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Ayurvedic Insights into Gut Microbiome Dynamics - On *Trayopastambha* Perspective

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ABSTRACT

The gut microbiome is a crucial ecosystem of microorganisms residing in the digestive tract, influencing various aspects of human health. Composed predominantly of bacteria from the Firmicutes and Bacteroidetes phyla, alongside viruses, fungi, and protozoa, it plays essential roles in digestion, nutrient synthesis, immune regulation, and protection against pathogens.[1] This complex community interacts extensively with the host, impacting metabolic processes, immune responses, and even mental health through the gut-brain axis. Maintaining a balanced gut microbiome is pivotal for efficient digestion, nutrient absorption, and overall well-being.[2] Diet profoundly shapes the gut microbiota composition; a diverse diet rich in fiber, fruits, vegetables, and fermented foods promotes microbial diversity and health, while diets high in processed foods and sugars can lead to dysbiosis, characterized by an imbalance in microbial communities.[3] Lifestyle factors such as eating junk food, sleep patterns, stress levels, less physical activity, and medication use also influence the gut microbiome. Chronic stress and inadequate sleep can disrupt microbial balance and compromise gut health. Dysbiosis has been linked to various health conditions, including gastrointestinal disorders, metabolic diseases like obesity and diabetes, autoimmune disorders, allergies, and mental health issues such as depression and anxiety.[4] Integrating knowledge from Ayurveda, which emphasizes the importance of *Trayopastamba* - diet (*Ahara*), sleep (*Nidra*), and regulated lifestyle (*Brahmacharya*) in maintaining gut microbiome health.[5] Ayurvedic practices advocate for a balanced diet tailored to individual *Doshas*, regular sleep patterns, stress management techniques, and a disciplined lifestyle, all of which contribute to maintaining a harmonious gut microbiome. By understanding and nurturing the gut microbiome through these integrated approaches, we can enhance overall health outcomes and prevent various diseases associated with microbial imbalance.

Key words: *Gut Microbiome, Trayopastamba, Ahara, Nidra, Brahmacharya*

INTRODUCTION

The human gastrointestinal tract hosts a diverse and abundant microbial community, with more than 100 trillion microorganisms encompassing over 2000 different species residing within the human intestine.[6] This community, which includes symbiotic, commensal, and pathogenic microorganisms, makes the colon one of the most densely populated microbial habitats with 10^12–10^14 microorganisms.[7] The intestinal microbiome encodes over three million genes and produces thousands of metabolites, playing a crucial role in regulating human health. It is involved in digestion, immune homeostasis, colonization resistance against pathogens, and the production of vitamins and short-chain fatty acids. Disruptions in its composition and function can directly impact diseases such as inflammatory bowel disease, type II diabetes, and cardiovascular diseases. Studies have indicated that restoring balance to the gut flora can prevent specific diseases by altering the microbiome's composition and structure. The gut microbiome, comprising bacteria, viruses, fungi, and other microbes, is essential for efficient digestion, nutrient absorption, and immune regulation, with approximately 70% of the immune system housed in the gut.[8] Additionally, the gut-brain axis highlights the connection between gut health and mental well-being,

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influencing mood and cognitive functions. Overall, a balanced gut microbiome is critical for metabolism, weight management, and disease prevention, including diabetes, cardiovascular diseases, and some cancers.[9]

Ayurveda, an ancient system of medicine from India, focuses on the balance between mind, body, and spirit for optimal health. It emphasizes a classical approach to health, natural healing through diet, lifestyle, and herbal remedies. Central to ayurveda are the concepts of *Doshas* - body constitutions (*Vata*, *Pitta*, and *Kapha*), *Tri Dandas* that influence individual health and require personalized approaches. *Trayopastambhas* (*Aahara*, *Nidra*, and Brahmacharya) serve as crucial pillars or external factors that support life. Each *Upastambha* is intricately linked to internal factors known as *Stambhas*, which sustain and shape life itself. Neglecting any *Upastambha* can disrupt the corresponding Stambha, leading to imbalance across the entirety of life. Therefore, the *Upastambhas* are tools within our control to maintain the equilibrium of life. The principle of *Trayopastambha*, or the three pillars of life, is fundamental in *Ayurveda*. The first pillar, *Aahara* (diet), emphasizes the importance of consuming fresh, natural, and wholesome foods tailored to one's dosha. The concept of a “sattvic” diet promotes purity and balance. The second pillar, *Nidra* (sleep), highlights the quality and duration of sleep as crucial for physical and mental rejuvenation. Proper sleep practices are recommended to maintain health and enhance bodily functions and mental clarity. The third pillar, *Brahmacharya* (regulated lifestyle), advocates for a disciplined lifestyle that includes self-control, proper conduct, and a balanced approach to physical and mental activities. While *Charaka* identifies *Brahmacharya* as one of these pillars, other ancient texts like *Astanga* Hrudaya and *Sangraha* mention it as *Abrahmacharya*,[10] highlighting the importance of balanced living practices for enduring health and well-being.

