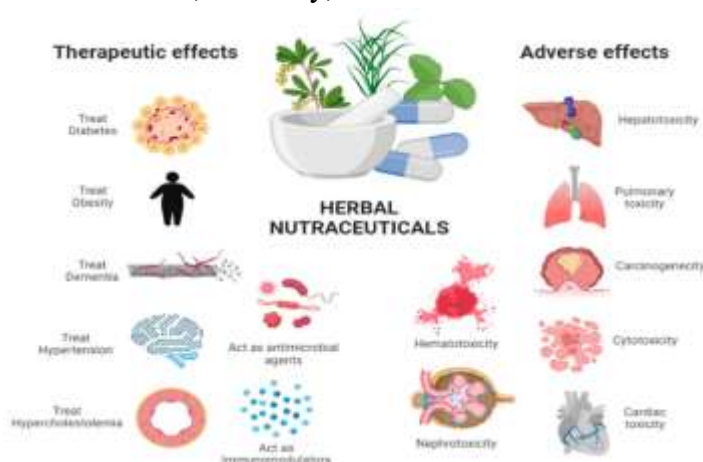


FIG :- HERBAL NUTRACEUTICALS

The present study was carried out to formulate and evaluate herbal multinutrient tablets using selected plant-based ingredients known for their nutritional and therapeutic properties. The entire methodology was systematically divided into stages including selection and authentication of raw materials, preparation of herbal powders, formulation of tablets, and evaluation of the final product.

The first step involved the careful selection of herbal ingredients based on their nutritional value, availability, and traditional usage in health promotion systems such as Ayurveda. Commonly selected herbs included *Moringa oleifera* for its rich vitamin and mineral profile, *Embllica officinalis* for its high vitamin C content and antioxidant properties, and *Withania somnifera* for its adaptogenic and energy-enhancing effects. The raw plant materials were procured from reliable local suppliers and subjected to authentication by a qualified botanist to ensure their identity and purity. Foreign matter, adulterants, and damaged plant parts were removed manually.

Following procurement, the raw materials were cleaned thoroughly using distilled water to eliminate dust, soil, and microbial contaminants. The cleaned plant materials were then dried under shade at room temperature to preserve heat-sensitive phytoconstituents. Shade drying was preferred over sun drying to prevent degradation of active compounds such as vitamins and flavonoids. The drying process was continued until a constant weight was achieved, indicating complete removal of moisture.

Once dried, the plant materials were pulverized separately using a mechanical grinder to obtain fine powders. The powders were then passed through a standard sieve (such as sieve number 60 or 80) to ensure uniform particle size, which is essential for proper mixing and tablet formation.

The powdered materials were stored in airtight containers to prevent moisture absorption and contamination.

In the next stage, the formulation of herbal multinutrient tablets was carried out. A specific ratio of each herbal powder was weighed accurately using an analytical balance. The powders were then blended thoroughly using a suitable mixing technique such as geometric dilution to ensure uniform distribution of all components. Along with the herbal powders, suitable pharmaceutical excipients were added to facilitate tablet formation. These included binders (such as starch or gum acacia) to provide cohesion, diluents (such as lactose or microcrystalline cellulose) to increase bulk, lubricants (such as magnesium stearate) to reduce friction during compression, and disintegrants (such as sodium starch glycolate) to promote tablet breakup after ingestion.

The granulation process was then carried out to improve the flow properties and compressibility of the powder blend. Wet granulation was commonly employed, in which a binder solution was prepared and added gradually to the powder mixture to form a damp mass. The mass was then passed through a sieve to form granules, which were subsequently dried in a hot air oven at controlled temperature. The dried granules were again passed through a sieve to break lumps and obtain uniform granule size.

After granulation, the granules were lubricated by mixing with a small quantity of lubricant to prevent sticking during compression. The final blend was then compressed into tablets using a tablet compression machine. The compression force was adjusted to obtain tablets with adequate hardness and mechanical strength while ensuring proper disintegration.



The prepared tablets were then subjected to various evaluation tests to assess their quality and performance. The physical appearance of the tablets, including color, shape, and surface texture, was visually examined.

