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ENHANCING GUT HEALTH, ENERGY, AND MICRONUTRIENT STATUS IN YOUNG ADULTS: THE ROLE OF GOOD MONK NUTRITION PREMIX

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Abstract

Micronutrient deficiencies (MND) impact approximately 2 billion individuals globally, contributing to significant morbidity and mortality. The National Family Health Survey-5 reveals that 57% of Indian women aged 15-49 are anaemic, with anaemia affecting 59% of adolescent girls and 30% of adolescent boys. A 2021 meta-analysis of 270 studies found vitamin D deficiency to be the most prevalent in India, affecting 61% of the population, followed by deficiencies in iron (54%), vitamin B12 (53%), folic acid (37%), and iodine (17%). This study aimed to evaluate the efficacy and safety of a 4.6 g daily dose of the Good Monk Nutrition Premix in enhancing gut health, energy levels, immune function, and addressing micronutrient deficiencies in healthy individuals aged 13–35 years. The study was conducted as a single-arm, open-label clinical trial over 120 days, with participants receiving Good Monk as an adjuvant to their regular diet. Primary outcomes included gut health, energy, growth, immunity, and micronutrient levels (Vitamin B12, Vitamin D, Iron) biomarkers such as Immunoglobulin G (IgG), C-reactive protein (CRP). Results indicated significant improvements in gut health, with reductions in gastrointestinal symptoms, enhanced energy levels (24.4% improvement in the 30-Second Chair Stand Test), and increased micronutrient levels. Micronutrient analysis revealed notable improvement of 65.4%, 26% and 30.8% in vitamin B12, Vitamin D and iron levels from baseline to the final visit at 120 days. Additionally, significant improvements in immunity were observed. The Nutrition Premix was well-tolerated, with no significant adverse events. These findings suggest that Good Monk nutrition premix may be an effective, safe addition to dietary practices to improve gut health, energy, immunity, and address micronutrient deficiencies.

Keywords: Micronutrient Deficiency, Gut Health, Energy Enhancement, Immunity, Vitamin B12, Vitamin D, Iron, Micronutrient Premix

1. Introduction

Micronutrient deficiencies (MND) represent a widespread global health challenge, Micronutrient deficiencies (MND) represent a widespread global health challenge, contributing to increased morbidity, mortality, and impaired physical and cognitive development, particularly in low- and middle-income countries like India. Micronutrient deficiencies (MND) impact approximately 2 billion individuals globally, contributing to significant morbidity and mortality1. The National Family Health Survey-5 (NFHS-5) reveals that 57% of Indian women aged 15-49 are anaemic, with anaemia affecting 59% of adolescent girls and 31% of adolescent boys2. The NFHS-5 data also indicates that 25% of Indian men aged 15-49 years are affected by anaemia. The Comprehensive National

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Nutrition Survey (CNNS) 2016-2018 provides critical insights into micronutrient deficiencies in India. The data reveals that around 31% of children between 10-19years were vitamin B12 deficient and about 24% of them were vitamin D deficient3. Additionally, a significant portion of the population suffers from iron deficiency, with 58% of women and 53% of children affected by anaemia. The survey also highlights widespread deficiencies in zinc, vitamin A, and calcium, especially among vulnerable groups like children and women of reproductive age.

A 2021 meta-analysis of 270 studies identified vitamin D deficiency as the most common micronutrient deficiency in India, affecting 61% of the population, followed by iron (54%), vitamin B12 (53%), folic acid (37%), and iodine (17%)4.

Vitamin D deficiency is another widespread issue, with a 2018 review suggesting that most of the studies reported a prevalence of 80%-90% Vitamin D deficiency in the Indian population5. Selvarajan et al. (2017) reported a widespread vitamin D deficiency across various demographic groups in India, including children, the elderly, and menopausal women, affecting both urban and rural populations. They found that 70-90% of Indians suffer from low vitamin D levels, despite the country's abundant sunlight6. This deficiency is primarily attributed to reduced outdoor activity due to lifestyle changes and urbanization and the frequent use of sunscreen and umbrellas. Additionally, inadequate dietary intake of vitamin D-rich foods, low calcium consumption, and a high intake of phytate-rich foods contribute to the widespread deficiency7. Vitamin D deficiency is associated with numerous health conditions, including osteoporosis, musculoskeletal disorders, and an increased risk of chronic diseases such as cardiovascular diseases, hypertension, diabetes, and cancer and even depression8.

