

REVIEW

Relationship between dietary habits and mental health across the lifespan: A narrative review

Xiaoping Li^{1†}, Hailing Ji^{2†}, Yue Xu^{1†}, Yuting Qiu¹, Shiyu Chen¹, Lailing Du¹,
Jianguo Zhang^{3*}, and Xinling Zhang^{1*}

¹Key Laboratory of Artificial Organs and Computational Medicine in Zhejiang Province, Shulan International Medical College, Zhejiang Shuren University, Hangzhou, Zhejiang, China

²Department of Laboratory Medicine, Weihai Medical District, the 970th Hospital of the Joint Logistics Support Force of the Chinese People's Liberation Army, Weihai, Shandong, China

³Hangzhou Huijian Medical Technology Co., Ltd, Hangzhou, Zhejiang, China

Abstract

There is a well-established link between dietary patterns and mental health. Nutritional intake provides essential nutrients crucial for physiological functions and significantly influences psychological processes and emotional states through multiple mechanisms. Infancy is a critical period for forming dietary preferences, with family environment and parental emotions significantly influencing dietary habits and emotional states. Dietary nutrients directly impact emotions and behavior during childhood, and good dietary habits are crucial for mental health. In adolescence, the relationship between dietary habits and mental health becomes more complex. Nutritional deficiencies and unhealthy dietary habits can lead to mood swings and psychological issues. In adulthood, academic pressure and lifestyle changes make the impact of dietary habits on mental health more pronounced; a healthy dietary pattern is associated with lower levels of anxiety and depression. In middle age, increasing work and family pressures can be mitigated by a healthy diet, which improves mood. In old age, dietary quality is closely related to mental health, with good dietary habits helping to reduce the risk of depression and cognitive decline. This paper emphasizes the importance of establishing healthy dietary habits at all life stages and offers intervention recommendations, providing a professional reference for promoting mental health.

Keywords: Across the lifespan; Diet; Mental health; Depression; Health promotion

[†]These authors contributed equally to this work.

***Corresponding authors:**

Jianguo Zhang
(medicare@qq.com);
Xinling Zhang
(Xinlingz_201803@zjsru.edu.cn)

Citation: Li X, Ji H, Xu Y, *et al.* Relationship between dietary habits and mental health across the lifespan: A narrative review. *Health Psychol Res.* 2026;14(3):026120061. doi: 10.36922/HPR026120061

Received: March 17, 2026

Revised: June 7, 2026

Accepted: June 15, 2026

Published online: July 2, 2026

Copyright: © 2026 Author(s). This is an Open-Access article distributed under the terms of the Creative Commons AttributionNon-Commercial 4.0 International (CC BY-NC 4.0), which permits all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Publisher's Note: AccScience Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

1. Introduction

During infancy, individuals begin to develop specific food preferences.¹ Berridge² characterized this preference as a “food reward,” serving as the predominant driving mechanism in food selection for most individuals. The intricate relationship between dietary habits and mental health has been well-documented. Dietary habits refer to habitual patterns of food and beverage consumption, including food choices, intake frequency, and long-term dietary behaviors. Mental health is defined as a state of psychological well-being characterized by emotional, cognitive, and social functioning, including the presence or absence of mental disorders such as depression and anxiety.³ Nutritional intake

not only provides essential nourishment for individuals but also modulates psychological functioning and emotional states through various mechanisms.⁴ Optimizing dietary patterns is posited as a potent and efficacious strategy for addressing psychological issues. From the perspective of health psychology, dietary habits are not only influenced by physiological needs but are also shaped by cognitive, emotional, social, and behavioral factors, highlighting the importance of integrating nutritional interventions with psychological and behavioral strategies to promote mental well-being.⁵ The impact of dietary habits on mental health demonstrates notable variability across different life stages due to distinct physiological and psychological developmental characteristics.⁶ Adequate nutritional intake is critical for brain development, influencing subsequent neural development.⁷ Adolescence, characterized by profound physiological and psychological transformations, sees nutrition playing a pivotal role in growth and psychological resilience. As individuals transition into adulthood, significant changes in lifestyle and sources of stress necessitate adjustments in dietary habits, which can significantly impact emotional regulation. In old age, with the concomitant decline in physiological function and the increase in mental health challenges, the role of diet in mitigating cognitive decline and maintaining mental well-being becomes increasingly prominent. The prevalence of depression and anxiety in contemporary society underscores the importance of dietary interventions, as chronic depression is associated with an increased risk of organic diseases, such as cardiovascular disorders.⁸ Therefore, it is imperative to prioritize the recognition and treatment of psychological disorders such as depression. Through an in-depth analysis of the interactions between nutrients such as omega-3 fatty acids, B vitamins, and sugars and psychological outcomes, this paper stands out for its holistic perspective, which we argue surpasses narrower investigations in scope and applicability. This study was conducted as a narrative review to summarize current evidence on the relationship between dietary habits and mental health across the lifespan. Relevant literature was retrieved from PubMed, Web of Science, and Scopus. The search terms included combinations of “diet,” “across the lifespan,” “diet,” “mental health,” “health promotion,” “depression,” “anxiety,” “infancy,” “childhood,” “adolescence,” “adulthood,” and “old age,” using the Boolean operators AND and OR. Studies published in English between January 2000 and January 2026 were included. Original articles, observational studies, randomized controlled trials, meta-analyses, and review articles related to dietary habits and mental health were considered. Studies unrelated to mental health outcomes, lacking sufficient methodological information,

or published as conference abstracts or editorials were excluded. The risk of bias was appraised using ROBINS-E, and the Newcastle–Ottawa Scale was used to evaluate the quality of studies. This narrative review specifically examines how specific dietary patterns and key nutrients influence mental health outcomes across the human lifespan. Although dietary habits and mental health are bidirectionally related, accumulating evidence suggests that improvements in dietary quality may lead to clinically meaningful reductions in symptoms of depression and anxiety. Unlike many previous reviews that primarily describe associations or external influences on dietary behavior, the present work integrates mechanistic insights and highlights age-specific neurodevelopmental windows of vulnerability to provide more actionable analytical perspectives.⁹

2. The impact of diet on mental health across the lifespan

Diet plays a fundamental role in mental health across the lifespan, with its influence varying according to the physiological, psychological, and social characteristics of different age groups.¹⁰ From infancy to old age, dietary patterns and nutritional status are closely associated with emotional regulation, cognitive development, stress responses, and the risk of mental disorders such as anxiety and depression. Early life nutrition contributes to the establishment of healthy dietary habits and emotional stability, whereas adolescence and adulthood are periods in which academic, occupational, interpersonal, and social pressures may interact with dietary habits to influence psychological well-being. In old age, age-related physiological decline and chronic diseases further emphasize the importance of maintaining high dietary quality for preserving cognitive and emotional health. Increasing evidence suggests that healthy dietary patterns rich in fruits, vegetables, fish, fiber, and essential nutrients may exert protective effects on mental health, while unhealthy dietary habits and nutritional deficiencies may contribute to psychological distress. Therefore, understanding the relationship between dietary habits and mental health across different life stages is essential for developing targeted nutritional and psychological interventions that promote overall well-being (Table 1).

