Narrative Review Article

What is the Relationship Between Fast Foods, Balanced Diets and Mental Health?

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ABSTRACT

The relationship between diet and mental health has become a central focus of modern scientific research. This literature review examines how balanced diets and fast foods differently influence mental health, emphasizing three main mechanisms: the gut microbiome, essential nutrient availability, and cellular energy metabolism. A diverse gut microbiome supports regulation of the gut-brain axis, while nutrient deficiencies are associated with increased susceptibility to depression and anxiety. Given the rising prevalence of mental health disorders, nutritional psychiatry offers an accessible and affordable avenue of potential treatment, however many people still underestimate or neglect the importance of diet and nutrition. This review highlights the negative effects of fast food and Western dietary patterns alongside the benefits of balanced nutrition, underscoring the necessity for future longitudinal studies that minimize confounding variables, contain homogenous definitions of terms such as anxiety and depression, and adopt identical methodologies for coherence and applicability. However, this literature review confirms the correlation between diet and mental health, as fast foods have negative cognitive effects and increased susceptibility to anxiety and depression, while balanced diets can mitigate these effects.

Keywords: mental health; nutrition; diet; fast foods; gut microbiome; brain; vitamins; balanced diet

INTRODUCTION

Mental health is a state of mental well-being that enables people to cope with the challenges of life, realize their abilities, learn well, work well, and contribute to their community (1). The two most prevalent mental health disorders to date are anxiety and depression (2). According to the National Institutes of Health, depression is defined as persistent sadness and loss of interest in activities that were once enjoyable (3). Anxiety is defined as a feeling of fear, dread, and uneasiness (4). Nearly 1 in every 5 (18.2%) adults reported feelings of anxiety in 2022, almost a 3% increase from 15.6% in 2019 in the U.S. News & World Report (5). This trend is increasing steadily despite being underestimated as a global crisis. Although around 50% of people with mental health problems are aware of their struggle, only 7% are able to get adequate care (6). This is due to the intangible nature of mental health concerns. Many people perceive mental health disorders to be less serious compared to physical injuries or disease. This is further compounded by the fact that most treatments are inaccessible and not always effective.

According to the Sleep Foundation, one reason why mental illness rates have increased is because people are shifting to a more technological environment

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(7). With increased use of electronic devices such as computers, phones, or television, people are more prone to less sleep, especially teenagers and adolescents (8, 9). An additional risk factor associated with mental health disorders is nutrition quality (Table 1). Balanced diets provide a variety of nutrients to support optimal health and well-being. In contrast, fast foods are often less nutrient dense and pose negative risks to health (10, 11). The increase in reliance on fast and fried foods has been linked to higher mental illness incidence rates (12). Unhealthy eating increases risk of obesity, type 2 diabetes, heart disease, and cancer, but also discretely increases risk of mental illness (13, 14).

Foods have a direct impact on the brain through nutritional deficiencies, the gut-brain axis, and cellular energetics (15). An example of a type of food that affects the brain are fast foods, foods that are usually high in calories but low in essential nutrients that support and maintain brain health. These nutritional deficiencies can negatively impact neurotransmitter balance and brain function (16). Additionally, the gut-brain axis which entails the communication network between the digestive system and the brain connects emotional and cognitive centers to intestinal functions through nerves such as the vagus nerve (17). The gut contains millions of neurons, and in fact, there are more neurons in the gut than in the spinal cord, proving evidence of the interconnectedness between the brain and the gut (18).

Nutritional psychiatry describes the concept that connects what you eat to the function of your brain (19). The aim of this research paper is to illustrate the potential connections between the type of food consumed and mental health outcomes and the potential causative pathways by which nutrition affects mental health outcomes.

MENTAL HEALTH

Mental health refers to a person's emotional, psychological, and social well being and it affects how people think, feel and behave (20). With anxiety disorders, people fight with excessive worrying, fear, and nervousness which interferes with everyday life. Similarly, depression is a mood disorder causing feelings of persistent sadness and hopelessness. Anxiety disorders affect over 300 million people and depression affects more than 280 million people globally (21). As a result of anxiety and depression, suicide is the second leading cause of death among individuals aged 10-14 and 25-34 (22, 23). This age range covers the majority of the adolescent years, which is a pivotal developmental timeframe.