Weight variation test was performed by weighing individual tablets and calculating the average weight to ensure uniformity. Hardness of the tablets was measured using a hardness tester to determine their mechanical strength. Friability test was conducted using a friabilator to evaluate the resistance of tablets to abrasion during handling and transportation.

Disintegration test was carried out using a disintegration apparatus to determine the time required for tablets to break down into smaller particles in a specified medium, usually simulated gastric fluid. This test is crucial to ensure that the active ingredients are released for absorption. In addition, dissolution studies may be performed to evaluate the rate and extent of nutrient release from the tablets.

Stability studies were also conducted to assess the shelf-life and storage conditions of the formulated tablets. The tablets were stored under different environmental conditions such as room temperature and accelerated conditions, and were periodically evaluated for changes in physical appearance, hardness, and disintegration time. These studies help in determining the stability and quality of the product over time.

Microbial analysis was performed to ensure that the tablets were free from harmful microorganisms and safe for consumption. Standard microbiological tests were conducted to check for bacterial and fungal contamination within acceptable limits.

All experimental data obtained from evaluation tests were recorded and analyzed systematically. The results were compared with standard specifications to determine the quality and acceptability of the formulated tablets. Any deviations were noted and necessary adjustments in formulation or processing were made to optimize the final product.

Thus, the methodology adopted in this study ensured a systematic approach to the development of herbal multinutrient tablets, combining traditional knowledge with modern pharmaceutical techniques to produce a safe, effective, and stable nutritional supplement.

## **PREFORMULATION STUDIES**

Preformulation studies of herbal multinutrition tablets involve the systematic investigation of the physical, chemical, biological, and mechanical properties of multiple herbal ingredients used to develop a stable, effective, and acceptable dosage form. Unlike single-drug formulations, herbal multinutrition tablets contain a combination of plant-based ingredients such as vitamins, minerals, and bioactive phytoconstituents derived from herbs like amla, moringa, ashwagandha, spirulina, and others. These complex mixtures require extensive preformulation evaluation to ensure compatibility, stability, uniformity, and therapeutic effectiveness.

The main objective of preformulation studies in herbal multinutrition tablets is to understand the nature of each ingredient and their interactions in a multi-component system. Since herbal products contain numerous active compounds, variability in composition, and sensitivity to environmental conditions, preformulation becomes even more critical compared to synthetic drugs. These studies help in selecting suitable excipients, optimizing

the formulation process, and ensuring consistent product quality.

One of the primary aspects of preformulation is the evaluation of organoleptic properties of herbal ingredients. These include color, odor, taste, and texture. Herbal materials often have strong and sometimes unpleasant tastes or odors, which can affect patient compliance. Therefore, understanding these properties helps in deciding the need for taste masking, flavoring agents, or coating of tablets.

The study of physical properties such as particle size, shape, and surface area is crucial in herbal multinutrition formulations. Herbal powders may have irregular texture and poor flow characteristics, which can affect uniform mixing and tablet compression. Particle size reduction through milling improves uniformity and dissolution, but excessive grinding may lead to degradation of heat-sensitive nutrients. Hence, optimization is necessary.

Solubility studies play a significant role in understanding the bioavailability of herbal nutrients. Many phytoconstituents have poor water solubility, which can limit their absorption in the body. Solubility is studied in different solvents and pH conditions to determine the best method for enhancing dissolution. Techniques such as use of co-solvents, surfactants, or solid dispersions may be considered based on preformulation data.

Another critical parameter is pH and stability profile. Herbal extracts may be sensitive to changes in pH, leading to degradation of active components such as vitamins or antioxidants. Stability studies are conducted under different conditions of temperature, humidity, and light to determine the shelf life and storage requirements. Common degradation pathways include oxidation

and hydrolysis, especially in vitamin-rich herbal formulations.

Drug-excipient compatibility studies are essential in herbal multinutrition tablets because of the presence of multiple active ingredients. Interactions between herbs and excipients can affect the stability and efficacy of the product. Analytical techniques such as FTIR (Fourier Transform Infrared Spectroscopy), DSC (Differential Scanning Calorimetry), and chromatography are used to detect incompatibilities and chemical interactions.