2.1. The impact of diet on mental health during infancy

Infancy can broadly refer to ages 0–5 years. In infancy, diet significantly influences emotional well-being, primarily through food preferences and the expression of emotions. This period is crucial for the establishment of dietary preferences.¹ Infant food preferences are often influenced

Table 1. Comparison of the impact of different dietary factors on mental health across the lifespan

Life course	Dietary factor	Mental health outcome	Evidence strength	Level of evidence	References
Infancy	Mother adopting the New Nordic diet during pregnancy or while breastfeeding	Emotional stability	Moderate to high	Child Cohort Study (MoBa)	11
Childhood	Sufficient intake of omega-3 fatty acids	Reduced symptoms of depression	High	Randomized controlled trial (RCT)	12
Adolescence	Lower adherence to a Mediterranean diet	Attention-deficit/hyperactivity disorder	Moderate	Case-control study	13
Adulthood	A Mediterranean diet supplemented with fish oil	Improved depression	High	RCT	14
Old age	An anti-inflammatory diet	Reduced depression risk and symptoms	Moderate	Meta-analysis	15

by their familial and social environments. It is crucial to correctly understand and guide the establishment of healthy dietary habits in infants. During infancy, parents, who are the closest figures to them, significantly influence infant dietary choices and habits. Parental emotions, particularly those of mothers, play a crucial role. The mothers from low-income backgrounds with higher anxiety scores typically provide diets of lower nutritional value. Consequently, their infants also tend to have lower nutritional quality compared to children of mothers with lower anxiety scores.¹⁶ Research has indicated that poor taxonomic knowledge in the food domain correlates with higher levels of food rejection.¹⁷ At this developmental stage, parents commonly adapt their feeding practices according to their infant's body weight and appetitive traits, exerting pressure on lighter infants to increase food intake and imposing restrictions on those exhibiting greater appetites. When parents maintain a narrowly defined dietary repertoire, infants experience reduced exposure to novel foods and lack positive role modeling, which adversely affects their acceptance of new foods and the establishment of healthier dietary patterns.¹⁸ Parents should therefore enhance the education of infants regarding food knowledge, thereby enriching their conceptual understanding of nutrition. Studies suggest that maternal adherence to a healthier New Nordic diet pattern during pregnancy and breastfeeding, including intake of foods rich in docosahexaenoic acid (DHA) and iron, may support their infant's emotional stability and cognitive development.¹¹ On the contrary, high sugar intake during pregnancy or childhood has been associated with poorer cognitive outcomes in children,¹⁹ and iron-deficiency anemia is associated with emotional disorders in infants.²⁰

2.2. The impact of diet on mental health during childhood

Childhood covers 6–11 years, corresponding to middle childhood or school-age children.²¹ During childhood, the influence of dietary habits on emotions becomes increasingly evident. Parents' impact on their children is particularly pronounced, as children's stressors predominantly originate from their family and parents.²² Parents' dietary patterns also significantly affect their children's psychological well-being. Studies show that when parents ensure adequate omega-3 fatty acid intake in their children, the children tend to have lower scores on depression assessment scales and lower depression severity.¹² Since childhood is a critical period for psychological development, the nutrients contained in the diet directly impact children's emotions and behavior. A balanced diet is crucial at this stage, having a positive influence on emotional stability. In addition, a higher intake of omega-3 fatty acids can promote emotional stability and significantly reduce the occurrence of emotional disorders in children.²³ Therefore, both families and schools must collaborate to provide comprehensive education on diet to ensure the mental and physical well-being of children.

2.3. The impact of diet on mental health during adolescence

Adolescence spans 12–17 years, encompassing early to late adolescence.²⁴ Adolescence is a critical stage of physical and psychological development, marked by rapid physical growth and complex interactions between dietary habits and mental health. During this period, individuals begin to experience significant bodily changes and heightened

emotional sensitivity. Academic pressures increase,²⁵ interpersonal relationships become more complex,²⁶ and many mental health issues first emerge during this stage, necessitating early intervention.²⁵ If the diet lacks essential nutrients such as omega-3 fatty acids and vitamin A, it may result in a decline in cognitive abilities. A nutrient-rich diet enhances levels of brain-derived neurotrophic factor (BDNF), reducing fear memory.²⁷ However, most of the evidence regarding the dietary patterns of adolescence still falls within the scope of case-control studies, and the long-term causal relationship still requires further verification.¹³

Additionally, the prevalence of obesity among adolescents is rising, with a strong correlation between dietary habits and emotional problems. The escape theory posits that overeating serves as an immediate escape from negative emotions, closely tied to heightened depression, anxiety, and stress, particularly in contexts of distress and catastrophic self-referential thinking, where stress exacerbates anxiety symptoms. Concurrently, parental stress significantly influences adolescent dietary quality by altering caregiving behaviors and inducing neurophysiological changes, thereby increasing the risk of stress-induced obesity through the consumption of palatable, obesogenic foods.^{28,29} Additionally, adolescence is characterized by significant peer-related pressures. Thompson *et al.*³⁰ investigated the relationships among appearance-related pressures, internalization of appearance ideals, and emotional eating in adolescent boys and girls. The results revealed that pressures from same-sex peers and muscularity concerns were positively associated with emotional eating in response to feelings of anger, frustration, and distress. Studies have shown that adolescents who manage stress effectively tend to consume more fruits and vegetables, whereas those with inadequate stress management are more prone to emotion-driven eating, characterized by frequent intake of high-calorie, low-nutrient foods.³¹ The Mediterranean diet, which includes fruits, vegetables, fish, legumes, and nuts, has been associated with a reduced risk of depression among adolescents. In contrast, the Western diet, characterized by a high intake of meat, fried foods, and refined and processed products, is linked to a higher risk of depression in adolescents.³² Over time, this creates a vicious cycle. Therefore, during adolescence, it is crucial to ensure a diet rich in essential nutrients. The relationship between dietary habits and emotions requires increased attention, making it urgent to provide adolescents with education on healthy dietary behavior and emotional well-being.

