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**ROLE OF DIET AND LIFESTYLE FACTORS ON GUT MICROBIOTA AND ITS IMPACT ON HUMAN HEALTH**

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**Abstract-** In nutrition, diet refers as the food and drink that is regularly consumed by an individual (or a group). During a particular therapy of a disease management of a particular health condition, the diet may be controlled, or restricted i.e. one that meets the physical needs of an individual. Diet play a major role in the healthy life .In modern scenario, fast food, fried foods, and most bakery foods, street food are consumed is trends, but this foods are unhealthy and it kills the good bacteria of the intestine and create a barrier in absorption of nutrients .Gut microflora are the very important for the overall health .Healthy lifestyle habits are also important for the digestive health, cardiovascular diseases, and gut health and also improved the quality of life. Dietary fiber is improved the intestinal health and promote the growth of healthy bacteria of the gut.Fermanted foods are the good for intestinal health. plants based diet are the good source of dietry fiber ,minerals rich in vitamins,etc,which is important for the good microbiota health.Polyphenols rich foods ,and probiotic foods are the good for the digestive tract and intestinal health. Overall eating a colorful fruits and vegetables are the promote the good health.

Modern era treating the intestinal diseases and gastrointestinal diseases and digestive diseases etc use of medicine as well as diet and lifestyle is most important part. If accepting a healthy diet and lifestyle, in future almost many diseases are in controlled and come in the fast recovering stage

**KEYWORD-** Diet, Lifestyle, Gut Microbiota, polyphenols and probiotic foods, human health

Introduction- Gut-microbiota (GM) is considered a hidden metabolic organ of the body1.providing.Gut microbiome or gut flora are the microorganism that lives in the digestive tracts of human .Complex microbial communities are the integral part of the ecosystem and our bodies in health and diseases1,. Balanced diet and healthy lifestyle with calorie restriction (CR) promote the growth of healthy microbiota, leading to longevity by down-regulating inflammatory responses.

Micrbiota is defined as “The assemblage of the living microorganism present in a defined environment”2. Gut bacteria plays a important role in the human health like supplying nutrients synthesizing vitamin K, aiding in the digestion of cellulose and promoting angiogenesis and enteric nerves function3.The gut microbiota produced a variety of nutrients including a short-chain fatty acids,vitamine B and vitamin K4. Recent studies have suggested that the intestinal microbiota is plays an important role in modulating risk of several chronic diseases, including inflammatory bowel disease IBD, obesity, type 2 diabetes, cardiovascular disease CVD, and cancer5. At the same time, it is now a understood that diet plays a significant role in shaping the microbiome and human good health.

Diet and lifestyle is an important factors that is a known to a contribute in the development of human diseases3,4,5. It is well established that the poor diet play a an active role in exacerbating the metabolic diseases, such as obesity, diabetes and hypertension GB stone etc.5, .The contribution of dietary factors is fermented by the human gut microbiome.In this review evidence regarding the dietary fiber intake gut microbiota regulation, and modification in human health.

Dietary fiber is a CHO in plant food and legumes, which have been prominent in human diet for several of years6. The contribution of dietary factors to the inflammatory conditions such as the IBD inflammatory bowel diseases, multiple sclerosis and arthritis poorly defined.

A western diet has been associated as the pro inflammatory, in the contrast to the traditional dietary pattern that are associated as being a anti inflammatory7 .This may be due to the direct effect of the nutrients on immune cell functions.

Diet may also the affect composition and function of the gut microbiota which consequently affect the composition and the function of gut microbiota, which consequently affect the immunity. The gut bacteria play a vital role in overall health and disruption to the gut microorganism; have been a many health problem7. In present scenario faulty lifestyle habits like poor sleep, exessesive alcohol consumption restrictive poor diet and inactiveness are harms the gut health.

**Signs of an unhealthy gut**

Many parts of modern life can affect gut microbiome, including:

* high stress levels
* little sleep
* eating a [western diet](https://www.healthline.com/health-news/modern-diet-and-gut-health) high in processed and high in sugary foods
* intaking [antibiotics](https://www.healthline.com/health-news/antibiotics-can-kill-healthy-gut-bacteria-heres-what-to-eat-to-counter-that)

This in turn may affect other aspects of the health, such as:

* immune function
* hormone levels
* weight
* development of diseases8

### 1. Upset stomach

Stomach disturbances can be signs of an unhealthy gut. They included-

* gas
* [bloating](https://www.healthline.com/health/abdominal-bloating)
* [constipation](https://www.healthline.com/health/constipation)
* [diarrhea](https://www.healthline.com/health/diarrhea)
* Heartburn9

A balanced gut will be have the less difficulty a processing food and eliminating the waste, likely leading to symptoms.

