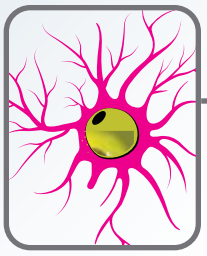

The biopsychosocial and lifestyle model for case formulation

By Yoon Suh Moh

Previously in this three-part series on an intricate combination of determinants that affect mental health, we have explored lifestyle factors such as diet. We particularly focused on the bidirectional gut-brain connection and microorganisms related to human development and health across the life span. We also explored the modulating role of diet on these neurobiological pathways.

In this article, we will cover the biopsychosocial and lifestyle (BPSL) model of mood disorders for case formulation. This model helps us expand the scope of our case conceptualization by incorporating lifestyle factors such as physical activity, diet, sleep, stress management and mindfulness-based exercises into case formulation that promotes well-being and wellness in individuals, families and communities.

The BPSL model of mood disorders

Gin S. Malhi and colleagues reported in 2015 in the *Australian & New Zealand Journal of Psychiatry* that the BPSL model provides a useful framework for understanding an intricate mixture of determinants that contribute to the onset and persistence of mood disorders and their symptoms.

The model encompasses four domains: biological, psychological, social and lifestyle factors. Lifestyle factors (e.g., physical activity, diet, smoking, sleep) have been recently added to the model because emerging research suggests that they play a significant role in the development and persistence of mood disorders. The BPSL model is helpful for health care professionals such as counselors in planning clinical management and potential relapse prevention should it be necessary.

The aforementioned authors also noted that case formulation goes beyond diagnostic assessment and diagnosis-based treatment. It also involves how the client's strengths (such as resilience) play a critical role in the process of recovery and promote management of the problem over the long term. Case formulation also draws connections between past experiences and how these relate to the current clinical presentation. The importance of making these connections cannot be emphasized enough, as we explored in previous articles. Early life experiences affect brain and gut development, their intricate communication with each other, and numerous commensal microorganisms and their dialogue with host cells across the life span.

According to Malhi and colleagues, the BPSL model can be used prior to case formulation as a guiding tool for counselors to explore and understand the client's presenting problems. Factors that precipitate or maintain psychiatric symptoms and lead to their expression usually fall into one of the four domains in the model.

The steps traditionally involved in case formulation include examining the *presenting problem* alongside *predisposing*, *precipitating*, *perpetuating* and *protective* factors. Using these steps to conduct case formulation can lead to considering which interventions and strategies are most likely to benefit the client. However, as Malhi and colleagues note, these steps are only a guide, and they may not be relevant or applicable to every client.

More information about the BPSL model is provided in the Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines at *tinyurl.com/RANZCPMoodDisorders*.

Case formulation

In this section, we provide a case vignette to describe "Abbey." (Note: We are using the pronouns they/them/their for Abbey and Abbey's mother.) Abbey is a 21-year-old cisgender Asian American. Abbey comes to see you for individual counseling through self-referral. Abbey is a junior studying biology at a prestigious university in the greater Philadelphia area. However, they are currently staying at home in Washington, D.C., because their mother's cognitive deficits (including memory decline) and frequent mood swings recently have become more pronounced.

Abbey reports ongoing gastrointestinal (GI) complaints, including frequent bouts of alternating constipation and diarrhea, and sporadic abdominal discomfort for the past month or so. Abbey also notes that they used to suffer from urinary infections growing up. They also voice increased stress associated with the demands of caregiving as they are getting more involved in long-term care for their mother. Even though Abbey deeply loves their mother, they feel "trapped" in the caregiver role and note less emotional support from their sibling living abroad.

As Abbey's stress level increases, they begin to experience frequent agitation, followed by deep sorrow that feels endless at times, excessive fatigue, loss of interest in activities that they used to

enjoy and difficulty maintaining good oral hygiene. Abbey denies a history of mental disorders in their family but discloses that their deceased father struggled with uncontrolled alcohol use.

Abbey usually either skips breakfast or rushes to the local deli for a bacon, egg and cheese bagel because their morning hours are consumed with helping their mother get out of bed and take medications or taking their mother to doctors' appointments. Although Abbey used to eat a variety of vegetables and fruits daily prior to taking on the current role of primary caregiver, their recent lunches and dinners have typically consisted of burgers and fries or pizzas from a local diner. Abbey also discloses that they rarely take time to prepare meals with fresh produce and whole grains. In addition, of late, Abbey has not been drinking much water throughout the day, opting for sweetened sodas instead. Abbey denies drinking alcohol, smoking or using other substances in their lifetime.

Guided by the BPSL model, you can begin to formulate a case with Abbey based on the information provided.

Presenting problem

Abbey's presenting problem seems to be associated with chronic stress caused by the demands of caregiving they are shouldering with limited support and resources. It may also involve the negative consequences of chronic stress, such as frequent agitation followed by deep, persistent sorrow, excessive fatigue, loss of interest in activities and difficulty maintaining good oral hygiene.