2.4. The impact of diet on mental health during adulthood

Adulthood, spanning approximately 18–64 years and

encompassing emerging adulthood to late adulthood,^{33,34} is a life stage characterized by multiple psychological, social, and physiological challenges. Individuals during this period commonly face academic demands, workplace stress, interpersonal pressures, family responsibilities, and concerns related to body image, all of which may increase vulnerability to anxiety and depression. Research has shown that dietary patterns are closely associated with emotional well-being throughout adulthood. A high-carbohydrate diet may increase cortisol levels in the brain, whereas diets rich in vegetables and fruits are associated with reduced depressive symptoms, lower suicide risk, and improved mental health outcomes.^{35,36} In addition, consuming diets rich in vegetables, fruits, fish, water, and fiber, together with adequate water intake and moderate milk consumption, may improve sleep quality and alleviate symptoms of depression and anxiety.³⁷ Vitamin B6 supplementation has also been associated with improvements in emotional symptoms and a reduced risk of anxiety and depression.²⁵

Dietary habits during adulthood are also strongly influenced by body image concerns and social comparisons. Vegetarian and vegan dietary patterns, which have become increasingly popular during adulthood, are often motivated by weight management and appearance-related concerns. However, studies suggest that strict vegetarian or vegan diets may be associated with higher anxiety levels.³⁸ Dietary habits, particularly common among women, may contribute to negative emotions such as anger, irritability, and anxiety due to hunger.³⁹ Empirical evidence further suggests that appearance-related concerns and peer-related factors exhibit a stronger association with dietary habits in females than in males, whereas body mass index (BMI) demonstrates a more robust correlation with dietary habits in males. Male dieting practices may involve behaviors targeting muscular enhancement. Social interactions with leaner peers may encourage both males and females with low BMI to engage in healthy dietary habits to maintain or reduce BMI, while exposure to overweight peers may heighten weight-related concerns among females and help to develop healthy dietary habits.⁴⁰

For women, adulthood is also a critical period for pregnancy and childbirth, during which substantial physiological and psychological changes occur. Pregnant women with poor dietary quality are more vulnerable to illnesses and psychological distress, while limiting the intake of solid fats, alcohol, and added sugars and increasing the consumption of vegetables, legumes, and fruits are important for maternal and infant health.⁴¹ Furthermore, psychological health interventions for pregnant women are indispensable.⁴² In adults with depression, a Mediterranean-style dietary intervention

supplemented with fish oil during the perinatal period has been associated with improvements in depressive symptoms.¹⁴ Appropriate omega-3 supplementation may therefore benefit both maternal psychological health and infant neurodevelopment.⁴³ Similarly, adequate choline intake during pregnancy has been associated with a reduced risk of anxiety and depression in offspring, making optimized choline intake a potentially effective preventive strategy.⁴⁴

Overall, the relationship between dietary habits and mental health remains highly significant throughout adulthood. Healthy dietary practices may help alleviate emotional distress, improve psychological well-being, and enhance quality of life, whereas unhealthy dietary habits and chronic stress may negatively influence both emotional states and dietary patterns. Therefore, promoting balanced nutrition and psychological health support is essential for maintaining well-being across adulthood.

2.5. The impact of diet on mental health during old age

Old age begins at 65 years, extending through late life.⁴⁵ As individuals enter old age, their physical and psychological states undergo significant changes. The decline in metabolic capacity and the aging of organs necessitate improvements in dietary quality. Elderly men, in particular, face greater challenges in maintaining good nutrition compared to women, which may be attributed to differences in attitudes toward diet and lifestyle between genders. Hence, it is crucial to establish healthy dietary habits, especially for those who lack knowledge or have mobility issues, and to strengthen nutrition management.⁴⁶

Malnutrition and depression have become significant health challenges among the elderly population.⁴⁷ Adopting healthy dietary habits can alleviate depressive symptoms in the elderly and improve their quality of life. Therefore, increasing attention to the dietary habits of the elderly and promoting healthy dietary practices are vital for maintaining their mental health.

Hypertension is also common among the elderly. The risk of cardiovascular disease in hypertensive adults increases with age and the presence of modifiable risk factors, including unhealthy dietary habits, elevated blood lipids and glucose levels, obesity, lack of physical activity, and stress. Integrating the Mediterranean diet and an anti-inflammatory diet can delay neurodegenerative diseases in old age. The dietary pattern emphasizes the consumption of fruit, leafy green vegetables, berries, and olive oil, and has been shown to effectively reduce symptoms of depression in old age.¹⁵ Research indicated that diets rich in antioxidants and B vitamins help lower the risk of depression and cognitive decline in old age.⁴⁸

Establishing and maintaining healthy dietary habits during old age is crucial for mitigating the negative impacts of aging on mental health. Comprehensive nutrition management and educational interventions play a significant role in enhancing the overall well-being of the elderly.

3. Biological mechanisms linking diet and mental health

Accumulating evidence suggests that the relationship between dietary habits and mental health involves complex interactions among the gut–brain axis, neuroinflammation, neurotransmitter synthesis, and neuroplasticity. Dietary patterns can alter gut microbiota composition and microbial metabolites, thereby influencing emotional regulation and cognitive function through neural, immune, endocrine, and metabolic pathways.^{49,50} Western dietary patterns characterized by excessive intake of refined sugar, saturated fat, and ultra-processed foods are associated with gut microbial dysbiosis, increased intestinal permeability, systemic inflammation, and altered short-chain fatty acid production. In contrast, the Mediterranean diet, rich in dietary fiber, polyphenols, and omega-3 fatty acids, promotes microbial diversity and intestinal homeostasis, which highlights the important role of nutrition for the treatment of depression.^{51,52} In addition, microbial metabolites, including indoles and short-chain fatty acids, communicate with the brain through immune signaling, vagal pathways, and aryl hydrocarbon receptor-mediated mechanisms, thereby influencing neuroendocrine and neurotransmitter homeostasis.

Furthermore, dietary nutrients play essential roles in neurotransmitter biosynthesis and neuroplasticity. Tryptophan, an essential amino acid obtained from dietary sources, serves as a precursor for serotonin synthesis, while chronic inflammation and microbial imbalance may shift tryptophan metabolism toward the kynurenine pathway, resulting in reduced serotonin availability and increased neurotoxic metabolite production.⁵³ Omega-3 polyunsaturated fatty acids, particularly DHA and eicosapentaenoic acid, contribute to neuronal membrane fluidity, synaptic plasticity, and anti-inflammatory regulation, whereas B vitamins are involved in one-carbon metabolism and monoamine neurotransmitter synthesis.²³ Deficiencies in these nutrients may impair neurotransmission and increase vulnerability to depressive and anxiety symptoms. Moreover, nutritional factors may influence BDNF, a critical regulator of neurogenesis and synaptic plasticity, with unhealthy dietary patterns and chronic neuroinflammation being associated with reduced BDNF expression and impaired emotional resilience.