### 2. A high sugar diet

A diet high in [processed foods](https://www.healthline.com/health/food-nutrition/processed-foods-to-avoid) and sugars can decrease the amount of “good” bacteria and diversity in gut.

This may lead to the increased inflammation in the body. [Inflammation](https://www.healthline.com/nutrition/sugar-and-inflammation#section1) can be precursor to the several diseases, including cancer8,9.

### 3. Unintentional weight changes

Gaining or losing weight without changing the diet or exercise habits may be a sign of an unhealthy gut. Imbalanced gut health can impair the body’s ability to absorbed a nutrients, regulate blood sugar level, and stored the fat8,9.

Weight loss may be caused by the malabsorption because of [small intestinal bacterial overgrowth (SIBO)](https://www.healthline.com/health/sibo). On the other hand, weight gain may be the caused by [insulin resistance](https://www.healthline.com/nutrition/insulin-and-insulin-resistance) or increased inflammation.

### 4. Sleep disturbances or constant fatigue

An imbalance in gut bacteria may be linked to fragmented sleep and short sleep duration, which may lead to chronic fatigue8.

### 5. Skin irritation

Skin conditions like [psoriasis](https://www.healthline.com/health/psoriasis) may be a related to the types of bacteria present in the gut10. Lower concentrations of the beneficial bacteria may impact the body’s immune system.

This, is may lead to conditions that affect the organs, including the skin.

### 6. Autoimmune conditions

Several [studies](https://www.tandfonline.com/doi/full/10.1080/17474124.2018.1517044) have found the connections between the gut and the immune system. Unhealthy gut may increase the systemic inflammation and alter the proper functioning of the immune system11.

This can lead to the [autoimmune diseases](https://www.healthline.com/health/autoimmune-disorders), where the body attacks itself rather than the harmful invaders.

### 7. Food intolerances

[Food intolerances](https://www.healthline.com/nutrition/common-food-intolerances) are the result of difficulty digesting certain foods11,12. This is different than a [food allergy](https://www.healthline.com/health/allergies/food-allergy-sensitivity-difference), which is caused by an immune system reaction to certain .Food intolerances, like lactose intolerance, may be caused by a poor quality of bacteria in the gut12. This can be lead to the trouble digesting the trigger foods and symptoms like:-

* bloating
* gas
* diarrhea
* abdominal pain
* [Nausea](https://www.healthline.com/health/nausea)

Improve the gut health with healthy diet and lifestyle13

Many type of factors, including healthy diet and lifestyle is affect the gut health. That is

Eat healthy varieties of food-Eating variety of food is promote a good health and decreased the risk of diseases. Keeping the diet interesting with different flavor and texture14.

Food and vegetables are the best sources of the nutrients which promote the healthy micobiome

High fibrous food which is good for gut microbiota15-

* Raspberries
* Artichokes
* Green pea
* Broccoli
* Lentils
* Beans
* Whole grains
* Apples
* Figs

Consume fermented food-Fermented food are the rich sources of lactobacilli bacteria that can promote the good health15,.Fermanted soybean milk is also promote the growth of beneficial bacteria like Bifidobacteria and Lactobacilli15,16 .It decreases the other quantity of harmful bacteria .

Includes plant based diet-Plant based diet have grown increasingly across the globe, mainly for human health and environmental benefits17. Many studies are identifies the relationship between the plant based diet and decreases the risk of CVD, cardiovascular diseases, obesity, Metabolic diseases, and other health issues.

Includes food rich in polyphenols-Diet rich in polyphenols represent the wide variety of compounds that include in fruits vegetable,wine,tea,vergin olive oil cocoa products and varieties of chochalates,which is mostly derivatives of flavones catechins and phenolic acids etc and possess a diverse the such properties such as antioxidents,antiapoptosis,anti aging,anti-carcinogen,anti inflammation,antiatherosclorosis improvement the endothelial functionas well as inhibition of cell proliferation activity18.