Predisposing factors

Early life experiences: Although there is no available information yet regarding biological factors that may have predisposed Abbey to vulnerability for high stress reactivity or responsiveness, these are worth further assessment. Jack P. Shonkoff and colleagues reported in 2012 in the journal *Pediatrics* that early experiences and environmental influences can have considerable impact. In an article in *Frontiers in Behavioral Neuroscience* in 2009, Elizabeth C. Cottrell and colleagues reported that fetal exposure to maternal stress can influence later stress responsiveness.

Precipitating factors

Abbey discloses the feeling of being "trapped" in the caregiver role without emotional support. In 1990, Leonard I. Pearlin and colleagues introduced the term *role captivity* in *The Gerontologist* to refer to a sense of being an involuntary incumbent of the caregiver role. Having a sense of role captivity is a strong predictor of depressive symptoms in family caregivers.

Furthermore, Abbey appears to be getting involved in prolonged care for their ill mother without receiving sufficient emotional or social support from others. This can become a source of chronic stress and lead to subsequent negative consequences such as depression.

Perpetuating factors

Inflammation: We respond to acute stress via the hypothalamic-pituitary-adrenal axis and autonomic nervous system. Our bodies have negative feedback that can inhibit the fight-or-flight response or sympathetic activation once the immediate or perceived danger disappears. As Emily Deans reported in 2014 in *Psychology Today*, however, under conditions of chronic stress, the feedback tends not to work properly. According to Shonkoff and colleagues, this can lead to symptoms such as anxiety, depression, chronic gut problems, headaches, high blood pressure, etc.

In addition, Deans noted that when we are under stress, our bodies release inflammatory cytokines — little chemical messengers that bring a certain part of our immune system into a state of high alert. While inflammation saves us from pathogens (e.g., viruses), chronic inflammation also leads to chronic diseases such as depression, high blood pressure and autoimmune diseases (e.g., ulcerative colitis, multiple sclerosis). Furthermore, Eiko Fried and colleagues reported in 2019 in *Psychological Medicine* that specific depressive symptoms such as sleep issues and energy level are associated with increased inflammatory markers in the human body.

Abbey appears to be under chronic stress associated with providing prolonged caregiving without much outside support. Assessing this frequently in practice and helping Abbey with stress management becomes critical. More information about the links between inflammation and certain depressive symptoms is provided in the book *The Inflamed Mind* by Edward Bullmore.

The role of stress in brain-gut dialogue: Alexandra Labanski and colleagues wrote earlier this year in *Psychoneuroendocrinology* that stress induces alterations of the fecal microbiota and manipulation of the gut microbiota. This, in turn, can alter stress responses, underscoring the bidirectional dialogue between the brain and gut. J. Philip Karl and colleagues noted in 2017 in the *American Journal of Physiology-Gastrointestinal and Liver Physiology* that prolonged stress increased intestinal permeability, and this was concomitant with changes in intestinal microbiota composition and metabolism.

Mounting evidence suggests that the gut microbiome plays a pivotal role in educating and regulating our immune response, and this has clinical implications. In particular, the National Institutes of Health Human Microbiome portfolio analysis team reported in 2019 that specific conditions can trigger a normally benign or even beneficial microorganism to overgrow its habitants and become pathogenic. The overgrowth of these normally commensal members is speculated to lead to dysregulation of mucosal immunity and a disruption of gut barrier function. An example of this disturbed state is irritable bowel disease (IBD) and its disease subtypes, Crohn's disease and ulcerative colitis.

The role of dietary inflammation in mental illness: Abbey reports irregular, nutrient-deficient dietary patterns. In addition, Abbey does not drink much water but consumes sweetened sodas instead. In the literature, it has been reported by various researchers that highly processed, poor-quality foods are linked to increased risk for mental disorders. The gut and its resident microbiota are implicated in a pathway for this relationship.

Jacques Amar and colleagues noted in 2011 that high-fat-diet-induced alterations in GI permeability affect mental health. Additionally, Joseph Firth and colleagues wrote in 2019 in *Frontiers in Psychiatry* that given diet's role in modulating inflammatory processes, calorie-dense, nutrient-deficient, processed food intake may contribute to the heightened inflammation observed in severe mental illnesses.

Poor oral hygiene: Abbey is experiencing poor oral hygiene. Katrina Ray reported this year in *Nature Reviews Gastroenterology & Hepatology* that burgeoning evidence supports links between the oral-gut axis, microbiome and immune-mediated mechanisms in GI disturbances (e.g., development of IBD). Specifically, according to Ray, inflammation of the oral mucosa leads to the expansion of bad microorganisms in the oral microbiota. In mice, this process can promote colitis through colonization of the gut, and the induction and migration of bacteria-reactive T cells (a type of immune cell) to the gut.

In summary, oral inflammation can trigger gut inflammation. Although this was documented in rodents, it may also hold true for the mouth-gut dialogue in humans.