Iron deficiency anaemia (IDA) is particularly concerning due to its negative impact on maternal and child health. Iron deficiency anaemia (IDA) contributes to adverse pregnancy outcomes, including preterm birth, low birth weight, and impaired fetal development9. Moreover, IDA in children has been linked to delayed cognitive development, stunting, impaired fine motor skills and poor mental and physical performance10,11. The Indian Council of Medical Research (ICMR) has reported that IDA is one of the leading causes of nutritional deficiencies and is associated with reduced productivity, particularly in women of reproductive age12.

Micronutrient deficiencies in India is aggravated by inadequate dietary intake, poor absorption, and the high prevalence of infectious diseases that interfere with nutrient utilization4. The gut microbiome is integral to both the absorption and synthesis of micronutrients, influencing their bioavailability. The micronutrient–microbiome axis is bidirectional: on one hand, the gut microbiome relies on micronutrients for growth and function, while on the other, it helps produce essential vitamins (like B and K) and enhances the absorption of minerals such as iron and calcium. Host nutrition and micronutrient supplementation can influence microbiota composition, while the microbiome itself plays a key role in optimizing the bioavailability of these nutrients13.

Several public health strategies have been implemented in India to address micronutrient deficiencies. These include food fortification programs, supplementation, and dietary diversification. Supplementation programs for iron and folic acid have been in the country for decades yet anaemia control is still an intimidating task in India. A review of micronutrient intervention strategies in India over the past decade, focusing on vulnerable populations such as children, pregnant women, and adolescents highlights the effectiveness of dietary supplementation, food fortification, and micronutrient supplementation in addressing deficiencies, particularly for calcium, zinc, iodine, vitamin D, and vitamin A.

Recent interest has focused on the use of micronutrient premixes—blends of essential vitamins and minerals—in improving micronutrient intake across populations. Micronutrient premixes are gaining attention as a potential solution to address multiple micronutrient deficiencies simultaneously. Recent studies have explored the effectiveness of micronutrient premixes in both supplementing the diet and improving health outcomes in vulnerable groups.

Mohapatra et al. (2020) evaluated the effectiveness of fortified Mid-Day Meals (MDM) in reducing anaemia among school children in Dhenkanal, Odisha. By fortifying school meals with micronutrient powders (MNP) and fortified rice kernels (FRK), the intervention significantly improved anaemia status, with children receiving MNP showing a 1.93 times higher likelihood of

being free from anaemia and a modest increase in hemoglobin levels14.

A study by García-Guerra et al. (2022) compared the effectiveness of three different supplements—syrup, micronutrient powders (MNP), and fortified food (FF)—in improving zinc and iron status among Mexican children aged 6-12 months. The results indicated that MNP and syrup were more effective than FF in addressing deficiencies, with MNP showing a significant reduction in anaemia prevalence15. The higher compliance with MNP, likely due to its flexibility, ease of use, and high caregiver acceptance, contributed to its superior efficacy. One of the key advantages of MNP is its ability to be mixed into small amounts of food without altering taste, which not only enhances nutrient absorption but also ensures better utilization. Additionally, the study suggested that MNP could be a cost-effective alternative to other supplements in public health programs.

The ease of incorporating micronutrient premixes into everyday meals is a major benefit, as it improves user compliance and contributes effectively in reducing micronutrient deficiencies. Another notable advantage of micronutrient premixes is their ability to target multiple deficiencies simultaneously, making them an efficient solution for addressing widespread nutrient gaps. However, despite the promising results from such interventions, clinical evidence specific to India remains limited. Current studies largely focus on vulnerable populations such as young children and pregnant women, leaving a gap in research on the broader population.

In India, a significant proportion of the adult population—both men and women—suffers from micronutrient deficiencies, even in the absence of overt health issues. Given the widespread nature of this problem, there is a growing need for interventions targeting healthy individuals. This study, therefore, aims to evaluate the efficacy and safety of a 4.6 g daily dose of the Good Monk Nutrition Premix. The Nutrition Premix, which combines vitamins, minerals, prebiotics, probiotics, and herbal extracts like ashwagandha and brahmi, is designed to improve gut health, boost energy levels, supports immunity, and address micronutrient deficiencies in a healthy adult population aged 13 to 35 years.