4. Discussion

The relationship between dietary habits and mental health across the human lifespan is complex and multifaceted. A pivotal finding is the pervasive influence of omega-3 fatty acids, B vitamins, and sugar on psychological well-being from infancy to old age. For instance, omega-3 deficiency is consistently associated with emotional instability in toddlers,²³ depression in adolescents,²⁷ and cognitive decline in the elderly,⁵⁴ underscoring its protective role in neurodevelopment and mental health.⁷ DHA, a key long-chain omega-3 polyunsaturated fatty acid, plays a critical role in early neurodevelopment. Deficiency of DHA in pregnant women may adversely affect fetal brain development, leading to increased risks of emotional and cognitive instability in infants. Similarly, inadequate omega-3 fatty acid intake (particularly DHA) during infancy and childhood can impair neurodevelopment, reduce appetite, and cause emotional dysregulation, with potential long-term consequences including depression and insomnia in adulthood. In addition, reduced DHA levels in adults have been associated with accelerated aging processes and may increase the long-term risk of

cardiovascular diseases in old age (Figure 1). Similarly, high sugar intake is linked to adverse outcomes, such as emotional disorders in infancy¹⁹ and elevated cortisol levels in young adults,³⁵ suggesting a mechanistic connection to inflammation and stress responses.⁵⁵ Vitamin B deficiencies, particularly B6, are implicated in heightened anxiety and depression across all age groups,²⁵ with folate conferring additional benefits in old age.⁴⁸ These nutrient-specific patterns align with the broader literature on nutritional psychiatry, emphasizing diet as a modifiable determinant of mental health.⁶

The social environment serves as a critical mediator of dietary habits and psychological status, evolving with age-specific stressors. In infancy and childhood, parental influence predominates, shaping food preferences and emotional stability through dietary quality and specific patterns like the New Nordic diet.^{16,22} Adolescence introduces academic and peer pressures, amplifying the impact of an unhealthy diet on depression risk.^{26,32} Across adulthood, appearance-related pressures, lifestyle transitions, work and family responsibilities, and pregnancy-related nutritional demands collectively

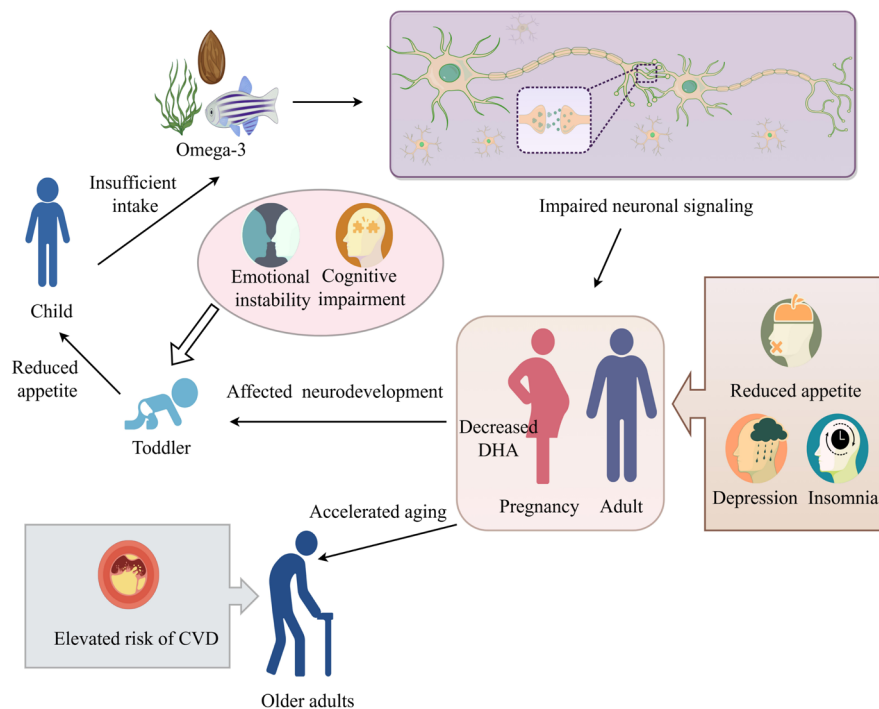


Figure 1. Proposed mechanisms and long-term consequences of omega-3 and DHA deficiency across the lifespan. This figure illustrates proposed mechanisms linking DHA and omega-3 deficiency in the fetal stage and childhood to mental health outcomes across the lifespan. Early DHA and omega-3 deficiency may impair neurodevelopment and *BDNF* expression, potentially increasing vulnerability to emotional dysregulation in infancy and childhood, depression in adolescence and adulthood, and cognitive decline in old age. Evidence strength is moderate, primarily based on cohort studies and mechanistic research. Figure created by the authors using Figdraw.

Abbreviations: BDNF: Brain-derived neurotrophic factor; CVD: Cardiovascular disease; DHA: Docosahexaenoic acid.

complicate the relationship between dietary habits and mental health, while healthy dietary patterns may help alleviate stress and promote emotional well-being.^{37,41} Among older adults, feelings of loneliness and reduced mobility can exacerbate malnutrition, anxiety levels, and negative mood states, whereas dietary patterns such as the Mediterranean–Dietary Approaches to Stop Hypertension (DASH) intervention have a protective effect.^{47,54} This progression highlights a lifespan continuum wherein social context interacts with diet to influence mental health, consistent with ecological models of health behavior.²²

Despite these patterns, contradictions in the findings raise questions about causality and generalizability, highlighting the critical importance of multiple factors in determining mental health. For example, vegetarian and vegan diets in adulthood are associated with elevated anxiety levels.³⁸ Yet the Mediterranean diet, often plant-based, reduces depression risk across multiple age groups. This dietary pattern has recently been recognized as a promising treatment strategy for improving the clinical outcomes of depression.^{32,54,56,57} This discrepancy may reflect confounding factors, such as psychological traits among vegetarians, rather than the diet itself, a nuance unexplored in the cited meta-analysis.³⁸ Gender-related patterns also appear to vary by age and context: older men may face greater challenges in maintaining diet quality than older women,⁴⁶ whereas young adult women may be more vulnerable to dieting-related negative emotions³⁹ and pregnancy-related stress.⁴¹ These variations suggest age- and context-specific gender dynamics that require further investigation, potentially through longitudinal studies disentangling biological and social factors.