Protective factors

Abbey comes for individual counseling by self-referral. Abbey appears to be highly self-aware and willing to seek professional help. This must be acknowledged and validated in counseling because, as Anthony F. Jorm and colleagues reported in 2017 in *World Psychiatry*, in industrialized countries such as the United States, 36% to 50% of serious cases of mental disorders go untreated. Although Abbey does not appear to suffer from severe psychiatric symptoms yet, it is imperative for counselors to work with Abbey to provide early interventions or preventive interventions.

Clinical management

Considering the association between lifestyle behaviors (such as diet quality and diet patterns) and stress-driven symptoms, as well as gut health, wellness-oriented counselors should take a holistic approach to clinical management. Writing in *International Review of Neurobiology* in 2016, Samantha L. Dawson and colleagues said that an integrative strategy such as lifestyle medicine requires the development of appropriate diagnostic tools that incorporate assessment of health behaviors (e.g., physical activity, diet quality) to identify those who are particularly at risk and to encourage early intervention.

Given Abbey's clinical symptom profile, they would benefit most from an integrative, holistic strategy to clinical management provided by an interdisciplinary team of professionals (i.e., a counselor, a clinical dietitian or nutritional psychiatrist and, potentially, a gastroenterologist). In the following sections, we illustrate a way to conduct a case formulation with Abbey using the BPSL model.

Biological interventions

Abbey may be referred to a psychiatrist for potential psychopharmacological treatment to reduce their stress-induced symptoms. Also, microbiota-based approaches to Abbey's concomitant psychiatric and GI symptoms may be an area for exploration.

Anne K. Thomann and colleagues reported this year in *Alimentary Pharmacology & Therapeutics* that interactions between the gut microbiota and brain may play a role in the pathogenesis of the high comorbidity of psychiatric and GI symptomatology. However, these authors note that at this time, interventional studies investigating the tridirectional relationship between the gut microbiota, inflammation and behavior are still limited to preclinical work. Furthermore, these authors recommended in 2019 that potential confounding factors (e.g., childhood diet, trauma, home environment, early environmental exposure) that can alter our gut microbiome should be taken into account when formulating the clinical case.

Psychological interventions

Earlier this year in *JAMA Psychiatry*, Grant S. Shields and colleagues wrote that psychosocial interventions (e.g., psychotherapies) are associated with enhanced immune system function, as indexed by decreases in proinflammatory cytokines and increases in immune cell counts over time. Extensive evidence suggests that high levels of stress are associated with unhealthy inflammation in our bodies. In providing a psychological intervention, it is important for counselors to identify, understand and address a variety of interrelating stressors, such as grieving nondeath losses, that arise in the context of caregiving. The relationship between stress and inflammation can be addressed in counseling with Abbey, and counseling may be an effective strategy to approach stress-induced, immune-related symptomatology.

Abbey may benefit from a wide array of therapeutic interventions to address their stress-induced symptoms. For example, Stefan Hofmann and colleagues reported in 2010 in the *Journal of Consulting and Clinical Psychology* that mindfulness-based therapy (MBT) was particularly effective at helping to reduce stress. Jon Kabat-Zinn has defined *mindfulness* as a process that leads to a mental state characterized by nonjudgmental awareness of the present-moment experience while encouraging openness, curiosity and acceptance. Hofmann and colleagues noted that MBT is also effective for reducing symptoms of anxiety and depression across a

relatively wide range of severity, even when these symptoms are associated with medical problems.

MBT may encourage Abbey to relate differently to somatic and visceral sensations and reactions and to have a different experience in managing these symptoms when they occur. Additionally, it is important to maintain a holistic perspective on the role that Abbey's cultural background may play in their treatment.

Social interventions

The World Health Organization reported in 2014 that social interventions can play a strong protective role in recovery from psychiatric symptoms. Abbey might benefit from participating in peer support groups for family caregivers or groups such as the Family-to-Family education program provided by the National Alliance on Mental Illness.

This group modality is an evidence-based intervention known to reduce distress related to caregiving and to enhance emotion-focused coping. According to Lisa B. Dixon and colleagues in 2011 in *Psychiatric Services*, this intervention is measured by increased acceptance and improved problem-solving.

Lifestyle interventions

In 2014 in the *American Journal of Public Health*, Adrienne O'Neil and colleagues observed a negative relationship between a high-quality diet and mental health disturbances and a positive relationship between unhealthy diets and poorer mental health outcomes in children and adolescents. Similar results have been reported in the literature for adults.

Felice Jacka and colleagues noted in 2015 in the *Journal of Affective Disorders* that, overall, a quality diet that is high in fiber and nutrients has been associated with increased microbial diversity and gut health. Jacka and colleagues also suggested in 2017 in *BMC Medicine* that diets higher in plant-based foods are associated with a reduced risk for depression.

It may be a good idea, therefore, to refer Abbey to a clinical dietitian or nutritional psychiatrist for comprehensive dietary assessment and consultation to improve and sustain their dietary patterns. As a supplementary strategy to psychotherapy or pharmacotherapy, this will likely improve Abbey's seemingly stress-induced symptoms, including GI symptoms. ❖

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