2. Material and Methods

Healthy male and female subjects between the ages of 13 to 35 years with history of micronutrient deficiencies (Vitamin B12, Vitamin D, Iron) and/or gut-related dysfunction (e.g., irritable bowel syndrome, constipation) were included in the study.

Individuals with Serum Vitamin B12 value less than 200pg/mL, serum iron level less than 120 mcg/dL and serum vitamin D level less than 20 ng/mL were included in the study.

2.1 Exclusion Criteria:

Subjects were excluded from the study if they met any of the conditions in Table 1.

Table1. Exclusion Criteria

1.	Current or history of **cigarette smoking** or **alcohol consumption**.
2.	Presence of significant systemic diseases, including hepatic, renal, gastrointestinal, cardiovascular, neurological, psychological, or autoimmune disorders
3.	Presence of any **significant systemic disease** or disorder, such as: • Hepatic, renal, gastrointestinal, cardiovascular, neurological, psychological, or autoimmune diseases.
4.	Use of any **seizure medications** or medications known to affect **immunoglobulin levels**.
5.	Known **history of malignant diseases**.
6.	Chronic **immune disorders** (e.g., HIV) or **autoimmune diseases**.
7.	**Infectious diseases**, such as **HBsAg** positivity.
8.	Recent use (within 1 week) of **antibiotics**, recent vaccinations (within 4 weeks), or **immunosuppressive therapies** within the

past 3 months
9. **Pregnant or breastfeeding females** or females planning to become pregnant during the study period.
10. **Recreational drug use** (e.g., cocaine, marijuana, methamphetamine).
11. Subjects who are **pre-diabetic**, **diabetic**, or have **hypertension** or **hyperlipidemia**.
12. Individuals who have participated in any other **clinical trial** within the past 3 months.
13. Subjects who are **unable or unwilling to comply with the protocol** or cannot sign an Informed Consent Form

The study was approved by the respective Ethics Committees prior to initiation. The study protocol was reviewed and approved by an institutional review board (IRB) or ethics committee to ensure participant safety and compliance with ethical guidelines.

All participants signed an Informed Consent Form (ICF) before enrolment, acknowledging their understanding of the study's procedures, potential risks, and benefits. The study was also registered with the Clinical Trial Registry, India (CTRI), ensuring adherence to regulatory requirements.

2.2 Screening Process:

Subjects were screened for eligibility based on the inclusion and exclusion criteria. The screening process included: a medical history review, a physical examination, blood and urine tests to check for micronutrient levels, liver function, kidney function, and other relevant laboratory parameters. Global assessment scale was used for gut health evaluation. Informed consent was obtained from all participants.

2.3 Enrolment:

A total of 80 subjects were screened, of which 74 subjects were eligible to participate. 6 subjects were disqualified due to abnormal biochemical test results (e.g., abnormal serum glucose, liver function, CRP levels). Additionally, 2 subjects voluntarily withdrew before enrolment for personal reasons. Each eligible subject was assigned a unique Subject ID to maintain confidentiality throughout the study.

2.4 Intervention:

The investigational product Good Monk Nutrition Premix sachets were dispensed to eligible subjects on a first-come, first-serve basis. Each subject was instructed to take two sachets per day—one mixed with their morning or afternoon meal and one mixed with their evening meal—for a total of 120±3 days. The nutritional information per sachet of the Good Monk nutrition premix is given in table 2.