Bachground - *Trayopastambha*

Trayopastambha, described in the *Nirdesha Chatushka* of *Charaka Samhita's Sootrasthana* within the *Trisreshaneeya Adhyaaya*, refers to the three fundamental pillars essential for achieving life's threefold goals. The term combines "*Traya*," meaning three, and "*Upastamba*," denoting a supporting pillar. These pillars - *Aahara* (diet), *Nidra* (sleep), and *Brahmacharya* (celibacy or moderation) - are likened to robust supports crucial for sustaining and nurturing vitality throughout life.[5] *Charaka* emphasizes their pivotal role in promoting strength and complexion until old age, provided they are diligently practiced with wisdom (*Yukti*). These pillars are considered essential for maintaining and promoting overall health and well-being.[5] The three pillars are:

1. *Aahara* (Diet)

Refers to the food and nutrition consumed by an individual. *Ayurveda* places significant emphasis on the quality, quantity, and timing of food intake, advocating for a balanced diet tailored to an individual's dosha (body constitution). *Aahara* is believed to provide the necessary nourishment and energy to sustain bodily functions and maintain health.

Ayurveda emphasizes the profound connection between diet (*Ahara*) and medicine (*Aushadha*) in maintaining health. According to *Charaka Samhita*, diet is one of the three pillars (*Trayopastambha*) of life, essential for sustaining overall health.[5] It is detailed in four chapters (*Swasthya Chatushka*) that emphasize the quantity (*Matra*) of food, which influences strength (*Bala*), radiance (*Varna*), vitality, and immunity (*Oja*).[11] The effectiveness of diet depends on the strength of *Agni* (metabolism), which varies with seasons (*Rutu*).[12] Ayurveda categorizes food quantity (*Ahara Matra*) into *Sarvagraha* (total amount consumed in a meal) and *Parigraha* (individual portions like chapati, daal).[13] It stresses the consumption of *Shadrasa* (six tastes) for balanced nutrition. Modern nutritionists focus on macronutrient proportions (carbohydrates, fats, proteins), corresponding to *Parigraha* in *Ayurvedic* terms. *Ayurveda* also outlines eight principles (*Ahara Vidhi*) governing food consumption, including nature, processing, combination, proportion, region, time, rules of consumption, and the consumer.[14] Unlike conventional medicine, Ayurveda asserts that any

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substance, whether medicine (*Aushadha*) or food (*Ahara*), must undergo *Vipaka* for metabolism and manifestation of its effects.[15] The primary difference lies in quantity and function: food (*Ahara*) is consumed in larger amounts and provides overall nutrition, whereas medicines (*Aushadha*) are taken in smaller quantities, targeting specific actions without providing comprehensive nutrition. *Acharya Kashyapa* has even referred to food (*Anna*) as a super medicine (*Mahabhaishyajya*).[16]

In *Ayurveda*, diet is considered the most critical factor for health. It is believed that a well-balanced diet tailored to one's *Dosha* can prevent and treat diseases. Ayurveda emphasizes the consumption of fresh, natural, and wholesome foods. Specific dietary guidelines are provided based on an individual's *Dosha*, promoting the concept of “Sattvic” foods which are pure, easily digestible, and beneficial for the mind and body.