A significant limitation is the reliance on correlational data, which hinders causal inference. Claims that balanced diets reduce depression (e.g., in childhood, adulthood) are supported by observational studies, but experimental evidence is scarce.³⁸ This methodological gap risks overattributing mental health outcomes to diet, overlooking confounders such as socioeconomic status or family dynamics.¹⁶ Furthermore, the gut–brain axis, linked to depression,^{55,58} remains underexplored across age groups, despite its potential to elucidate connections between nutrients and mental health through microbiota diversity.⁵⁹ These gaps weaken the mechanistic foundation of the findings and limit their applicability to diverse populations.

In addition, the relationship between dietary habits and mental health appears to be bidirectional rather than unidirectional. For example, dietary changes may affect mental illness by directly influencing mood, while the development of mental illness can lead to changes in dietary

habits.⁶⁰ Increasing evidence suggests that unhealthy dietary patterns may contribute to the development of psychological distress through mechanisms involving systemic inflammation, gut microbiota dysbiosis, oxidative stress, and impaired neurotransmitter regulation.⁶¹ Recent systematic reviews and meta-analyses have reported that high consumption of ultra-processed foods, fast foods, refined carbohydrates, and sugar-sweetened beverages is significantly associated with increased risks of depression and anxiety.^{62,63} For example, a 2024 meta-analysis by Ejtahed *et al.*⁶² demonstrated that greater junk food consumption was positively associated with mental health disorders in adults, particularly depressive symptoms and anxiety. Similarly, recent nutritional psychiatry research has emphasized that poor diet quality may independently predict worse mental health outcomes even after adjustment for lifestyle and socioeconomic confounders.⁶⁴ Conversely, a growing body of evidence also indicates that unhealthy dietary behaviors may arise as a consequence of pre-existing psychological disorders. Individuals experiencing depression, anxiety, or chronic stress frequently exhibit emotional eating, overeating, and increased preference for energy-dense “comfort foods,” especially foods high in sugar and saturated fat.^{65,66} A 2023 scoping review found that impaired emotion regulation and stress responsivity are strongly associated with overeating.⁶⁵ Moreover, stress-induced alterations in reward processing and appetite regulation further perpetuate maladaptive dietary patterns, thereby establishing a vicious cycle between poor mental health and unhealthy diet. Current evidence supports a bidirectional relationship between dietary habits and mental health, with longitudinal studies indicating that poor dietary quality acts as both a consequence and a contributing factor to mental disorders.^{60,67}

Several methodological limitations should be acknowledged when interpreting the findings of this review. First, the majority of cited studies are observational in nature, which precludes establishing causal relationships between dietary habits and mental health outcomes. For instance, lower socioeconomic status is associated with reduced access to nutritious foods and higher levels of chronic stress, independently increasing the risk of depression and anxiety.⁶⁸ Second, most studies relied on self-reported dietary assessments, which are susceptible to recall bias and social desirability effects, potentially leading to misclassification of exposure. Third, reverse causality remains a concern, as pre-existing mental health conditions may alter appetite and dietary preferences, rather than diet being the primary driver of psychological outcomes. Fourth, genetic factors contribute to individual differences in nutrient metabolism, taste preferences, and stress responsivity, yet

few studies adequately controlled for genetic confounding or employed Mendelian randomization approaches to strengthen causal inference. Finally, publication bias may favor positive findings in nutritional psychiatry, while null results remain underreported. Future research should prioritize large-scale prospective cohorts with objective dietary biomarkers, comprehensive adjustment for lifestyle confounders, and integration of genetic and metabolomic data to disentangle the complex relationship between dietary habits and mental health.

5. Conclusion and outlook

This review summarizes the intricate relationship between dietary habits and mental health across the lifespan. This paper reveals that these two factors are deeply intertwined. It demonstrates that, from infancy to old age, diet profoundly influences an individual's health by providing essential nutrients, regulating psychological functions, and stabilizing emotional states.⁶⁹ Specifically, dietary patterns established in infancy lay the foundation for later psychological development. In childhood, balanced nutrition fosters emotional stability and builds psychological resilience. Adolescence, a period of rapid physiological and psychological change, requires particular attention to the bidirectional relationship between diet and mental health to help prevent depression. During adulthood, adherence to healthy dietary habits helps buffer against academic and occupational stressors, supporting emotional equilibrium, stress regulation, and sleep quality amid competing demands. Finally, in old age, the Mediterranean–DASH intervention plays a key role in reducing the risk of cognitive decline and depression, thereby enhancing overall quality of life.^{70–72} However, the strength of the current evidence varies across different dietary factors. Evidence supporting an overall healthy dietary pattern appears relatively consistent, whereas evidence regarding specific nutrients and dietary components remains limited or inconsistent. Moreover, most of the existing studies are observational, which limits the interpretation of causal relationships. More longitudinal studies and intervention studies are needed to clarify how these relationships change at different life stages. Health psychology theories further suggest that self-regulation, stress coping strategies, and perceived social support play critical roles in shaping dietary habits and their subsequent effects on emotional and psychological well-being.⁷³ To further substantiate these associations, future research should conduct longitudinal studies to trace the cumulative impact of early dietary patterns on later mental health outcomes. Randomized controlled trials are warranted to examine how social support and life stress, as moderating variables, differentially influence the effects of healthy dietary habits on anxiety and depression during high-stress phases such

as adolescence and adulthood. Additionally, integrating dietary, inflammatory, and socio-environmental data via machine learning can facilitate the development of risk-stratified, personalized interventions to predict mental health outcomes in vulnerable groups, such as adolescent fast-food consumers or socially isolated older adults. Furthermore, cross-cultural studies comparing the stage-specific effects of distinct dietary patterns on mental health are essential to elucidate the role of environmental factors.⁷⁴ These approaches would help test the proposed framework of the interaction between dietary habits and mental health and support the development of stage-specific dietary interventions. Continuous nutritional support and education may contribute to improved mental health and overall well-being at the population level.

Acknowledgments

None.

Funding

This work was financially supported by Zhejiang Shuren University Basic Scientific Research Special Funds (2024XZ011) and Zhejiang Health Information Association Research Program (Grant No. 2025XHZN-Z04). These funders had no role in the study design, literature interpretation, manuscript preparation, or decision to submit the article for publication.

Conflict of interest

The authors declare they have no conflicts of interest to report.