Table 2: Nutrition Information of Good Monk Nutrition Premix (per 2.3g sachet)

Nutritional Information (Approx.)	Per sachet (2.3g)	%RDA for 1 sachet **	% RDA for 2 sachets ##
Energy (kcal)	5	0.2	0.4
Carbohydrates (g)	1.8	-	-
Total Sugars (g)	0.1	-	-
Added Sugars (g)	0.1	0.2	0.4
Dietary Fibre - Prebiotics (g)	1.6	5	11
Protein (g)	0	-	-
Lysine- Protein Building Block (mg)	250	20	26
Total Fat (g)	0	0	0
Sodium (mg)	2.0	0.07	0.2
Bacillus coagulans (CFU)	130 crore	-	-
Vitamin A (mcg)	237	30	47

Table 2: Nutrition Information of Good Monk Nutrition Premix (per 2.3g sachet)

Vitamin B6 (mg)	0.6	30	63
Vitamin B9 (mcg)	40	30	45
Vitamin B12 (mcg)	0.75	34	68
Vitamin C (mg)	16.2	30	41
Vitamin D (IU)	180	30	60
Iron (mg)$	5.6	20	59
Zinc (mg)	1.7	20	20
KSM-66 Ashwagandha (mg)	67.5	15	30
Brahmi (mg)	20	10	20
** %RDA calculated based on ICMR 2020 (10-12 years)			
## %RDA calculated based on ICMR 2020 (Sedentary man)			
Nutrition Information- based on calculated/ tested values			

2.5 Compliance Monitoring:

Participants were asked to record their daily product intake and any missed doses in a diary card. Missed doses were also documented with reasons provided. The study coordinator reviewed the diary cards regularly to ensure compliance with the dosing regimen.

2.6 Safety and Efficacy Assessments:

Efficacy was assessed primarily by Global Assessment Scale Score for gut health, Micronutrient levels in blood (Vitamin B12, Vitamin D, Iron), Changes from baseline to the end of the study were measured and compared using Per-Protocol (PP) populations.

Secondary Efficacy Parameters were immunity status through an Immunoglobulin G (IgG) level test and C-Reactive Protein (CRP) levels. Functional fitness was measured using the 30-Second Chair Stand Test (30CST). Quality of life scores were obtained. Bristol Stool Scale was used for assessing stool consistency.

2.7 Safety Assessments:

A complete physical examination was conducted at each visit, including vital signs (blood pressure, temperature), and body weight. Medical history was reviewed at each visit, and any concomitant medications were documented. Laboratory tests included: Complete Blood Profile (CBP), Liver Function Test (LFT), Renal Function Test (RFT), Micronutrient levels (Vitamin B12, Vitamin D, Iron), Immunoglobulin G (IgG), C-Reactive Protein (CRP), Urinalysis test.

2.8 Statistical Analysis

All hypotheses were tested at a significance level of 0.05 with a 95% confidence interval.

3 Results:

The study aimed to evaluate the efficacy and safety of a 4.6 g daily dose of Good Monk Nutrition Premix for improving gut health, energy levels, immune support, and addressing micronutrient deficiencies in a healthy population aged 13 to 35 years. Patient characteristics are given in Table 3. Key outcomes included subjective measures (e.g., gut health, immunity, and energy) and objective measures (e.g., levels of Vitamin B12, Vitamin D, iron, Immunoglobulin G [IgG], C-reactive protein [CRP]).

Table 3: Baseline Characteristics of the participants

Details	**Patient Characteristics**
Age group	13-35 years
Male	28
Female	44
N (Sample size)	72
Adolescents	17
Adults	55
Vegetarian	42
Non-vegetarian	30

3.1 Gut Health Improvement:

The Global Assessment Scale for gut health comprises of major symptoms of gut abnormalities. The questionnaires related to the particular symptoms (constipation, bloating, abdominal pain, heart burn, diarrhoea, flatulence, acid reflux, nausea, vomiting and altered stool) were asked from the participants and their feedback was recorded. Participants experienced a gradual reduction in the above-mentioned gastrointestinal symptoms from baseline to final visit. The score was observed to be reduced by13.7%, 52.8% and 91.6% at day30, day60 and at day120 respectively. The paired t-test at day 60 and day 120 showed a statistically significant improvement (p-value < 0.0001).

The Bristol stool scale is a graded visual scale of stool density categorized in seven different categories of faeces. (Figure.1) Type1 &2 indicates constipation, Type3 &4 are treated as normal, Type 5 is normal approaching diarrhoea, and Type 6 & 7 show diarrhoea. The Bristol Stool Scale showed marked improvements in stool consistency and bowel movement patterns. At day 120, 94% of participants reported normal stool consistency (Type 3 or Type 4), compared to only 29% at baseline. Improvements in stool consistency and bowel movement patterns were statistically significant across both genders and dietary groups (vegetarian and non-vegetarian) ($p < 0.0001$).