Table 1. Overview of dietary patterns, nutritional features, and mental health outcomes identified in the reviewed literature

Dietary Pattern	Key Nutrients/Features	Reported Mental Health Outcomes	Studies
Western/Fast Food Diets	Ultraprocessed foods, saturated fats, refined sugars, and processed foods with little essential nutrients.	Poorer mental health outcomes, possibly high rates of depression and anxiety, reduced microbial diversity	Monteiro *et al*., 2013; LaFata *et al*., 2024; Ozojide *et al*, 2025; Mazloomi *et al*., 2023
Balanced Diet	Diets with diverse types of fiber, vitamins, minerals, and healthy fats- very nutrient rich.	Improved mental health outcomes, possibly lower rates of anxiety and depression, increased microbial diversity.	Gómez-Pinilla, 2008; Jacka, 2017; Zhu *et al*., 2020
Diet Supporting Diverse Gut Microbiome	Higher microbial diversity due to a variety of foods with more fiber and lower cortisol influence.	Stronger resistance against stress, more stable connection between gut and brain, and better mental stability.	Berding *et al*., 2021; Zhu *et al*., 2023; Kim *et al*., 2021
Stress-Influenced or Nutrient-Limited Diet	Higher levels of cortisol, lower diversity of nutrients and thus lower microbial diversity (leaky gut).	Higher risks of anxiety, depression, and stress leading to poor mental health.	Ashworth-Preece *et al*. 1997; Anglin *et al*., 2013; Alvarez *et al*., 2021

Different types of diets have different reported effects on mental health due to particular differences in key nutrients and features. This table provides a clear association between dietary patterns and outcomes in mental health.

In adolescents, the brain is still developing and maturing, specifically the prefrontal cortex, which is the part of the brain that handles decision making and regulating emotions (24). Whereas adults may be more emotionally equipped to handle social pressures, adolescents still developing their decision-making skills may struggle with this, causing them to be more prone to more intense reactions and emotions (25). Moreover, puberty rapidly increases hormones which affect emotions while these teens are beginning to form their identity and social belonging (26). Furthermore, with the increased use of technology, teens are more prone to cyberbullying and comparison, contributing to the high rates of depression and anxiety (27). Other risk facts include location and types of environments. Specifically, areas with high crime rates, lack of social support, pollution, poverty, and unemployment can often be linked to increased stress (28).

Current treatments for mental illness include therapy, medication, and lifestyle changes (29). However, each of these methods have critical setbacks and limitations that many people fail to recognize. For example, a barrier to accessing treatment is that current options such as psychotherapy may be expensive and inaccessible (30). Furthermore, medication can have side effects or delayed results which could reduce adherence to the treatment regimen (31). Lastly, though lifestyle changes can be impactful in shifting routine, level of activity, and happiness, these changes can be hard to maintain without adequate support, resulting in patients resigning their efforts and returning to old habits that might not be as beneficial (32). These limitations highlight the need for more effective therapies. Nutritional psychiatry presents an additional avenue for therapeutic advancement (33). In fact, research in this area has identified a positive correlation between dietary intake of certain types of nutrients and improvement of mental health status (34). Therefore, to understand nutritional psychiatry and its potential to mediate mental health, we must fully grasp how different dietary patterns -particularly fast foods versus balanced diets- can impact mental health.