Author contributions

Conceptualization: Xiaoping Li, Jianguo Zhang

Supervision: Xinling Zhang

Visualization: Jianguo Zhang

Writing—original draft: Xiaoping Li, Yue Xu

Writing—review & editing: Xiaoping Li, Hailing Ji, Yuting Qiu, Shiyu Chen, Lailing Du, Jianguo Zhang, Xinling Zhang

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data

No new data were generated or analyzed in this study. All sources discussed in this narrative review are available in the cited literature.

Further disclosure

During the preparation of this manuscript, the authors used ChatGPT-5.5 (OpenAI, USA) solely for language editing, grammar correction, and improving readability. The AI tool was used under the direct supervision of the authors, and all generated content was carefully reviewed and verified by the authors for accuracy and originality. The AI tool was not involved in the interpretation of results or the formulation of scientific conclusions.

References

1. Maier-Nöth A. Early Development of Food Preferences and Healthy Eating Habits in Infants and Young Children. *Nestle Nutr Inst Workshop Ser.* 2019;91:11-20.
doi: 10.1159/000493674
2. Berridge KC. 'Liking' and 'wanting' food rewards: brain substrates and roles in eating disorders. *Physiol Behav.* 2009;97(5):537-550.
doi: 10.1016/j.physbeh.2009.02.044
3. Talib M, Rachdi M, Papazova A, Nicolis H. The Role of Dietary Patterns and Nutritional Supplements in the Management of Mental Disorders in Children and Adolescents: An Umbrella Review of Meta-Analyses: Le rôle des habitudes alimentaires et des suppléments nutritionnels dans la prise en charge des troubles mentaux chez les enfants et les adolescents : une méta-revue de méta-analyses. *Can J Psychiatry.* 2024;69(8):567-589.
doi: 10.1177/07067437241248070
4. Donofry SD, van Zoest W, Moonen A, Sacchetti S, Nederkoorn C, Roefs A. Effect of dietary restraint and mood state on attentional processing of food cues. *J Behav Ther Exp Psychiatry.* 2019;62:117-124.
doi: 10.1016/j.jbtep.2018.10.002
5. Conner M, Norman P. Health behaviour: Current issues and challenges. *Psychol Health.* 2017;32(8):895-906.
doi: 10.1080/08870446.2017.1336240
6. Shabbir MA, Mehak F, Khan ZM, *et al.* Delving the role of nutritional psychiatry to mitigate the COVID-19 pandemic induced stress, anxiety and depression. *Trends Food Sci Technol.* 2022;120:25-35.
doi: 10.1016/j.tifs.2021.12.035
7. Bell KA, Cherkerzian S, Drouin K, *et al.* Associations of Macronutrient Intake Determined by Point-of-Care Human Milk Analysis with Brain Development among very Preterm Infants. *Children (Basel).* 2022;9(7).
doi: 10.3390/children9070969
8. Scott KM. Depression, anxiety and incident cardiometabolic diseases. *Curr Opin Psychiatry.* 2014;27(4):289-293.
doi: 10.1097/ycp.0000000000000067
9. Firth J, Marx W, Dash S, *et al.* The Effects of Dietary Improvement on Symptoms of Depression and Anxiety: A Meta-Analysis of Randomized Controlled Trials. *Psychosom Med.* 2019;81(3):265-280.
doi: 10.1097/psy.0000000000000673
10. Mikkelsen B, Williams J, Rakovac I, *et al.* Life course approach to prevention and control of non-communicable diseases. *BMJ.* 2019;364:l257.
doi: 10.1136/bmj.l257
11. Vejrurp K, Hillesund ER, Agnihotri N, Helle C, Øverby NC. Diet in Early Life Is Related to Child Mental Health and Personality at 8 Years: Findings from the Norwegian Mother, Father and Child Cohort Study (MoBa). *Nutrients.* 2023;15(1):243.
doi: 10.3390/nu15010243
12. Fristad MA, Roley-Roberts ME, Black SR, Arnold LE. Moody kids years later: Long-term outcomes of youth from the Omega-3 and therapy (OATS) studies. *J Affect Disord.* 2021;281:24-32.
doi: 10.1016/j.jad.2020.11.115
13. Ríos-Hernández A, Alda JA, Farran-Codina A, Ferreira-García E, Izquierdo-Pulido M. The Mediterranean Diet and ADHD in Children and Adolescents. *Pediatrics.* 2017;139(2):e20162027.
doi: 10.1542/peds.2016-2027
14. Parletta N, Zarnowiecki D, Cho J, *et al.* A Mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression: A randomized controlled trial (HELFIMED). *Nutr Neurosci.* 2019;22(7):474-487.
doi: 10.1080/1028415x.2017.1411320
15. Tolkien K, Bradburn S, Murgatroyd C. An anti-inflammatory diet as a potential intervention for depressive disorders: A systematic review and meta-analysis. *Clin Nutr.* 2019;38(5):2045-2052.
doi: 10.1016/j.clnu.2018.11.007
16. Trude ACB, Black MM, Surkan PJ, Hurley KM, Wang Y. Maternal anxiety and diet quality among mothers and toddlers from low-income households. *Matern Child Nutr.* 2020;16(4):e12992.
doi: 10.1111/mcn.12992
17. Pickard A, Thibaut JP, Philippe K, Lafraire J. Poor conceptual knowledge in the food domain and food rejection dispositions in 3- to 7-year-old children. *J Exp Child Psychol.* 2023;226:105546.
doi: 10.1016/j.jecp.2022.105546
18. Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F,