The evaluation of flow properties is particularly important in herbal formulations, as herbal powders often exhibit poor flowability due to their fibrous nature. Parameters such as angle of repose, bulk density, tapped density, Carr's index, and Hausner ratio are measured. Poor flow can lead to problems like weight variation and content non-uniformity in tablets, so flow enhancers or granulation techniques may be required.

Compressibility and compactibility studies determine the ability of herbal powder blends to form tablets under pressure. Many herbal powders lack good binding properties, making direct compression difficult. Preformulation studies help in deciding whether to use wet granulation, dry granulation, or direct compression methods, and in selecting appropriate binders.

Moisture content and hygroscopicity are critical factors in herbal multinutrition tablets. Herbal materials often absorb moisture from the environment, which can lead to microbial growth, degradation of nutrients, and changes in tablet hardness. Loss on drying (LOD) and moisture sorption studies are conducted to determine suitable storage conditions and packaging materials.



Another important aspect is microbial load analysis. Since herbal ingredients are natural products, they are more prone to microbial contamination. Preformulation studies include testing for total microbial count, yeast and mold count, and the presence of pathogens. Proper drying, processing, and use of preservatives are considered based on these results.

Standardization of herbal extracts is a key step in preformulation. Unlike synthetic drugs, herbal ingredients may vary in composition due to differences in plant source, harvesting conditions, and processing methods. Standardization ensures that each batch contains a consistent amount of active constituents, which is essential for therapeutic effectiveness.

Nutrient interaction studies are unique to multinutrition formulations. Vitamins and minerals may interact with each other or with herbal constituents, leading to reduced stability or bioavailability. For example, certain minerals may catalyze oxidation of vitamins. Preformulation studies help identify such interactions and guide the formulation strategy.

The evaluation of dissolution characteristics is also important. It determines how quickly and efficiently the nutrients are released from the tablet in the body. Dissolution studies help in optimizing formulation parameters to ensure maximum bioavailability.

In addition, packaging compatibility studies are conducted to ensure that the selected packaging material does not interact with the formulation. Herbal multinutrition tablets are often sensitive to light, moisture, and oxygen, so appropriate packaging such as blister packs or airtight containers is chosen.

Overall, preformulation studies of herbal multinutrition tablets are complex and multifaceted due to the presence of multiple natural ingredients. These studies provide essential data for the development of a stable, effective, and high-quality product. They help in overcoming challenges related to variability, stability, and compatibility, ensuring that the final formulation delivers the intended nutritional and therapeutic benefits.

In conclusion, preformulation studies play a vital role in the successful development of herbal multinutrition tablets. By thoroughly understanding the properties of each component and their interactions, formulation scientists can design tablets that are not only effective but also safe, stable, and acceptable to patients. These studies form the backbone of herbal pharmaceutical development and are indispensable for achieving consistent product quality.

## **FUTURE ASPECTS**

The future of herbal multinutrient tablets holds significant promise in the field of healthcare and nutrition, particularly as the global population increasingly shifts toward natural, plant-based, and preventive approaches to health management. With rising awareness about the limitations and side effects of synthetic supplements, there is a growing demand for safer and more holistic alternatives derived from traditional medicinal systems such as Ayurveda. This shift is expected to drive extensive research and innovation in the formulation, standardization, and large-scale production of herbal multinutrient tablets, making them an integral part of modern healthcare systems.

One of the major future directions lies in the advanced standardization of herbal formulations.



Currently, variability in the composition of plant materials due to environmental conditions, geographical location, and harvesting techniques poses a challenge in ensuring consistent quality. Future research is likely to focus on developing sophisticated analytical techniques such as chromatographic and spectroscopic methods to identify and quantify active constituents in herbs like *Moringa oleifera*, *Emblca officinalis*, and *Withania somnifera*. These advancements will help in achieving batch-to-batch consistency and improving the reliability of herbal products.

Another important aspect is the enhancement of bioavailability and efficacy. Although herbal formulations are naturally rich in nutrients and phytochemicals, their absorption in the human body can vary. Future developments may include the use of novel drug delivery systems such as nanoparticles, liposomes, and phytosomes to improve the bioavailability of herbal constituents. These technologies can enhance the stability, absorption, and targeted delivery of nutrients, thereby increasing the therapeutic effectiveness of herbal multinutrient tablets.

