Annals of Medicine and Medical Sciences (AMMS)
Volume 04, 2025, *Page No.: 647 to 650*
Available at: *http://ammspub.com*

Review Article

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Behavioral Activation via the Gut-Brain Axis: The Role of Structured Meal Preparation in Holistic Psychiatric Care

Dilinuer Wubuli, MD [1], Parinda Parikh, MD *[2], Mohamad Alsakka, MD [3], Boburbek Abdugabborov, MD [4], Shaurya Kumar Singh, MD [5], Himani J Suthar, MD [6], Sahia Manepalli [7], Eric Wang [8], Mina Oza, MD [9]

[1]Department of Neurology, Toronto Western Hospital, Toronto, Canada.
[2]Department of Psychiatry, Weill Cornell Medical School, White Plains, USA.
[3]Department of Psychiatry, University of Illinois at Chicago, Chicago, Illinois, USA.
[4]Department of Psychiatry, Center for the Development of Professional Qualification of Medical Workers, Tashkent, Uzbekistan.
[5]Pravara Institute of Medical Sciences, Loni, Maharashtra, India.
[6]GMERS Medical College and Civil Hospital, Gandhinagar, India.
[7]University of South Florida, Tampa, USA.
[8]Edgemont Jr. Sr. High School, Westchester, New York, USA.
[9]Second Arc Psychiatric Associates, White Plains, New York, USA.

*Corresponding author: Parinda Parikh, M.D.; *drparikh@2ndarc.com*

Abstract

Background: Emerging evidence suggests that the gut microbiome plays a critical role in the pathophysiology of psychiatric disorders, particularly depression and anxiety. At the same time, behavioral activation (BA), a structured psychotherapeutic strategy that increases engagement in goal-directed activities, remains an effective non-pharmacologic treatment for mood disorders. ***Objective:*** This narrative review explores how structured meal preparation and dietary planning can serve as a unique intersection between behavioral activation and gut-brain axis modulation, offering a promising adjunctive strategy for personalized, holistic psychiatric care. ***Discussion:*** We examine existing literature on gut microbiome and mental health, review the role of dietary patterns in psychiatric recovery, and propose structured eating as a culturally adaptable, low-cost behavioral activation tool. This approach may be especially valuable in underserved populations, where access to traditional therapies is limited, and food holds both cultural and psychological significance. ***Conclusion:*** Structured dietary interventions, when intentionally framed within behavioral therapy models, may represent a novel, gut-centered form of behavioural activation with strong potential for integration into modern psychiatric treatment practice.

Keywords: ***Gut microbiome, Lifestyle psychiatry, Dietary interventions.***

Introduction

According to the 2024 National Health Interview Survey, approximately 18.2% of U.S. adults aged 18 and over reported experiencing symptoms of anxiety, while 21.4% reported symptoms of depression [3]. Despite the widespread use of antidepressants and anxiolytics, current pharmacologic treatments often yield only partial responses and are associated with side effects and high relapse rates, underscoring the need for more comprehensive and holistic approaches to care [1,15,17]. In response to these limitations, there has been a growing interest in lifestyle psychiatry, which integrates evidence-based behavioral strategies, such as nutrition, exercise, and sleep hygiene into mental health care [16]. One such approach includes dietary interventions, where structured dietary improvement led to significant reductions in depressive symptoms in adults with major depressive disorder [2]. These findings support the emerging role of the gut–brain axis, a bidirectional communication pathway between the gastrointestinal system and central nervous system, in emotional regulation. When paired with behavioural activation, a psychotherapeutic technique that encourages engagement in meaningful, goal-directed activities, lifestyle interventions may offer a synergistic model for treating mood disorders.

The Gut–Brain Axis in Psychiatry

Received: June 10, 2025; **Revised:** June 28, 2025; **Accepted:** July 10, 2025

Including the vagus nerve, immunological signalling, metabolic pathways, and gut microbiota, the gut-brain axis is a bidirectional communication system between the gastrointestinal tract and the central nervous system. The microbiome plays a key role in modulating brain development and behaviour through microbial metabolites, immune activation, and direct neural signaling via the vagus nerve [10]. Evidence links gut dysbiosis to depression and anxiety, with alterations in microbial composition influencing levels of systemic inflammation, cortisol, and neurotransmitter precursors [5,18]. Studies show that microbial imbalances can affect emotional regulation and stress reactivity, highlighting the microbiota's role in psychiatric vulnerability (Cryan *et al*., 2019) [4]. Clinically, dietary patterns such as the Mediterranean diet, rich in fiber, polyphenols, and omega-3 fatty acids, support a diverse microbiome and are associated with reduced depression risk [8,20]. Similarly, fermented foods enhance microbial diversity and have been linked to improved mood and reduced social anxiety [4,19].