FAST FOODS VS BALANCED DIETS

Balanced diets consist of whole grains, fruits/vegetables, protein, healthy fats, minerals and vitamins, and enough water (35). On the other hand, fast foods contain large amounts of refined sugar and carbs, unhealthy saturated and trans fats, artificial preservatives, and low micronutrient content (36). Consistent consumption of fast foods prevent the consumer from obtaining a balanced variety of nutrients and vitamins. Additionally, consuming fast foods increase chronic inflammation, impair the gut brain axis, and can contribute to fatigue and mood swings (37). In studies conducted by Mazloomi *et al* and Bhave *et al* investigating associations between the brain and ultra processed food consumption, the researchers report multiple experiments that confirm that fast food consumption is correlated to mental illness (38, 39). Mazloomi *et al* conducted a study using a dose-response meta-analysis of 260,385 participants across 26 studies while Bhave *et al* examined 20,243 participants. The combination of the similar results that was extracted from these two studies -both experimental and a systematic review- highlight the correlation between ultra processed food, or fast food, and mental illness (Table 1). The researchers claimed that high ultra-processed food intake in conjunction with a sedentary lifestyle led to amplified odds of anxiety in adolescents in Brazil (40). All three of the studies above utilized a questionnaire format for obtaining information about nutrition intake and habits. Although this was a uniform approach, the method through questioning to obtain data may sometimes be inaccurate as people are prone to bias and memory issues influencing data. Nevertheless, other studies mentioned in the systematic review claimed that there was an association between ultra-processed food intake with an increased risk of incident depression diagnosis or depressive symptoms. A study on the prospective association between ultra-processed food (UPF) consumption and incident depressive symptoms in the French NutriNet-Sante cohort conducted by Julia *et al* of 20,380 women and 6350 men over 5.4 years, reported 2221 incident cases of depressive symptoms (41) (Table 1). They utilized the Cox proportional hazards model to determine the relationship between UPF consumption and incident depressive symptoms. The Cox proportional hazards model is a statistical method in survival analysis that looks into the relationship between dietary factors and the time until a specific health event occurs (time of development of a disease, time until recovery, etc) (42). The conclusion from the study on UPFs and incident depressive symptoms conducted by Julia *et al* was that UPF consumption was positively associated with the risk of incident depressive symptoms. However, Julia *et al* did acknowledge that confounding factors could interfere with this association. In all, these studies

conducted research through various methodologies, using the Cox proportional hazards models or using questionnaires, which must be homogenized in future studies. However, despite different methods, and possible confounding variables, they all had parallel results and conclusions over the relationship between fast foods and mental illness.

Analogously, C. Gomez-Donoso *et al* conducted an experiment exploring Ultra-processed food consumption and the incidence of depression in a Mediterranean cohort using 14,907 Spanish university graduates (43). The participants reported no incidence of depression at baseline and the researchers followed them to identify incidence of depression over a mean of 10.2 years. They collected data on dietary intake using a 136 question food frequency questionnaire. In this study Ultra-Processed Foods (UPFs) were defined as food and drink products ready to eat, drink, or heat and made predominantly or entirely from processed items extracted or refined from whole foods or synthesized in the laboratory. Data on incidence of depression was collected 2 years after the study was concluded using a questionnaire. This study also used the Cox proportional hazards model to determine depression incidence. After the follow up with the study participants, 608 cases of medically-diagnosed depression were identified. Participants that consumed the highest UPFs had a higher risk of developing depression than participants who consumed much less UPFs. Thus, this study also concluded a positive association between UPF consumption and depression risk (Table 1).

On the other hand, Glabska D *et al* conducted a literature review titled Fruit and Vegetable Intake and Mental Health in Adults and they found that studies suggest that a healthier diet contributes to a more optimistic lifestyle and less stress (44). Within this paper, analyzing 61 studies, the majority of studies had a trend that was those fruits and vegetables, even processed fruits and vegetables, have a positive influence on mental health. For instance, according to O'Neil *et al*, the Mediterranean diet in 2 controlled trials was used as a therapeutic tool because of the amount of healthy vitamins and minerals in the diet (45). The researchers found that an increase in consumption of fruits and vegetables by one portion a day leads to a 0.133-unit improvement in the GHQ-12 scale, a scale that reliably detects psychological distress and short-term changes through either a questionnaire or a screening tool. The consumption of 7-8 servings of vegetables and fruits led to a 0.24-unit increase in life satisfaction. Taken together, diets rich in fruits and veggies were positively associated with better mental health outcomes (Table 1). Though these studies uncovered associations between diet and mental health they also had significant limitations that prevent a complete understanding of the relationship. For example, across studies definitions of what constitutes a balanced diet were inconsistent. Further research should cover all types of mental health disorders in diverse population samples using consistent methodology to uncover the direct relationship between a balanced diet and mental health. Conclusively, these studies illustrate associations between diet and mental health. To understand why the association between balanced diets and mental health exists, researchers have begun examining biological pathways that intertwine how we eat to how we feel. The umbrella in which most potential causative pathways lie under is the gut-brain connection. Thus, it is essential to understand how the gut-brain connection functions and the different ways it communicates.