Figure-1 The Bristol Stool Chart

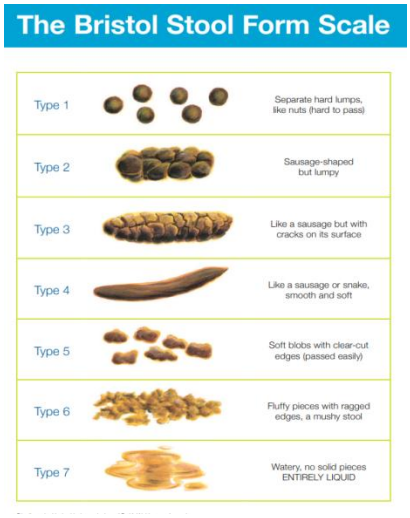


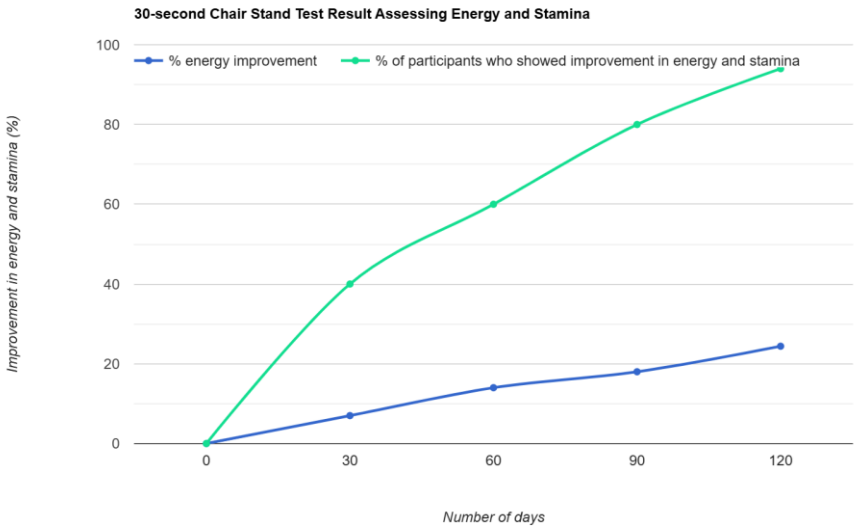
Table 4: Reduction in Gastrointestinal Symptoms and Improvement in Gut Health

Parameter	Baseline	Day 30	Day 60	Day 120	p-value
Global Assessment Scale Score	100%	13.7%	52.8%	91.6%	<0.0001
Bristol Stool Scale (Type 2 Stool)	32%	18%	11%	0%	<0.0001
Normal Stool Consistency (Type 3/4)	29%	51%	61%	94%	<0.0001

3.2 Stamina and Energy:

The Sit-To-Stand Test (also known as 30CST/ 30SCST) was developed to measure functional lower body strength & endurance. 94% of participants demonstrated a 24.4% improvement in energy and stamina, as measured by the 30-Second Chair Stand Test (Sit-to-Stand Test), compared to baseline levels. A statistically significant increase ($p < 0.0001$) in stamina was recorded, confirming a positive effect of the Nutrition Premix on overall energy levels. (Figure.2)

Figure-2 30-second Chair Stand Test Assessing Energy and Stamina



3.3 Immune Function:

Immune function was evaluated using the Immune Status Questionnaire (ISQ). The ISQ is a validated, short and practical scoring form. It consists of seven items related to the immune status of the body. These items are- sudden high fever, diarrhoea, headache, skin problems (e.g., acne and eczema), muscle and joint pain, common cold and coughing. Reduction of these symptoms were observed after administration of the nutrition premix. Participants experienced a reduction in symptoms related to immunity, with improvements in overall immune status. Improvements in immune function were evident, with a 91.5% reduction in infection-related symptoms by Day 120. (Table 5).