Behavioral Activation in Psychiatric Care

Behavioral Activation (BA) is a structured, evidence-based intervention that targets the cycle of depression by increasing engagement in meaningful and reinforcing activities. It operates on the principle that reduced positive reinforcement and increased avoidance behaviors maintain depressive symptoms; thus, BA aims to reverse this by helping individuals schedule activities that promote a sense of accomplishment and pleasure [6]. Central to BA is the activation of reward systems through deliberate exposure to valued routines, which counters the passivity and isolation typical of depression. Meta-analytic evidence supports its efficacy: Mazzucchelli *et al*. found BA to be highly effective, with effect sizes comparable to those of cognitive therapy [6]. Dobson *et al*. reported that both BA and cognitive therapy (CT)offer enduring protection against relapse and recurrence in major depression [7]. Furthermore, the study showed BA and CT not only outperformed placebo but were at least as effective as ongoing antidepressant medication over a two-year follow-up [7]. Establishing consistent routines and structured daily activities not only improves functioning but also stabilizes mood by providing predictability and reinforcing personal agency, important considerations that contribute to recovery and sustained mental health [11-13].

Structured Meal Preparation as Behavioral Activation

Study showed that home meal preparation leads to nutrient-rich diets and also brings psychological benefits, including greater control over choices, improved self-efficacy, and enhanced emotional well-being [21]. Furthermore, improvements in diet quality have been associated with reductions in depressive and anxiety symptoms, as dietary patterns influence inflammation, neurotransmitter synthesis, and gut microbiota, important factors of mood regulation [8]. Even among younger populations, establishing healthy eating routines has shown associations with better emotional health outcomes, reinforcing the potential value of structured meal activities in mood improvement [9]. We propose that structured meal preparation may serve as an form of behavioral activation by providing individuals with a goal-directed, routine activity that offers immediate reinforcement. Engaging in meal prep not only helps establish a predictable structure, but also fosters a sense of control over food choices. In the long term, this process may contribute to a stronger sense of self-control and well-being.

Bridging the Concepts: Holistic Integration

To reduce mental health disparities in underserved populations, we propose a holistic model that integrates Behavioral Activation (BA) with gut microbiome-focused interventions. Currently, there's a need for integrative healthcare that is accessible and affordable, particularly in underserved settings. Building on this, combining behavioral activation, a low-cost, evidence-based approach that activates engagement in meaningful activities, with dietary and probiotic strategies to modulate the gut-brain axis could offer a biopsychosocial intervention adaptable to diverse cultural contexts. Physicians, therapists, and community health workers could implement this model through collaborative care frameworks that incorporate nutritional guidance and culturally attuned behavioral strategies, offering an accessible, affordable path to recovery for underserved populations.

Future Directions and Research Needs

Emerging evidence suggests that gut microbiota play a crucial role in modulating mood and behavior, yet there is a pressing need for culturally-tailored, microbiome-informed mental health interventions. Also we need pilot studies that evaluate psychosocial and microbial co-targeting strategies in diverse populations. Clarke *et al*. (2020) supported the therapeutic potential of psychobiotics, but highlighted lacking of population-specific clinical trials that test efficacy across diverse psychiatric or demographic subgroups [14]. Future research should focus on designing community-based pilot studies that explore how dietary, probiotic, and behavioral interventions impact mental health outcomes in underserved communities, considering cultural and religious beliefs, dietary habits, and stress exposures unique to these groups. Such studies will not only advance the science of the gut-brain axis but also ensure its clinical relevance and accessibility across cultural boundaries.

Conclusion

This review highlights the promising intersection between dietary interventions and behavioral activation in the treatment of mood disorders, specifically within the context of the gut-brain axis. By integrating structured meal preparation into behavioral activation, individuals can engage in a culturally meaningful, low-cost, and self-centred activity that promotes routine, personal satisfaction, and psychological well-being. These interventions offer an accessible approach for diverse populations, including underserved communities, where traditional psychiatric care may be less accessible.

The benefits of this integrated model are clear: it capitalizes on the growing evidence of the microbiome's role in mood regulation, promotes healthy eating habits that contribute to overall mental health, and provides individuals with a sense of control over their daily routines and diet. Moreover, these strategies are adaptable to cultural contexts, making them relevant across diverse populations. Importantly, they offer a scalable solution that could be implemented without significant financial burden, thus addressing critical mental health disparities.

Psychiatry, as a field, can evolve significantly by embracing such integrative approaches, fostering a more holistic, biopsychosocial model of care. By further incorporating lifestyle factors like dietary interventions, alongside pharmacotherapy and psychotherapeutic techniques like behaviour activation, patients may benefit more in the long term. Future research should continue to explore the full potential of these interventions, particularly in

real-world settings, to ensure they meet the needs of diverse communities and contribute to a more inclusive and accessible mental health care system.

Declarations

Acknowledgements

The authors would like to thank colleagues and mentors who provided guidance and feedback during the preparation of this review.

Conflict of interest

The authors declare no conflicts of interest.

Funding/ financial support

No funding was received for this work.

Authors Contributions

All authors made substantial contributions to the reported work. They gave final approval for the version to be published and agreed on the journal for submission.

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