The integration of modern pharmaceutical technologies with traditional knowledge will also play a crucial role in the future. Techniques such as controlled-release and sustained-release formulations can be incorporated into herbal tablets to ensure a steady release of nutrients over time. This would improve patient compliance and provide prolonged therapeutic effects. Additionally, the use of advanced excipients and coating technologies can enhance the stability, taste, and appearance of tablets, making them more acceptable to consumers.

The future also holds potential for personalized nutrition, where herbal multinutrient tablets can be tailored according to individual needs based on factors such as age, gender, lifestyle, and genetic

profile. With the advancement of fields like nutrigenomics, it may become possible to design customized herbal supplements that address specific nutritional deficiencies and health conditions. This personalized approach can significantly improve the effectiveness of supplementation and promote optimal health outcomes.

Another promising area is the expansion of clinical research and scientific validation. While traditional knowledge provides a strong foundation, there is a growing need for evidence-based studies to establish the safety and efficacy of herbal formulations. Future research is expected to include well-designed clinical trials, toxicity studies, and pharmacokinetic evaluations to provide scientific validation for the use of herbal multinutrient tablets. This will increase their acceptance among healthcare professionals and regulatory authorities.

The global market potential for herbal supplements is also expected to grow rapidly. Increasing consumer awareness, rising healthcare costs, and a preference for natural products are driving the demand for herbal formulations worldwide. Countries like India, with a rich heritage of medicinal plants and traditional knowledge, have a unique opportunity to become global leaders in the production and export of herbal multinutrient tablets. Government initiatives and support from organizations such as the Food Safety and Standards Authority of India are likely to play a significant role in promoting quality standards and ensuring the safety of these products.

Sustainability and environmental considerations will also shape the future of herbal multinutrient tablets. The increasing demand for medicinal plants may lead to overexploitation of natural resources. Therefore, future efforts will focus on



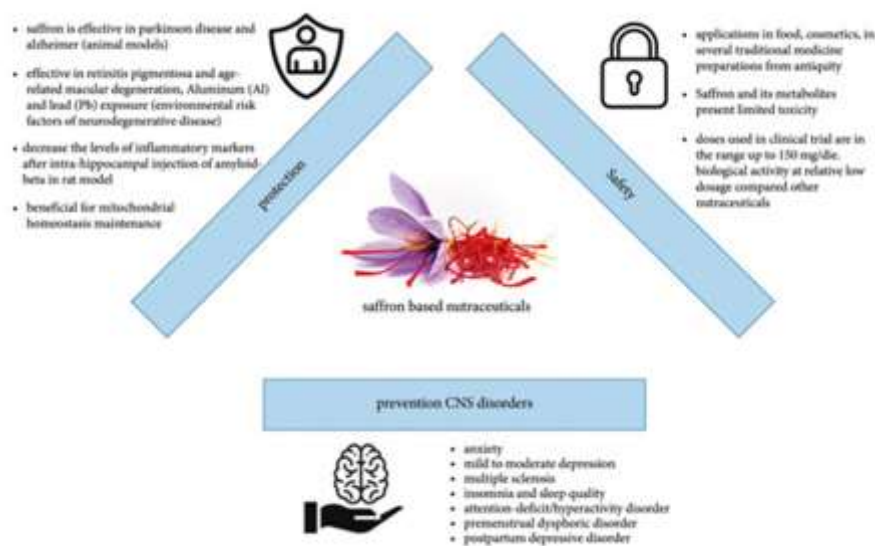
sustainable cultivation practices, conservation of medicinal plants, and the use of eco-friendly manufacturing processes. Cultivation of herbs under controlled conditions and the use of organic farming methods can help in maintaining the quality and availability of raw materials.

The application of digital technologies and artificial intelligence in herbal research is another emerging trend. AI-based tools can be used to analyze large datasets, predict interactions between herbal components, and optimize formulations. This can significantly accelerate the development process and improve the efficiency of research in this field.

In addition, there is potential for the development of multi-functional herbal formulations that not

only provide nutritional benefits but also address specific health conditions such as immunity enhancement, stress management, and metabolic disorders. Combining herbs with complementary actions can result in formulations that offer both preventive and therapeutic benefits, making them more valuable in modern healthcare.