2. *Nidra*

In *Ayurveda*, *Nidra* (Sleep) is recognized as a cornerstone of physical and mental well-being, crucial for rejuvenation and balance. Derived from the Sanskrit root "*Nidi Kutsyaayaam*," *Nidra* signifies a state where mental faculties and sensory functions are subdued, facilitating rest and sleepiness. *Ayurveda* categorizes sleep into three types: *Tamasika Nidra*, associated with heaviness and lethargy due to *Kapha* dosha imbalance; *Rajasika Nidra*, marked by restlessness and active dreaming linked to Pitta dosha imbalance; and *Satvika Nidra*, reflecting tranquility and purity associated dosha balance. The onset of sleep is influenced by increased *Tamas Guna* (inertia) and *Kapha Dosha*, with variations in sleep patterns corresponding to predominant *Gunas* in individuals.[5]

Regular and quality sleep is celebrated in *Ayurveda* for its numerous benefits, including stress reduction, improved sleep quality, enhanced concentration, emotional healing, and fostering a balanced mind-body connection. Adequate *Nidra* contributes to appropriate weight, better complexion, enthusiasm, and the alertness of sensory organs. Alongside *Ahara* (diet) and Brahmacharya (celibacy), *Nidra* is deemed vital for maintaining physiological health, supporting tissue repair, metabolic balance, and mental clarity.[17]

Ayurveda emphasizes maintaining a regular sleep routine, practicing relaxation techniques, and adapting lifestyle habits according to one's dosha constitution to optimize sleep health. Proper sleep bolsters immunity, reduces stress and anxiety, and prevents mental illness. Conversely, *Nidranasha* (insomnia) can lead to digestive impairments, depression, mental illness, and fatigue. Disciplinary daily and dietary regimens, along with purification measures and natural medicines, help alleviate symptoms of *Anidra* (insomnia), ensuring holistic health and well-being.

3. *Brahmacharya*

In *Ayurveda*, *Brahmacharya* (Regulated Lifestyle) is revered as a fundamental aspect of personal development and well-being. It embodies the disciplined activities of the body and mind, encompassing self-control, moderation, and ethical conduct. According to *Chakrapani*, *Brahmacharya* involves the regulated control of the senses (*Indriya*) and mind (*Manas*) to achieve *Brahma Jnana* (spiritual knowledge).[18] While it is commonly associated with abstinence from sexual activity (maithuna), engaging in sexual activity with proper discipline also aligns with the principles of *Brahmacharya*. This path, aimed at attaining moksha (liberation), includes maintaining control over the senses' activities (*Karmendriya*) and supporting the longevity of life. *Dalhana* defines *Brahmacharya* as the regulated activity of the senses, emphasizing it as the best *Pathya* (suitable conduct) for maintaining health. It embodies principles like *Ahimsa* (non-violence) and the *Yamas* (ethical disciplines) such as *Satya* (truthfulness) and *Asteya* (non-stealing). The *Bhagavad Gita* describes *Brahmacharya* as the contemplation or study of the *Paramatma* (Supreme Soul). It involves studying the *Vedas* under a *Guru*, practicing *Ahimsa*, and *Shareera Tapas* (austerities of the body), and avoiding actions harmful to the body and mind. Thus, *Brahmacharya* is considered the most important *Upasambha*, influencing all *Stambhas* and other *Upastambhas* throughout life.[19]

A regulated lifestyle is crucial for maintaining balance and preventing disease. *Ayurveda* encourages

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individuals to follow a daily routine (*Dinacharya*) and seasonal routines (*Ritucharya*) to harmonize with natural cycles. This includes maintaining a regular routine, engaging in physical activity, practicing yoga and meditation, and ensuring a balanced approach to work, rest, and leisure activities. These practices promote longevity and prevent lifestyle-related ailments, fostering physical health and mental tranquility. *Brahmacharya*, therefore, is not merely about celibacy but encompasses a comprehensive lifestyle of discipline, ethical conduct, and balance, aimed at achieving overall well-being and spiritual enlightenment.