- Brambilla P, Agostoni C. Factors Influencing Children's Eating Behaviours. *Nutrients*. 2018;10(6).
doi: 10.3390/nu10060706
19. Cohen JFW, Rifas-Shiman SL, Young J, Oken E. Associations of Prenatal and Child Sugar Intake With Child Cognition. *Am J Prev Med*. 2018;54(6):727-735.
doi: 10.1016/j.amepre.2018.02.020
20. Chang S, Wang L, Wang Y, *et al*. Iron-deficiency anemia in infancy and social emotional development in preschool-aged Chinese children. *Pediatrics*. 2011;127(4):e927-e933.
doi: 10.1542/peds.2010-1659
21. Øverby NC, Lüdemann E, Høigaard R. Self-reported learning difficulties and dietary intake in Norwegian adolescents. *Scand J Public Health*. 2013;41(7):754-760.
doi: 10.1177/1403494813487449
22. Gill M, Koleilat M, Whaley SE. The Impact of Food Insecurity on the Home Emotional Environment Among Low-Income Mothers of Young Children. *Matern Child Health J*. 2018;22(8):1146-1153.
doi: 10.1007/s10995-018-2499-9
23. Innis SM. Dietary omega 3 fatty acids and the developing brain. *Brain Res*. 2008;1237:35-43.
doi: 10.1016/j.brainres.2008.08.078
24. Sahril N, Adnan MAA, Khalil MKN, *et al*. Association of dietary behaviour and depression among adolescents in Malaysia: a cross-sectional study. *J Health Popul Nutr*. 2023;42(1):133.
doi: 10.1186/s41043-023-00480-5
25. Galler JR, Bryce CP, Zichlin ML, Fitzmaurice G, Eaglesfield GD, Waber DP. Infant malnutrition is associated with persisting attention deficits in middle adulthood. *J Nutr*. 2012;142(4):788-794.
doi: 10.3945/jn.111.145441
26. Zheng M, Guo X, Chen Z, Deng J, Hu M. Association between interpersonal relations and anxiety, depression symptoms, and suicidal ideation among middle school students. *Front Public Health*. 2023;11:1053341.
doi: 10.3389/fpubh.2023.1053341
27. Provensi G, Schmidt SD, Boehme M, *et al*. Preventing adolescent stress-induced cognitive and microbiome changes by diet. *Proc Natl Acad Sci USA*. 2019;116(19):9644-9651.
doi: 10.1073/pnas.1820832116
28. Dimitratos SM, Swartz JR, Laugero KD. Pathways of parental influence on adolescent diet and obesity: a psychological stress-focused perspective. *Nutr Rev*. 2022;80(7):1800-1810.
doi: 10.1093/nutrit/nuac004
29. Lim MC, Parsons S, Goglio A, Fox E. Anxiety, stress, and binge eating tendencies in adolescence: a prospective approach. *J Eat Disord*. 2021;9(1):94.
doi: 10.1186/s40337-021-00444-2
30. Thompson KA, Kelly NR, Schvey NA, *et al*. Internalization of appearance ideals mediates the relationship between appearance-related pressures from peers and emotional eating among adolescent boys and girls. *Eat Behav*. 2017;24:66-73.
doi: 10.1016/j.eatbeh.2016.12.008
31. Tate EB, Spruijt-Metz D, Pickering TA, Pentz MA. Two facets of stress and indirect effects on child diet through emotion-driven eating. *Eat Behav*. 2015;18:84-90.
doi: 10.1016/j.eatbeh.2015.04.006
32. Chopra C, Mandalika S, Kinger N. Does diet play a role in the prevention and management of depression among adolescents? A narrative review. *Nutr Health*. 2021;27(2):243-263.
doi: 10.1177/0260106020980532
33. Cena H, Porri D, De Giuseppe R, *et al*. How Healthy Are Health-Related Behaviors in University Students: The HOLISTic Study. *Nutrients*. 2021;13(2).
doi: 10.3390/nu13020675
34. Głabska D, Guzek D, Groele B, Gutkowska K. Fruit and Vegetable Intake and Mental Health in Adults: A Systematic Review. *Nutrients*. 2020;12(1):115.
doi: 10.3390/nu12010115
35. Stachowicz M, Lebieżńska AJEFR, Technology. The effect of diet components on the level of cortisol. *Eur Food Res Technol*. 2016;242:2001-2009.
36. Hwang IC, Choi S. Association between consumption of fruits and vegetables with suicidal ideation. *Public Health Nutr*. 2022;25(5):1-6.
doi: 10.1017/s1368980021004687
37. Hepsomali P, Groeger JA. Diet, Sleep, and Mental Health: Insights from the UK Biobank Study. *Nutrients*. 2021;13(8):2573.
doi: 10.3390/nu13082573
38. Iguacel I, Huybrechts I, Moreno LA, Michels N. Vegetarianism and veganism compared with mental health and cognitive outcomes: a systematic review and meta-analysis. *Nutr Rev*. 2021;79(4):361-381.
doi: 10.1093/nutrit/nuaa030
39. Ackermans MA, Jonker NC, Bennis EC, de Jong PJ. Hunger increases negative and decreases positive emotions in women with a healthy weight. *Appetite*. 2022;168:105746.
doi: 10.1016/j.appet.2021.105746