GUT-BRAIN CONNECTION

The gut microbiome is the community of microorganisms (bacteria, viruses, fungi, archaea, and protozoa) that reside in the gastrointestinal tract (predominantly in the large intestine) (46). Diet, antibiotics, age, geography, stress, and probiotics can all influence the diversity of the gut microbiome in a variety of ways (47). Microbiota diversity can increase with nutritious diets while high-fat, high-sugar, and ultra processed diets that are energy dense rather than nutrient dense can decrease in diversity. Higher diversity is associated with a greater number of beneficial bacteria producing compounds like serotonin or short chain fatty acids that regulate mood. The gut microbiome helps with digestive and metabolic support through fermentation of short chain fatty acids and synthesizing vitamins aiding in these processes (48). Additionally, the gut microbiome regulates and trains the immune system to identify harmful pathogens and viruses (49). The gut microbiome also independently protects against pathogenic microbes by regulating intestinal pH to suppress their growth (50).

The gut microbiome produces neurotransmitters such as serotonin, dopamine, and acetylcholine with bacterial enzymes through amino acids or other dietary compounds that enter the gut. These neurotransmitters allow neurons to communicate with other neurons

or muscle cells. In the gut, these neurotransmitters regulate digestion, motility, secretion, immune activity, and mood (51-53). The Enteric Nervous System is responsible for transmitting serotonin and the other neurotransmitters to regulate appetite and mood. The human Enteric Nervous System (ENS) is located within the walls of the gastrointestinal tract and contains approximately 400-600 million neurons (54). The ENS functions independently of the CNS. Dysbiosis in the gut microbiome when consuming less nutrient diverse foods can cause disruptions in the pathway between the ENS and the brain (55, 56). Due to the fact that the ENS is responsible for transmitting serotonin and other neurotransmitters to regulate appetite and mood, consistent consumption of energy dense foods can dysregulate this function causing an increase in stress and pro-inflammatory signals linked to depression and anxiety (57-59).

The gut-brain axis is a multidimensional and bidirectional communication network between the brain and the gut. Neural pathways are a type of pathway within the gut-brain axis, using the ENS (Enteric Nervous System) and the vagus nerve as primary highways to connect the gut to the brain. The vagus nerve is the main component of the parasympathetic nervous system regulating the immune response, digestion, heart rate, and mood. The vagus nerve detects microbiota metabolites (small molecules produced during metabolism releasing energy) and gives this information to the central nervous system (60). For example, short chain fatty acids are produced by microbial fermentation of dietary fiber and activates FFAR3 (free fatty acid receptors) on enteroendocrine cells in the gut. As a result, the cells release PYY (Peptide YY) and GLP-1, stimulating vagal afferents transferring signals to the brain, such as signals reducing appetite, improving insulin sensitivity, and influencing mood regulation (61). On the other hand, the ENS regulates the immune response, and detects nutrients. The ENS and vagus nerve collaborate with each other to assess stimuli in the gut that are then transmitted to the brain.

Another pathway for gut-brain communication is the endocrine pathway, through the HPA axis and gut hormones. The HPA axis (Hypothalamic Pituitary Adrenal Axis) is the body's central stress response system that provides the core regulation of the stress response, and can significantly impact the microbiota–gut–brain axis (62). Specifically, the HPA axis responds to psychological and physical stress, eventually releasing cortisol. High levels of cortisol have negative effects on the gut and immune system. Cortisol increases gut permeability, resulting in "Leaky Gut," weakening the intestinal lining that protects the inside of the intestine from the rest of the body (63). This allows undigested food particles, toxins, and microbes to leak into the bloodstream. Additionally, high levels of cortisol suppresses the gut microbiota, inhibiting growth of beneficial microbes and can promote the growth of pathogenic bacteria ultimately reducing diversity (64). On the other hand, enteroendocrine cells on the lining of the gut can sense nutrients and release hormones into the blood and signal the brain. For instance, hormones like Ghrelin, PPY, GLP-1, and Serotonin all affect the brain's response to consumption (65).