Gut Microbiome

The gut microbiome refers to the diverse community of microorganisms, including bacteria, viruses, fungi, and protozoa, residing in the human gastrointestinal tract, playing crucial roles in various bodily functions and significantly impacting overall health.[20] Comprising mainly bacteria from the Firmicutes and Bacteroidetes phyla, the microbiome also includes viruses, fungi like Candida species, and protozoa such as Entamoeba and Giardia.[21] The gut microbiome aids in digesting complex carbohydrates, proteins, and fats, producing short-chain fatty acids (SCFAs) like acetate, propionate, and butyrate, essential for colon cell energy and anti-inflammatory properties, and synthesizes vitamins such as vitamin K and certain B vitamins.[22] It interacts with the immune system, helping to develop and regulate immune responses, distinguishes between pathogens and benign microorganisms, and provides a barrier against pathogenic bacteria by competing for nutrients, attachment sites, and producing antimicrobial substances. The microbiome communicates with the central nervous system through the gut-brain axis, influencing mood, cognition, and behavior via neurotransmitters, immune signalling molecules, and direct neural connections.[23]

Factors Influencing the Gut Microbiome

A diet rich in fiber, fruits, vegetables, and fermented foods promotes a diverse and healthy gut microbiome, while a diet high in processed foods, sugars, and unhealthy fats can negatively impact microbial diversity and composition.[24] Lifestyle factors like stress, sleep patterns, physical activity, and hygiene practices influence the gut microbiome, with chronic stress and poor sleep leading to changes in gut microbial composition.[25] The gut microbiome evolves throughout life, starting from birth, with genetic factors also playing a role in determining its composition and diversity.[26]

Dysbiosis and Health Implications

Dysbiosis, an imbalance in the gut microbiome characterized by a loss of beneficial bacteria, an overgrowth of potentially harmful microorganisms, or reduced microbial diversity, has been Antibiotics can disrupt the gut microbiome by killing beneficial bacteria, potentially leading to dysbiosis (an imbalance in the microbial community), and other medications, such as proton pump inhibitors and nonsteroidal anti-inflammatory drugs (NSAIDs), can also affect the gut microbiome linked to various health conditions, including gastrointestinal disorders like inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), and celiac disease.[27] Metabolic disorders such as obesity, type 2 diabetes, and metabolic syndrome are linked to alterations in the gut microbiome affecting energy metabolism and insulin sensitivity. Dysbiosis has been implicated in autoimmune diseases like rheumatoid arthritis, multiple sclerosis, and allergies, and imbalances in the gut microbiome are associated with mental health disorders such as depression, anxiety, and autism spectrum disorders, highlighting the importance of the gut-brain axis.[28]

Table 1: Summarizing disorders related to food, sleep, and *Brahmacharya* (regulated sexual behaviour) in relation to the gut microbiome[29]

Disease / Condition	Food Impact	Sleep Impact	Brahmacharya Impact
IBS	High-fat, low-fiber diets worsen symptoms.	Poor sleep quality worsens symptoms.	Stress reduction supports gut health.

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IBD	Processed foods and low fiber exacerbate inflammation	Sleep disturbances exacerbate inflammation.	Emotional balance influences immune responses.
Obesity	Refined sugars and low fiber promote dysbiosis.	Sleep disturbances contribute to weight gain.	Balanced lifestyle promotes metabolic health.
Type 2 Diabetes	Sugars and unhealthy fats worsen insulin resistance.	Sleep disturbances impair insulin sensitivity.	Stress reduction supports glucose metabolism.
Cardiovascular Diseases	Saturated fats and processed foods increase risk.	Sleep disorders worsen cardiovascular health.	Lifestyle moderation impacts cardiovascular health.
Autoimmune Diseases	Low nutrients and additives worsen conditions.	Sleep disturbances exacerbate immune dysfunction.	Emotional balance influences immune responses.
Allergies	Processed foods and low fiber increase susceptibility	Poor sleep quality impairs immune function.	Stress reduction supports immune function.
Mental Health Disorders	Poor diets exacerbate conditions.	Sleep disturbances affect mental health.	Stress reduction supports mental well-being.