40. Miething A, Rostila M, Edling C, Rydgren J. The Peer Context of Dieting: The Relationship between Young Adults' Dieting Frequency and Their Friends' Weight-Related Characteristics. *Int J Environ Res Public Health*. 2018;15(12). doi: 10.3390/ijerph15122744
41. Avalos LA, Caan B, Nance N, *et al*. Prenatal Depression and Diet Quality During Pregnancy. *J Acad Nutr Diet*. 2020;120(6):972-984. doi: 10.1016/j.jand.2019.12.011
42. Boutté AK, Turner-McGrievy GM, Wilcox S, Liu J, Eberth JM, Kaczynski AT. Associations of maternal stress and/or depressive symptoms with diet quality during pregnancy: a narrative review. *Nutr Rev*. 2021;79(5):495-517. doi: 10.1093/nutrit/nuaa019
43. Parker G, Gibson NA, Brotchie H, Heruc G, Rees AM, Hadzi-Pavlovic D. Omega-3 fatty acids and mood disorders. *Am J Psychiatry*. 2006;163(6):969-978. doi: 10.1176/ajp.2006.163.6.969
44. Bekdash RA. Epigenetics, Nutrition, and the Brain: Improving Mental Health through Diet. *Int J Mol Sci*. 2024;25(7). doi: 10.3390/ijms25074036
45. Féart C, Samieri C, Barberger-Gateau P. Mediterranean diet and cognitive function in older adults. *Curr Opin Clin Nutr Metab Care*. 2010;13(1):14-18. doi: 10.1097/MCO.0b013e3283331fe4
46. Zhao H, Andreyeva T. Diet Quality and Health in Older Americans. *Nutrients*. 2022;14(6). doi: 10.3390/nu14061198
47. Katsas K, Mamalaki E, Kontogianni MD, *et al*. Malnutrition in older adults: Correlations with social, diet-related, and neuropsychological factors. *Nutrition*. 2020;71:110640. doi: 10.1016/j.nut.2019.110640
48. Singh R, Kanwar SS, Sood PK, Nehru B. Beneficial effects of folic acid on enhancement of memory and antioxidant status in aged rat brain. *Cell Mol Neurobiol*. 2011;31(1):83-91. doi: 10.1007/s10571-010-9557-1
49. Liu L, Wang H, Chen X, Zhang Y, Zhang H, Xie P. Gut microbiota and its metabolites in depression: from pathogenesis to treatment. *EBioMedicine*. 2023;90:104527. doi: 10.1016/j.ebiom.2023.104527
50. Schellekens H, Ribeiro G, Cuesta-Martí C, Cryan JF. The microbiome-gut-brain axis in nutritional neuroscience. *Nutr Neurosci*. 2023;26(11):1159-1171. doi: 10.1080/1028415x.2022.2128007
51. Barber TM, Kabisch S, Pfeiffer AFH, Weickert MO. The Effects of the Mediterranean Diet on Health and Gut Microbiota. *Nutrients*. 2023;15(9). doi: 10.3390/nu15092150
52. Bayes J, Schloss J, Sibbritt D. The effect of a Mediterranean diet on the symptoms of depression in young males (the "AMMEND: A Mediterranean Diet in MEN with Depression" study): a randomized controlled trial. *Am J Clin Nutr*. 2022;116(2):572-580. doi: 10.1093/ajcn/nqac106
53. Miyamoto K, Sujino T, Kanai T. The tryptophan metabolic pathway of the microbiome and host cells in health and disease. *Int Immunol*. 2024;36(12):601-616. doi: 10.1093/intimm/dxae035
54. Yau KY, Law PS, Wong CN. Cardiac and Mental Benefits of Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) Diet plus Forest Bathing (FB) versus MIND Diet among Older Chinese Adults: A Randomized Controlled Pilot Study. *Int J Environ Res Public Health*. 2022;19(22). doi: 10.3390/ijerph192214665
55. Ganci M, Suleyman E, Butt H, Ball M. The role of the brain-gut-microbiota axis in psychology: The importance of considering gut microbiota in the development, perpetuation, and treatment of psychological disorders. *Brain Behav*. 2019;9(11):e01408. doi: 10.1002/brb3.1408
56. Kiani AK, Medori MC, Bonetti G, *et al*. Modern vision of the Mediterranean diet. *J Prev Med Hyg*. 2022;63(2 Suppl 3):E36-E43. doi: 10.15167/2421-4248/jpmh2022.63.2S3.2745
57. Zielińska M, Łuszczki E, Michońska I, Dereń K. The Mediterranean Diet and the Western Diet in Adolescent Depression-Current Reports. *Nutrients*. 2022;14(20). doi: 10.3390/nu14204390
58. Averina OV, Poluektova EU, Zorkina YA, Kovtun AS, Danilenko VN. Human Gut Microbiota for Diagnosis and Treatment of Depression. *Int J Mol Sci*. 2024;25(11). doi: 10.3390/ijms25115782
59. Dong J, Zhang J, Cheng S, *et al*. A high-fat diet induced depression-like phenotype via hypocretin-HCRTR1 mediated inflammation activation. *Food Funct*. 2024;15(17):8661-8673. doi: 10.1039/d4fo00210e
60. Bremner JD, Moazzami K, Wittbrodt MT, *et al*. Diet, Stress and Mental Health. *Nutrients*. 2020;12(8):2428. doi: 10.3390/nu12082428
61. Dimov S, Mundy LK, Bayer JK, Jacka FN, Canterford L, Patton GC. Diet quality and mental health problems in late

- childhood. *Nutr Neurosci.* 2021;24(1):62-70.
doi: 10.1080/1028415x.2019.1592288
62. Ejtahed HS, Mardi P, Hejrani B, *et al.* Association between junk food consumption and mental health problems in adults: a systematic review and meta-analysis. *BMC Psychiatry.* 2024;24(1):438.
doi: 10.1186/s12888-024-05889-8
63. Johnstad PG. Unhealthy behaviors associated with mental health disorders: a systematic comparative review of diet quality, sedentary behavior, and cannabis and tobacco use. *Front Public Health.* 2023;11:1268339.
doi: 10.3389/fpubh.2023.1268339
64. Suárez-López LM, Bru-Luna LM, Martí-Vilar M. Influence of Nutrition on Mental Health: Scoping Review. *Healthcare (Basel).* 2023;11(15).
doi: 10.3390/healthcare11152183
65. Arexis M, Feron G, Brindisi MC, Billot P, Chambaron S. A scoping review of emotion regulation and inhibition in emotional eating and binge-eating disorder: what about a continuum? *J Eat Disord.* 2023;11(1):197.
doi: 10.1186/s40337-023-00916-7
66. Tan EJ, Raut T, Le LK, *et al.* The association between eating disorders and mental health: an umbrella review. *J Eat Disord.* 2023;11(1):51.
doi: 10.1186/s40337-022-00725-4
67. Dabravolskaj J, Patte KA, Yamamoto S, Leatherdale ST, Veugelers PJ, Maximova K. Association Between Diet and Mental Health Outcomes in a Sample of 13,887 Adolescents in Canada. *Prev Chronic Dis.* 2024;21:E82.
doi: 10.5888/pcd21.240187
68. Freeman A, Tyrovolas S, Koyanagi A, *et al.* The role of socio-economic status in depression: results from the COURAGE (aging survey in Europe). *BMC Public Health.* 2016;16(1):1098.
doi: 10.1186/s12889-016-3638-0
69. Merlo G, Bachtel G, Sugden SG. Gut microbiota, nutrition, and mental health. *Front Nutr.* 2024;11:1337889.
doi: 10.3389/fnut.2024.1337889
70. Oenema A, de Ruijter D, Vingerhoets C, *et al.* Nutrition and mental disorders during the life span: an overview of scientific evidence. *Tijdschr Psychiatr.* 2020;62(11):927-935. [In Dutch].
71. Wu J, Barbey AK. Nutrition and Mental Health: Advances in Nutritional Cognitive Neuroscience. *Annu Rev Food Sci Technol.* 2026;17(1):1-24.
doi: 10.1146/annurev-food-052824-043906
72. McNamara C, Hay P, Katsikitis M, Chur-Hansen A. Emotional responses to food, body dissatisfaction and other eating disorder features in children, adolescents and young adults. *Appetite.* 2008;50(1):102-109.
doi: 10.1016/j.appet.2007.06.004
73. Sirois FM, Kitner R, Hirsch JK. Self-compassion, affect, and health-promoting behaviors. *Health Psychol.* 2015;34(6):661-669.
doi: 10.1037/hea0000158
74. Eissenstat SJ, Gao N, Radler D, Oh TL. Nutrient Intake Differences Among Ethnic Groups and Risks of Depression. *J Immigr Minor Health.* 2020;22(6):1141-1148.
doi: 10.1007/s10903-020-01023-4