The future may also witness increased integration of herbal supplements into mainstream healthcare systems. With proper standardization, quality control, and clinical validation, herbal multinutrient tablets can be recommended by healthcare professionals as part of routine health management. This integration can help bridge the gap between traditional and modern medicine.



## APPLICATION

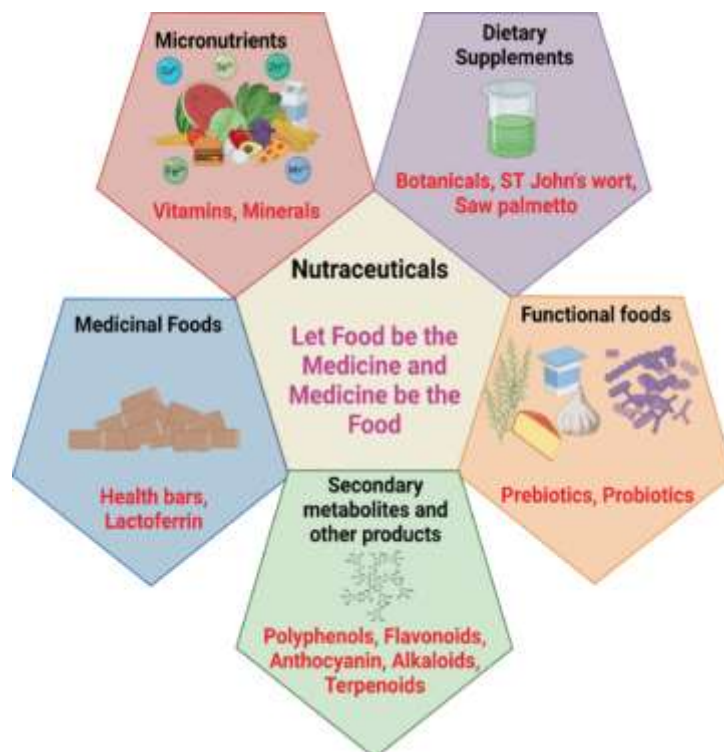
Herbal multinutrient tablets have a wide range of applications in the field of health and wellness due to their natural composition, nutritional richness, and therapeutic potential. In recent years, there has been a significant shift toward plant-based supplements as people become more aware of the importance of preventive healthcare and the limitations of synthetic products. These tablets

combine essential nutrients with bioactive phytochemicals, making them highly beneficial for maintaining overall health and preventing various diseases.

One of the primary applications of herbal multinutrient tablets is in the prevention and management of nutritional deficiencies. Many individuals, especially in developing regions, suffer from deficiencies of essential vitamins and

minerals due to poor dietary habits, economic constraints, or lack of awareness. Herbal ingredients such as *Moringa oleifera* and *Embolica officinalis* are rich in nutrients like iron, calcium, and vitamin C, which help in addressing

deficiencies such as anemia, weakened immunity, and poor bone health. Regular consumption of herbal multinutrient tablets can therefore play a crucial role in improving nutritional status and overall well-being.



Another important application is in boosting the immune system. Herbal components contain natural antioxidants and immunomodulatory compounds that help the body fight infections and diseases. For example, *Ocimum sanctum* is known for its immune-enhancing properties, while *Withania somnifera* helps reduce stress and improve resistance to illness. These tablets are particularly useful during seasonal changes, pandemics, or conditions where immunity is compromised.

Herbal multinutrient tablets are also widely used in general health maintenance and wellness promotion. They help in improving energy levels, enhancing metabolism, and supporting the proper functioning of various body systems. Individuals with busy lifestyles, irregular eating habits, or high

levels of physical and mental stress can benefit from these supplements as they provide a convenient way to meet daily nutritional requirements.

In addition, these tablets have applications in supporting mental health and reducing stress. Certain herbs possess adaptogenic properties that help the body cope with stress and anxiety. For instance, *Withania somnifera* is widely used for its calming effects and ability to improve cognitive function. Regular intake of such herbal supplements may help in reducing fatigue, improving concentration, and enhancing overall mental well-being.

Another significant application is in supporting digestive health. Many herbal ingredients aid in

digestion by stimulating digestive enzymes and improving gut health. These tablets can help in reducing common digestive issues such as indigestion, bloating, and constipation, thereby promoting better nutrient absorption and overall health.