Ayurvedic perspectives and modern insights on gut microbiota in relation to *Ahara*: a comprehensive approach to obesity, liver disorders, and diabetes[30]

In *Ayurveda*, obesity (*Sthaulya*) is attributed to dysfunction in *Meda Dhatu* (adipose tissue) due to improper *Agni* (metabolic energy). This condition is exacerbated by a vicious cycle involving excessive consumption of sweet (*Madhura*) and lipid-rich (*Sneha*) foods, coupled with insufficient exercise. Treatment typically involves dietary management, lifestyle adjustments, and cleansing therapies like *Vamana* (induced emesis), *Virechan* (induced purgation), and *Basti* (enema).[31] Modern research has highlighted a potential link between gut microbiota and obesity. Studies have shown that obese individuals tend to have a higher ratio of Firmicutes to Bacteroidetes bacteria in their gut. While certain microbial communities may contribute to increased energy harvest and weight gain, the exact role of gut microbiota in obesity remains multifactorial and complex.[30]

Liver disorders in *Ayurveda* are often attributed to faulty dietary habits and improperly administered emesis or purgation therapies, leading to tissue metabolism dysfunction (*Dhatu Vaishamya*).[32] These disorders are categorized as *Santarpan Janya*, originating from unhealthy lifestyle practices. Treatment typically involves gut-cleansing therapies that aim to restore balance and target harmful residues through *Amapachana* (metabolizing toxins). Modern research underscores the significant interplay between gut microbiota and chronic liver diseases. Factors such as gut barrier integrity, immune responses in the liver to gut-derived factors, and bile acid signalling are critical in understanding and addressing conditions like non-alcoholic fatty liver disease (NAFLD). Dysbiosis, characterized by imbalances in gut microbial communities, can contribute to hepatic steatosis (fatty liver) and inflammatory processes associated with liver diseases. For instance, in conditions like alcoholic liver disease and primary sclerosing cholangitis, distinct shifts in gut microbiota compositions have been observed. Recent studies have also highlighted the role of gut microbiota in regulating hepatic gluconeogenesis, with probiotics showing potential in influencing these metabolic processes positively.[30]

In *Ayurveda*, *Madhumeha*, akin to diabetes, is considered a type of *Prameha* characterized by pathological changes in urine, mirroring pre-diabetic symptoms. The pathogenesis of *Prameha* correlates closely with the urinary system (*Mutravaha Samsthana*) in *Ayurvedic* physiology, where urine's main function is to manage moisture balance resulting

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from metabolic imbalances. *Ayurvedic* treatments for diabetes focus heavily on restoring homeostasis, particularly through therapies like emesis and purgation aimed at the gastrointestinal tract. Dietary modifications and exercise further underscore the importance of gut health in managing diabetes. This comprehensive approach highlights the crucial role of metabolic equilibrium in controlling diabetes.[33] Type-2 diabetes (T2D) is a widespread metabolic epidemic associated with disturbances in gut microbial composition. Studies suggest that microbial translocation and low-grade inflammation in surrounding tissues contribute to insulin resistance and metabolic dysfunction. Species such as Prevotella copri and Bacteroides vulgatus have been implicated in these processes, reflecting complex gene-environment interactions that influence metabolic complications like obesity and T2D.[30]

Discussion

Ayurveda offers a profound perspective on diet, emphasizing its pivotal role in maintaining health through the lens of the gut microbiome. Central to Ayurvedic dietary principles is the concept of Ahara, or food, which is considered the cornerstone of health. According to Ayurveda, consuming a balanced diet that includes all six tastes - sweet, sour, salty, bitter, pungent, and astringent - ensures nutritional diversity and supports the balance of the three *Doshas: Vata, Pitta,* and *Kapha*. A diverse diet rich in fiber and phytochemicals supports a diverse gut microbiome, which is associated with better health outcomes. Fresh, seasonal foods are nutrient-dense and less likely to contain additives that could disrupt the gut microbiome. Traditional Ayurvedic practices include consuming fermented foods like yogurt and buttermilk, which provide beneficial bacteria (probiotics) crucial for gut health. Fibrous foods such as fruits, vegetables, whole grains, and legumes act as natural prebiotics, promoting the growth of beneficial gut bacteria. Recent scientific research aligns with Ayurvedic principles, highlighting the importance of a diet rich in fiber, polyphenols, and healthy fats for gut microbiome health. Integrating Ayurvedic wisdom with modern dietary insights offers a comprehensive approach to supporting gut health, emphasizing the benefits of diverse, fresh, and seasonal foods, probiotics, digestive spices, and mindful eating practices while minimizing processed foods and additives that can disrupt microbial balance.[34] Dysbiosis in the gut microbiome is associated with several diseases related to poor dietary choices. For instance, irritable bowel syndrome (IBS) can be exacerbated by high-fat and low-fiber diets. Inflammatory bowel diseases (IBD), such as Crohn's disease and ulcerative colitis, worsen with diets high in processed foods and low in fiber. Obesity and type 2 diabetes are linked to dysbiosis influenced by diets high in refined sugars and unhealthy fats. Cardiovascular diseases, including coronary artery disease and stroke, are associated with dysbiosis influenced by diets high in saturated fats and processed foods. Autoimmune diseases, allergies, and mental health disorders like anxiety and depression can be exacerbated by poor dietary choices that promote dysbiosis.[35] Non-alcoholic fatty liver disease (NAFLD) and colorectal cancer are also linked to dysbiosis influenced by diets high in sugars, unhealthy fats, red, and processed meats.