Table 5: Immunity Improvement and Reduction in Symptoms

Parameter	Baseline (%)	Day 30 (%)	Day 60 (%)	Day 120 (%)	p-value
Reduction in Immunity Symptoms	0%	33.1%	65.2%	91.5%	<0.0001

The C-reactive protein (CRP) levels and immunoglobulin G (IgG) levels showed a statistically significant reduction (p-value < 0.0001). CRP levels decreased by 45% and immunoglobulin G levels increased by 17.4% in all the participants. CRP, a key marker for inflammation, increases in response to infections and systemic inflammatory processes. The significant reduction in CRP, along with higher IgG levels, suggests that the Nutrition Premix may help improve immune function and reduce inflammation, supporting its potential in enhancing immune health.

3.4 Micronutrient Status:

Vitamin B12 levels improved by 65.4% in 100% participants, and Vitamin D levels showed a 26% increase from baseline to study end ($p < 0.0001$). Iron levels also showed a significant improvement of 30.8% ($p < 0.0001$). (Table 6)

Table 6: Micronutrient Status Improvement

Micronutrients	Baseline Level (Day 0)	Day 120 Levels	% Change	% of participants showing improvement	p-value
Vitamin B12	170.09	281.31	65.4%	100%	<0.0001
Vitamin D	13.3	16.76	26%	93%	<0.0001
Iron	74.95	98.01	30.8%	89%	<0.0001

3.5 Safety and Tolerability

The Nutrition Premix was generally well-tolerated, with no significant adverse effects reported. Vital signs (blood pressure, pulse, respiratory rate) remained stable throughout the study, showing no significant changes from baseline to the study's end. Clinical laboratory tests (hematology, biochemistry, urine analysis) did not show any clinically significant abnormalities, indicating no adverse effects on overall health.

4 Discussion

This study provides compelling evidence for the efficacy and safety of the Good Monk Nutrition Premix in improving gut health, energy levels, immune function, and addressing micronutrient deficiencies in young adults. The Nutrition Premix, which combines essential vitamins, minerals, prebiotics, probiotics, and herbal extracts, represents a promising approach to tackling the widespread issue of micronutrient deficiencies, particularly in the context of India's health challenges.

4.1 Need for Micronutrient Premixes in Healthy Populations

India faces a significant public health burden due to micronutrient deficiencies (MND), with approximately 2 billion people affected globally. While the focus of most micronutrient interventions has been on vulnerable populations—such as children, pregnant women, and the elderly—there is a growing recognition of the need for targeted interventions in the healthy adult population as well. In India, a substantial proportion of the adult population, including young adults, suffers from deficiencies in key nutrients like Vitamin B12, Vitamin D, folic acid, vitamin A and iron, even in the absence of overt clinical symptoms4,16. These deficiencies can have subtle but profound impacts on overall health, including energy levels, immune function, and gut health.

The advantages of premixes lie in their ability to simultaneously address multiple micronutrient gaps, a critical factor in India, where nutrient deficiencies often occur in tandem. Moreover, these premixes are easy to integrate into everyday diets, and does not change the texture and taste of the food, thereby, improving adherence and making them practical for large-scale health interventions15. The results of this study, which demonstrate significant improvements in micronutrient levels, energy, immunity, and gut health, highlight the potential of such interventions in improving the overall health and well-being of young, healthy adults.

4.2 Gut Health Improvement

The significant reduction in gastrointestinal symptoms and improvements in stool consistency and bowel movement patterns underscore the potential benefits of the Good Monk Nutrition Premix on gut health. The use of prebiotics and probiotics in the Nutrition Premix likely played a key role in enhancing gut microbiota diversity and function, which is increasingly recognized as a critical factor for overall health17. The marked improvements in gastrointestinal health, as indicated by the Global Assessment Scale and Bristol Stool Scale, suggest that the Good Monk Nutrition Premix could serve as a valuable intervention for individuals with subclinical gut-related issues, such as mild constipation, bloating, or irregular bowel movements. Given the rise of gut-related disorders in India, particularly among young adults, the

need for effective, accessible solutions like micronutrient premixes is clear.