Herbal multinutrient tablets also play a role in chronic disease prevention. The presence of antioxidants helps in neutralizing free radicals, which are responsible for cellular damage and aging. This reduces the risk of chronic conditions such as cardiovascular diseases, diabetes, and certain types of cancer. Regular consumption of antioxidant-rich herbal supplements can therefore contribute to long-term health and longevity.

In the field of women's health, these tablets have specific applications such as managing nutritional needs during pregnancy, lactation, and menstruation. They can help in preventing iron deficiency anemia, improving calcium levels, and supporting hormonal balance. Similarly, they are beneficial for elderly individuals who require additional nutrients to maintain bone density and overall health.

Another important application is in sports and fitness nutrition. Athletes and physically active individuals require higher levels of nutrients to support energy production, muscle recovery, and endurance. Herbal multinutrient tablets provide a natural alternative to synthetic supplements, helping in improving stamina and reducing fatigue without harmful side effects.

These tablets are also useful in public health programs and community nutrition initiatives. Governments and health organizations can use them as cost-effective supplements to combat malnutrition in vulnerable populations such as children, pregnant women, and the elderly. Their

natural origin and ease of administration make them suitable for large-scale distribution.

In the pharmaceutical and nutraceutical industries, herbal multinutrient tablets have applications in the development of value-added health products. With increasing consumer demand for natural and organic products, companies are investing in research and development to create innovative formulations that combine multiple health benefits in a single dosage form.

Furthermore, these tablets are used in preventive healthcare systems such as Ayurveda, where the focus is on maintaining balance in the body and preventing disease. They align well with the principles of holistic health and are often recommended as daily supplements for maintaining vitality and longevity.

Another emerging application is in personalized nutrition, where formulations can be customized based on individual health needs, lifestyle, and genetic factors. This approach is expected to become more prominent in the future with advancements in nutritional science and technology.

In addition, herbal multinutrient tablets are being explored for their role in skin and hair health. Nutrients such as vitamins, minerals, and antioxidants help in improving skin texture, reducing signs of aging, and promoting healthy hair growth. This has increased their popularity in the cosmetic and wellness industries.

Finally, these tablets have applications in rehabilitation and recovery. Individuals recovering from illness, surgery, or chronic conditions often require additional nutritional support to regain strength and vitality. Herbal multinutrient tablets provide a balanced combination of nutrients that



aid in faster recovery and improved health outcomes.

In conclusion, the applications of herbal multinutrient tablets are extensive and diverse, ranging from basic nutritional supplementation to advanced therapeutic and preventive healthcare uses. Their natural composition, safety, and holistic benefits make them a valuable addition to modern health practices. With continued research and innovation, their applications are expected to expand further, contributing significantly to global health and wellness.

## **BENEFITS**

Herbal multinutrient tablets offer a wide range of health benefits due to their unique combination of natural vitamins, minerals, and bioactive phytochemicals derived from medicinal plants. Unlike synthetic supplements that provide isolated nutrients, herbal formulations deliver a balanced spectrum of nutrients along with additional therapeutic compounds that support overall health and well-being. These tablets are increasingly being recognized as an effective and safer alternative for nutritional supplementation, especially in the context of modern lifestyle-related deficiencies and chronic health conditions.

One of the most significant benefits of herbal multinutrient tablets is their ability to provide essential nutrients naturally. Plants such as *Moringa oleifera* are known to contain high levels of vitamins A, C, calcium, potassium, and iron, which are essential for maintaining proper body function. Similarly, *Emblica officinalis* is a rich source of vitamin C and antioxidants that help in strengthening the immune system and protecting cells from oxidative damage. The natural origin of these nutrients ensures better compatibility with the human body and reduces the risk of toxicity compared to synthetic alternatives.

Another important benefit is the boosting of immunity. Herbal ingredients contain antioxidants and immunomodulatory compounds that enhance the body's defense mechanisms. For example, *Ocimum sanctum* helps in fighting respiratory infections and improving immune response, while *Withania somnifera* supports stress reduction and improves resistance to disease. Regular intake of these tablets helps in reducing the frequency of infections and promotes faster recovery from illnesses.