The third pathway linking the gut to the brain is through the immune pathway. The gut microbiome contains 70-80% of the immune cells. A healthy gut promotes anti-inflammatory immune cells (66). However, when poor diet, stress, and antibiotics come into play, this can cause dysbiosis (an imbalance microbiome), damaging the gut lining and increasing gut permeability (or leaky gut as mentioned previously). This leaky gut causes toxins like LPS to enter the blood stream and because of this, immune cells produce pro inflammatory cytokines. Cytokines are actively transported across the blood brain barrier and influence the brain by releasing secondary messengers into the brain, activate the brain immune cells, and increase production of pro-inflammatory mediators within the CNS. Additionally, these cytokines can pass the blood brain barrier because the barrier becomes more permeable during inflammation, causing the junctions between the barrier cells to loosen (67). As a response to the cytokines, the brain reduces serotonin production and can cause symptoms of depression, anxiety, and fatigue (68, 69). Now that we understand these three pathways underlying the gut-brain connection, the potential causative pathways that researchers have posed will be easier to comprehend.

POTENTIAL CAUSATIVE PATHWAYS

Associations between diet and mental health outcomes have already been established (70). However, the intricate pathways that connect diets and mental health are not clearly established, along with the question: how are they connected? As mentioned earlier, the gut microbiome and the brain have significant correlation through the gut brain axis.

Di*et al*so has a significant role in gut microbiome composition, function, and diversity (71). Thus, because there is a relationship between the gut microbiome and different diets, and there was an existing relationship between the gut microbiome and the brain, it must be concluded that diets have an effect on the brain, altering mood or brain chemistry. Additionally, a study on the Diet and the Microbiota-Gut-Brain Axis: Sowing the Seeds of Good Mental Health by Berding *et al* also recognizes the connection between nutrition and mental health (72). Although these two studies have the same findings, both the studies conducted by Ross *et al* and Berding *et al*l argue for further studies to be conducted. Specifically, they both underscore the understudied use of whole-dietary approaches and the lack of evidence from clinical populations.

Vitamins and minerals are important cofactors in the synthesis and metabolism of neurotransmitters. They state that artificial and natural sweeteners have no "clear" effects on the microbiota, invalidating previous research that report detrimental effects to the microbiota composition. Fruits and vegetables lead to increased microbial diversity and function. Specifically, they increased the abundance of beneficial bacteria, such as Bifidobacterium and Lactobacillus. These bacteria are proven to relieve anxiety and depression by lowering cortisol, synthesizing neurotransmitters, and producing short chain fatty acids (73, 74). Fruits and vegetables are also shown to reduce harmful bacteria like E. coli. The study reports that the western diet decreased bacterial diversity and eradicated the beneficial microbes. The high-fat, omnivore type diet decreased microbiota diversity and beneficial bacteria (75). Moreover, the study also underscores the vagus nerve as a key player when transmitting microbiota-originating signals to the brain (76). The vagus nerve is stimulated by gut microbes, activating neurotransmitters which can bind the receptors on vagal afferent neurons (77). Due to the omnivore type diet reducing bacterial diversity, it can directly correlate to signals that cause neuroinflammation sent to the brain via the vagus nerve. For instance, Lipopolysaccharide (LPS) bacteria is found in processed meats, dairy products, and vagal stimulation by this bacteria will result in neuroinflammation, altering brain function and inducing depressive-like or anxious symptoms as explained in the immune pathway connecting the gut microbiome and the brain (78). In all, these studies illustrate that specific foods or diets can affect the gut microbiome, sending specific signals to the brain. The labeling of fast foods as processed meats and dairy products is ambiguous, but fast foods are partly consisting of certain dairy and processed meats.