4.3 Energy and Stamina

The 24.4% improvement in energy and stamina, as demonstrated by the 30-Second Chair Stand Test (30CST), is a noteworthy outcome. This improvement in functional fitness and energy levels highlights the impact that micronutrient supplementation can have on physical health and vitality. Iron deficiency anaemia can affect attention span and memory capacity and can affect upto 30% of work physical performance11. Similarly, Vitamin B12 deficiency can diminish energy levels and cause fatigue18. The Nutrition Premix's positive effects on energy and stamina are likely attributed to the correction of these deficiencies, as well as the potential synergistic effect of the prebiotics, probiotics, and herbal extracts, which can support metabolic function and reduce fatigue.

4.4 Immune Function

The significant reduction in infection-related symptoms and improvements in immune function, as indicated by higher levels of Immunoglobulin G (IgG) and reduced C-Reactive Protein (CRP), demonstrate the Nutrition Premix's potential to support immune health. CRP is a widely recognized biomarker of systemic inflammation, produced by the liver in response to pro-inflammatory cytokines like interleukin-6 (IL-6). Elevated CRP levels have been linked to a higher risk of chronic diseases, including cardiovascular disease, diabetes, and autoimmune disorders19. CRP levels reflect the intensity of inflammation and serve as a predictor of inflammatory processes that contribute to various chronic conditions. Reducing C-Reactive Protein (CRP) levels can enhance immune function by decreasing systemic inflammation, which is linked to a lower risk of chronic diseases and infections20.

The improvement in immune function is especially relevant in the context of India, where infectious diseases and inflammatory conditions are prevalent. The findings suggest that micronutrient premixes could be an effective tool for enhancing immune resilience, not just in individuals with overt deficiencies but also in healthy populations at risk of subclinical deficiencies.

4.5 Micronutrient Status

The improvements in micronutrient status—specifically the 65.4% increase in Vitamin B12, 26% increase in Vitamin D, and 30.8% increase in iron—are consistent with the primary objective of this study: to address prevalent micronutrient deficiencies. These deficiencies are widespread in India, with large segments of the population, especially women, young adults, and children, facing inadequate intake and absorption of these nutrients12. Vitamin D, in particular, is a major concern in India, with nearly 80% of the population experiencing suboptimal levels5. The Nutrition Premix's success in improving micronutrient status further highlights the potential of micronutrient premixes to address these critical deficiencies, thereby contributing to improved overall health and well-being.

4.6 Safety and Tolerability

The safety profile of the Good Monk Nutrition Premix was excellent, with no significant adverse effects reported throughout the study. The absence of clinical abnormalities in vital signs and laboratory tests supports the Nutrition Premix's safety for long-term use. Given the widespread nature of micronutrient deficiencies, ensuring that such interventions are well-tolerated is crucial for public health implementation. The Good Monk Nutrition Premix, with its combination of essential vitamins, minerals, probiotics, and herbal extracts, appears to be a safe and effective tool for addressing micronutrient gaps in a healthy population.

4.7 Limitations of the Study

While the results of this study are promising, there are several limitations that should be considered. First, the study was a single-arm, open-label trial, which means that there was no control group to compare the outcomes against. A randomized controlled trial (RCT) would provide more robust evidence of the Nutrition Premix's efficacy and safety. Second, the study was conducted over a relatively short period (120 days), which limits our understanding of the long-term effects of the Good Monk Nutrition Premix. Long-term follow-up studies would be beneficial to assess the sustainability of the improvements in micronutrient status, gut health, and immune function. Third, the study population was limited to young adults aged 13-35 years, and the results may not be generalizable

to other age groups. Finally, self-reported compliance (via diary cards) is subject to potential bias, and more objective measures of adherence, such as pill counts or biomarkers of compliance, would strengthen the study's conclusions.

5. Conclusion

This study demonstrates that the Good Monk Nutrition Premix is an effective and safe intervention for improving gut health, energy levels, immunity, and micronutrient status in healthy young adults. The Nutrition Premix successfully addressed common micronutrient deficiencies, such as Vitamin B12, Vitamin D, and iron, while also improving functional fitness and immune function. These findings suggest that micronutrient premixes can play a critical role in addressing the widespread issue of micronutrient deficiencies in India, especially in healthy populations. Given the convenience and multi-targeted approach of micronutrient premixes, they have the potential to be a key part of public health strategies aimed at improving overall health outcomes in young adults. However, further research, particularly large-scale, randomized controlled trials, is needed to confirm the long-term benefits and optimal usage of such Nutrition Premixes.

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