Herbal multinutrient tablets also provide the benefit of improving energy levels and reducing fatigue. Nutrient deficiencies are often associated with tiredness, weakness, and low productivity. The presence of iron, B-complex vitamins, and adaptogenic herbs helps in enhancing oxygen transport, improving metabolism, and supporting energy production at the cellular level. This makes the tablets especially useful for individuals with busy lifestyles, students, and working professionals.

Another key advantage is their role in supporting mental health and reducing stress. Many herbal ingredients possess adaptogenic properties, which help the body cope with physical and psychological stress. *Withania somnifera* is widely known for its calming effect on the nervous system, improving concentration, and reducing anxiety. This contributes to better mental clarity, improved mood, and enhanced cognitive performance.

These tablets also provide significant benefits in maintaining digestive health. Herbal compounds stimulate digestive enzymes, improve gut microbiota balance, and enhance nutrient absorption. As a result, individuals experience reduced issues such as indigestion, bloating, constipation, and poor appetite. Improved



digestion further ensures that the body effectively utilizes the nutrients present in the supplement.

Another important benefit is antioxidant protection and anti-aging effects. Herbal multinutrient tablets contain phytochemicals such as flavonoids, tannins, and polyphenols that neutralize free radicals in the body. Free radicals are responsible for cellular damage, premature aging, and the development of chronic diseases. By reducing oxidative stress, these tablets help in slowing down the aging process and maintaining healthy skin, hair, and internal organs.

## **CURRENT CHALLENGES AND LIMITATIONS**

Multinutrient tablets, also known as multivitamin or multimineral supplements, are widely used to prevent nutritional deficiencies and support general health. However, despite their popularity, they face several important challenges and limitations. One of the major issues is that they are often promoted as a “complete health solution,” even though scientific evidence shows that they cannot replace a balanced diet. Many experts emphasize that real food provides a complex mix of nutrients and bioactive compounds that tablets cannot fully replicate.

A key limitation is poor absorption and bioavailability. Not all nutrients in multivitamin tablets are absorbed efficiently by the human body. Some vitamins and minerals require specific conditions or cofactors for proper absorption. For example, fat-soluble vitamins like A, D, E, and K need dietary fat for optimal absorption. Without proper conditions, a significant portion of the nutrients may pass through the body unused.

Another challenge is nutrient interaction within the tablet itself. When many vitamins and minerals are combined into a single pill, they can interfere with

each other’s absorption. For instance, calcium may reduce the absorption of iron and zinc when taken together. This internal competition reduces the overall effectiveness of multinutrient formulations.

A serious limitation is the risk of overconsumption and toxicity. While water-soluble vitamins like vitamin C are usually excreted, fat-soluble vitamins can accumulate in the body. Excess intake of vitamins A and D, for example, may lead to toxicity, causing liver damage, kidney problems, or other health complications. This risk increases when people take multiple supplements simultaneously.

Another important challenge is lack of standardization and regulation. In many countries, dietary supplements are not regulated as strictly as pharmaceutical drugs. This leads to variations in quality, purity, and actual nutrient content across brands. Some products may contain less or more than what is stated on the label, reducing reliability and safety.

## **CONCLUSION**

Overall, multinutrient tablets should be viewed as a supportive health aid rather than a primary source of nutrition. While they can help fill dietary gaps in certain situations, relying on them too much may lead to neglect of proper dietary habits. A balanced and varied diet remains essential for providing the body with nutrients in their most natural and effective forms.

In addition, the use of multinutrient supplements should always be based on individual needs and medical advice. Blind or unnecessary consumption may not provide any added benefit and can sometimes cause harm due to excess intake of certain vitamins and minerals. Personalized



nutrition guidance is therefore more effective than generalized supplementation.

Furthermore, improving public awareness about nutrition is crucial. Many people take multivitamins without understanding their actual limitations. Educating individuals about healthy food choices, nutrient-rich diets, and the proper role of supplements can reduce misuse and improve overall health outcomes.

To conclude, while multinutrient tablets have a place in modern healthcare, especially for people with deficiencies or special conditions, they cannot replace the value of natural foods. A balanced lifestyle, proper diet, and informed use of supplements together form the best approach to achieving good health.

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