Sleep plays a crucial role in maintaining a healthy gut microbiome, which profoundly impacts overall health, including digestion, immunity, and mental well-being. Poor sleep is associated with diseases like cancer, diabetes, and Alzheimer's, and cytokines.[36] IL-1β and IL-6, linked to sleep physiology, fluctuate with sleep loss and gut inflammation. Research shows that sleep deprivation can alter gut microbiome composition, with high sleep quality associated with beneficial gut bacteria and improved cognitive performance.[29] Ayurveda regards sleep (*Nidra*) as one of the three pillars of health, essential for restoration and rejuvenation, emphasizing regular sleep patterns, quality sleep, and a conducive sleep environment. Modern research has elucidated how circadian rhythm disruptions and poor sleep quality impact gut microbiome diversity, potentially leading to dysbiosis. Stress-induced sleep disturbances can further disrupt gut microbiome composition, affecting gut

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permeability, immune function, and overall health. Integrating Ayurvedic practices with modern insights, such as stress management techniques and a supportive diet, offers a comprehensive approach to supporting gut microbiome health through optimal sleep hygiene. Dysbiosis related to sleep disturbances is linked to various diseases, including IBS, IBD, obesity, type 2 diabetes, autoimmune diseases, allergies, anxiety, depression, heart disease, Alzheimer's, and Parkinson's disease, highlighting the importance of sleep in maintaining gut and overall health.[37]

Lifestyle factors play a critical role in shaping the gut microbiome, influencing its composition and function in ways that can significantly impact overall health. Smoking, for example, has been shown to alter the gut microbiota by increasing the prevalence of Bacteroides-Prevotella species, which can elevate the risk of conditions such as Crohn's Disease.[38] Lack of exercise similarly affects the gut microbiome, with sedentary lifestyles being linked to shifts in microbial populations that can contribute to obesity and metabolic disorders. Stress impacts the gut-brain axis, leading to changes in the gut microbiota, including a reduction in beneficial Lactobacillus species, which can exacerbate conditions like irritable bowel syndrome (IBS). Geographical location and diet also have profound effects on gut microbial diversity. Environmental factors such as pollution and airborne toxins can reach the gut via mucociliary clearance, potentially increasing the incidence of inflammatory bowel diseases (IBD). Travel and exposure to different environments further influence the gut microbiome. Traveling to overseas destinations can increase the risk of contracting infectious diseases, which may lead to long-term gastrointestinal issues like IBS. Poor sanitary conditions and inadequate hygiene in some areas can facilitate the spread of infectious agents, altering gut microbial populations. Circadian disorganization due to travel, shift work, or other lifestyle changes can also disrupt gut health, leading to alterations in the microbiome.

Overall, these lifestyle factors - ranging from personal habits to broader environmental influences - collectively shape the gut microbiome, underscoring the intricate relationship between our lifestyle choices and gut health.

In addition to *Trayopastamba*, *Tridanda*, the *Doshas* - *Vata*, *Pitta*, and *Kapha* - impact gut health differently. *Vata* governs movement and can cause bloating and constipation when imbalanced, managed with warm, cooked foods and healthy fats. Pitta regulates digestion and may lead to acidity and inflammation, managed with cooling foods and stress reduction. *Kapha* governs structure and can cause sluggish digestion and mucus buildup, managed with light, spicy foods and stimulating activities. Balancing *Doshas* with specific foods, activities, and herbs supports gut health and overall well-being.