Probiotics rich diet- Due to WHO defines probiotics “live microorganisms which administered in adequate amounts afford a human health benefits on host19. Probiotics are the microorganisms (like lactobacillus and Bifid bacterium) that when consumed (as food or a dietary supplement) maintains or restores the beneficial bacteria to the digestive tract. Few benefits of probiotics20

* Weight loss
* Improved digestion
* Enhance immune system
* To healthier skin
* Reduced the risk of cardiovascular diseases, metabolic diseases etc

Probiotics can help maintain a healthy balance of healthy bacteria in your body. Healthy bacteria support your immunity and help to control inflammation. Adding foods rich in the probiotics to support overall health-

Diet and lifestyle affect on health and its futuristic trends in medical sciences- The consumption of fermented foods and probiotics to emerging applications of gut microbiota transplantation, the health benefit of manipulating the human gut microbiota has been exploited for millennia21. Despite this history, recent technological advances are cracking the capacity for targeted the microbial manipulation as a novel therapeutics.

Gut microbiota is the very important part of the human body .Healthy diet with lots of vegetables and fruits, and such type of polyphenols, and probiotic rich foods are important for the gut health and overall health22.

**Plant**-based diets versus conventional diet- Conventional diets are generally the low-fat diets and most of them have the some macronutrient composition: 30% fat, 50% CHO and 20% of protein23.

**Vegetarian:** It is also known as the ovo-lactovegetarian, this diet included the all plant-based foods, allowing eggs and dairy products also24.

**Vegan:** This diet that consists of plant-based foods only excluded the meat, dairy, eggs, and honey25. Follows this lifestyle do so for ethical or environmental reasons, and other lifestyle modifications are typically included in addition to the dietary changes.

**Pescatarian:** This is a largely vegetarian diet that also includes sea foods26.

**Whole-foods, plant-based (WFPB):** Extremely it is similar to a vegan diet; this diet eschews the ethical baggage and focuses on the human health aspect27. High in fruits, vegetables and whole grains which low in fat.

**Flexetarian:** This is a broad term used in vegetarian or plant-based diet, but allow for some meat, dairy, and seafood on occasion28.

Conventional diet-Conventional diets are made using the pesticides, chemical herbicides29. Even as the conventional foods seems to possess chemical residues from the pesticides, herbicides and other chemical used in the cultivation of these plants ,conventional foods are still considered safe for the consumption fruits such as the apple ,bananas, and citrus fruits produced using conventional farming methods30.

**Methods-** In this study, all data have been carefully collected from Pubmed, Google scholar. We have been reviewed many research papers on gut microbiota, probiotic diet, polyphenols diet. Which is help to improve digestive health and increased healthy gut microbiota. We were reviewed paper on diet, futuristic trend in medical sciences, healthy lifestyle approach of healthy gut microbiota, to overcome the various types of diseases, and healthy lifestyle. Total 34 articles were reviewed here.

**DISCUSSION -** Consumption of polyphenols-rich fruits and vegetables, and beverages derived from plants, such as cocoa, red wine and tea, represents the diet beneficial to human health31. Some dietary polyphenols rich foods possess antioxidative and anti-inflammatory properties,. These phenolic substances have the ability to abrogate various biochemical processes induced or mediated by the tumor promoters30,31. Some dietary polyphenols also induce apoptosis in premalignant or cancerous cells, and suppress growth and proliferation of various types of tumor cells via induction of apoptosis of a specific phase of the cell cycle30. In the other words, “gut health” may be a new way of marketing such as weight loss tips, which go hand-in-hand with crazy fad diets32. Rather than counting a calories and drinking green juices to reduce belly fat. The gut micro biome plays a very important role in your gut health by helping control digestion and benefiting the immune system and many other aspects of the health33. Gut is also a body gets rid of metabolic waste and toxins. However, unhealthy gut, the body will struggle to rid itself of those toxins. If this occurs, it can cause a many issues, including chronic fatigue, chronic illnesses and inflammation throughout the body .Another little-known fact that is 70% of immune cells can be found in our gut. Gut-associated lymphoid tissue (or GALT) and the gut microbiome make a great team in the battle against tiny (pathogens) that could make the sick34.

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