Secondly, another potential pathway diet can affect the brain is through particular nutrient deficiencies. When abiding by a strict diet that does not cover all the essential vitamins and minerals, the deficiencies will cause harm for the body and brain development. A study on nutrition and brain development in early life by Prado *et al* demonstrated that brain development may be compromised when nutrient deficiency is severe to moderate (79). Since brain development (especially during adolescence) is linked to increased risk of anxiety and depression, it can be concluded that nutrient deficiencies are directly linked to an increased risk of anxiety and depression (80) (Table 1). According to Prado *et al*, iron deficiency, an essential structural component of the hemoglobin molecule, is associated with poor mental and motor development, with poor cognition and school achievement (79). It has been established that proper nutrition must be available for adolescence, but what about in adults? Anglin *et al*, concluded that low vitamin D concentration is associated with depression (81). They conducted a systematic review of observational studies and noticed that one particular study displayed that lower vitamin D levels were found in people with depression compared with controls, and that there was an increased odds ratio of depression for the lowest vs. highest vitamin D categories in the cross sectional studies. In a study on the role of vitamin C in stress-related disorders by Moritz *et al*, the researchers noticed that a vitamin C-deficient diet reduces serotonin levels and its breakdown in the cerebral cortex and the striatum in the brain (82). As mentioned previously, serotonin is a neurotransmitter that regulates mood, sleep, appetite, digestion, pain, and memory. Low levels of serotonin are linked with depression and anxiety, while a healthy balance of serotonin results in tranquility, stability, and more focus (83, 84). Across multiple studies, researchers have shown that sustaining adequate intake of essential nutrients throughout one's life is crucial, as deficiencies can disrupt brain development, neurotransmitter function, and mood regulation, ultimately increasing the risk of anxiety and depression.

DISCUSSION

Increasing research in the field of nutritional psychiatry suggests a potential connection between

dietary intake and mental health outcomes. The western diet mostly consists of fast foods that are energy dense and do not contribute any nutritional value. Increased consumption of these foods has been linked to poor mental health outcomes. However, the causative relationship between diet and mental health disorders remains understudied. The objective of this systematic review is to illustrate the contrasting impacts of fast foods and balanced diets on mental health and raise awareness to the importance of nutrition in this context.

Though there have been strides made in the field to decipher the exact connection between nutrition and mental health, several limitations exist that prevent our complete understanding of this relationship. In the study conducted by Julia *et al*, they acknowledged that a "wide range" of potential confounders could have impacted the results. In particular, because of the vast range of participants and their own unique lifestyles, different factors like sleep, exercise, or sunlight exposure may have influenced the relationship between diet and depression incidence making it difficult to determine a causative connection between mental health and diet. Additionally, other limitations are apparent that impede our ability to accurately uncover the causative pathway between diet and mental health outcomes. These limitations include: variation in methodology and lack of uniformity when defining terms. For instance, a study looked at the association between depressive symptoms and eating or health behaviors in adolescents and another on temperament of infants. Participants were administered a questionnaire in the study concerning adolescents while the other study presented a questionnaire filled out by a guardian or primary caregiver. This deviation in the way questionnaires are filled out can cause incorrect assumptions and is an example of the lack of unity when it comes to these experimental studies. For future studies, deviation can be mitigated by having a ubiquitous approach in methods for each and every experiment with limited leniency. Finally, there was no uniform standardization practice that defined terms homogeneously across all studies, presenting an urgent need for researchers to conform to the same definition for terms like "depression" or "anxiety." In sum, despite the progress towards understanding the relationship between food intake and mental health, the research has many limitations that prevent thorough understanding of this relationship between different diets and mental health. For instance, as mentioned above, studies are prone to confounding variables (inevitable when facing this particular kind of research) and others may have disparate methods of collecting information. Thus, in all, many studies present the need for further research and improved methods to investigate the intricate relationship between diet and the brain.