Agni, or digestive fire, is crucial for health, governing digestion, absorption, assimilation, and transformation of food into energy and nutrients. It supports immunity, mental clarity, detoxification, and energy levels. Balanced *Agni* ensures regular appetite, healthy skin, good energy, regular bowel movements, and mental clarity. Imbalanced *Agni* leads to irregular appetite, indigestion, fatigue, and mental fog. Ayurveda recommends eating according to one's *Dosha*, consuming freshly prepared foods, avoiding overeating, incorporating digestive spices, regular detox practices, adequate sleep, and stress management to maintain balanced *Agni*.

In *Ayurveda*, *Trayopastambha* - comprising *Ahara* (diet), *Nidra* (sleep), and *Brahmacharya* (regulated conduct) - is integral to maintaining a balanced gut microbiome and overall health.[11] *Ahara* emphasizes consuming a diverse diet rich in fiber, phytochemicals, and all six tastes to support the balance of *Vata*, *Pitta*, and *Kapha Doshas*. This promotes a healthy gut microbiome, crucial for digestion and immunity. *Nidra*, emphasizing quality sleep, aids in maintaining gut microbiome diversity and function, supporting mental well-being and immune health. *Brahmacharya* promotes balanced conduct, reducing stress and supporting gut health through mindful practices. Integrating these principles with modern insights help in nurturing gut microbiome health and overall well-being.

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Conclusion

The gut microbiome is a complex and dynamic ecosystem that plays a fundamental role in maintaining health. Understanding the intricate relationships between the gut microbiome and various aspects of health can lead to better strategies for preventing and treating numerous conditions.[39] Promoting a healthy gut microbiome through diet, lifestyle, and mindful use of medications is essential for overall well-being.[9] The concept of *Trayopastambha*, which refers to the three pillars of life in Ayurveda - *Ahara* (diet), *Nidra* (sleep), and *Brahmacharya* (regulated conduct) - holds significant importance in the current era due to its integrative approach to health and well-being.

Integrating the principles of *Trayopastambha* into modern life offers a comprehensive approach to health that addresses physical, mental, and emotional well-being. By focusing on diet, sleep, and regulated conduct, individuals can achieve a balanced and healthy lifestyle.[40] *Ahara* (Diet) influences the gut microbiome by providing balanced nutrition essential for microbial health, while *Nidra* (Sleep) supports it by reducing stress and promoting metabolic balance. *Brahmacharya* (Regulated Lifestyle) further fosters a healthy gut microbiome through stress reduction, physical activity, and ethical conduct, ensuring overall well-being and harmony in the body. Emphasizing preventive measures rather than reactive treatments aligns with modern public health goals, reducing the incidence of lifestyle-related diseases and improving overall quality of life. Ayurveda promotes harmony with nature, seasonal eating, and mindful living, which are increasingly relevant in the context of environmental sustainability and personal well-being.

Ahara emphasizes nutritional balance, promoting a diet that includes all six tastes and supports digestive health, thus preventing lifestyle-related diseases such as diabetes, hypertension, and obesity. Nidra underscores the importance of quality sleep for mental clarity, emotional stability, and cognitive function, crucial in an era marked by stress, anxiety, and digital overload. Proper sleep is also vital for bodily repair, immune function, and overall vitality, enhancing focus, creativity, and productivity. *Brahmacharya* advocates energy conservation and mindful behaviour, fostering healthy relationships and reducing stress and anxiety.

Moderation in all activities, including sexual conduct, promotes emotional well-being and reduces the risk of sexually transmitted infections. By integrating fresh, seasonal foods into the diet, maintaining a regular sleep schedule, practicing relaxation techniques, and exercising moderation in daily activities, individuals can achieve health and well-being. Hippocrates, the father of modern medicine, is famous for his expression, “All disease begins in the gut.” Similarly, Ayurveda places great importance on proper diet and digestion, as well as on all aspects of lifestyle.

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