Unfortunately, it is very difficult to investigate the relationship and make the findings generalizable because of concerns over ethics and limited awareness on this subject. To circumvent the limitations mentioned above, future experimental studies should utilize larger and more diverse sample sizes and standardize definitions surrounding diet quality. Standardization of methodology to effectively and accurately capture mental health is also recommended. The DSM-5 is a validated tool that provides specific, criteria-based definitions of detailed diagnostic criteria for mental disorders or terminology imperative for diagnosis of diseases which ensures researchers to use identical definitions for terms in their study. This reduces variability in how mental health conditions are defined across studies, homogenizing definitions of the terms like "depression" and "anxiety." Additionally, instead of relying on traditional surveys and questionnaires, further research should explore the potential use of biological markers linked to food and certain diets to objectively collect data and limit bias. Furthermore, encouragement of similar naming practices can also lead to interdisciplinary collaboration for future research and can also be coherent to the public. Additionally, confounding factors such as exercise, sleep, sunlight exposure, etc that can impact mental health should be adjusted for in the analysis of the data. It is important to note that most of these studies are prone to recall bias as they typically utilize surveys to collect data. However, the survey is a valuable tool for data collection as there are restrictions that prevent studying humans in a controlled environment. Finally, the research reviewed here suggests further longitudinal studies with minimal confounding variables, homogenous terms, and identical methods.

Nutrition and mental health are connected through the gut-brain axis, highlighting the importance of maintaining the integrity and function of the gut microbiome. When the gut microbiome is limited in diversity, or tight junctions that make up the lining of the gastronomical tract are weakened, studies show that this negatively affects the brain and makes the individual more prone to anxiety and depression. The gut microbiome can be negatively impacted by an imbalanced diet (fast food and the western diet in this

case) because they do not provide sufficient nutrients and promote the growth of harmful bacteria (Table 1). Stress can also damage gut integrity, as studies have shown that increased cortisol levels increase gut permeability (leaky gut), allowing harmful substances to potentially cross into circulation. Stress also lowers microbial diversity, ultimately weakening the gut-brain axis and disrupts signalling. This can in turn negatively affect the brain, causing a cyclical pattern of stress, depression, and anxiety and a less diverse gut microbiome (Table 1). On the other hand, balanced diets can improve the diversity of the gut microbiome and promote the growth of beneficial bacteria (Table 1). Diversity of the gut microbiome is vital to resilience, balance, and functionality in the body. Due to the wider range of microbes, the immune system will be able to distinguish between harmless and harmful agents strengthening protection. Additionally, there will be better digestion correlated with the diversity of the gut microbiome because there will be numerous functions that the microbial species have, such as breaking down specific fibers, producing a certain type of vitamin, etc. Specifically, the more microbial species and diversity, the more neurotransmitters that influence brain function and well-being are sent through the gut-brain axis as mentioned before. Moreover, a more diverse gut will lead to better gut-brain communication because a diverse microbiome supports the production of neurotransmitters like serotonin. This may lead to lower risk of anxiety and depression while promoting mood and cognitive function. These findings indicate that balanced diets have a positive effect on mental health while fast foods and the western diet have the opposite effect.

Based on the research discussed here, balanced diets may lower rates of anxiety and depression by increasing gut diversity and fulfilling nutrient requirements while fast food diets may increase susceptibility to anxiety and depression by limiting gut diversity and lacking vital nutrients. Future studies are needed to fully establish the relationship between the diet and brain function and by extension mental health through more longitudinal studies addressing limitations that include disparate definitions, variability in methodologies, and lack of adjustment for confounding variables.

CONCLUSION

The research of nutritional psychiatry has been increasing as mental health and diet patterns are becoming increasingly connected. Especially as mental illness rates and fast food reliance has increased, this relationship is necessary for a plausible solution. This literature review aimed to determine the relationship between balanced diets and fast foods and mental health. Further studies must be conducted to better understand and expand upon our knowledge on nutritional psychiatry, as it can open new avenues for treatments. However, this literature review confirms the correlation between diet and mental health, as fast foods have negative cognitive effects and increased susceptibility to anxiety and depression, while balanced diets can lower these effects and decrease susceptibility to anxiety and depression.

CONFLICT OF INTEREST

The author declares no conflicts of interest related to this work

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