Mental and Physical Health Concerns in the Context of COVID-19: Opportunities and Applications for Behavioral Medicine

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Numerous physical and mental health concerns have been documented in the context of COVID-19, and it is likely that patients, survivors, frontline health care workers, and other affected individuals will present to psychiatry for treatment. Behavioral medicine, an interdisciplinary field that is defined by a behavioral and biomedical conceptualization of clinical care, offers an opportunity for collaboration with psychiatry and other health care providers to meet the myriad needs resulting from the pandemic. This review summarizes a conceptual framework of behavioral medicine and clinical health psychology, COVID-19–related quality of life concerns that may be applicable to behavioral medicine referrals, clinical assessment directions, and intervention opportunities. The review combines both findings specific to COVID-19 and general behavioral medicine principles with an overall goal of providing a basic introduction to behavioral medicine practice, applications, and opportunities for management of medical and psychological symptoms.

Behavioral medicine refers to an interdisciplinary field of research and clinical practice that integrates behavioral (i.e., psychosocial, sociocultural, economic, environmental processes of health- and illness-related behavior) and biomedical (i.e., physiological, pathological, medical processes) knowledge and techniques to support prevention, diagnosis, treatment, rehabilitation, care, management, and health promotion (1). Many providers—including nurses, physicians, health educators, social workers, physical and occupational therapists, rehabilitation professionals, and psychologists—engage in behavioral medicine practices. Relatedly, clinical health psychology is a subdiscipline of behavioral medicine that is specific to clinical psychologists (2); the terms are often used interchangeably, as they represent the same overarching principles and strategies.

THEORETICAL FOUNDATION OF BEHAVIORAL MEDICINE

Several health behavior theories form the foundation for behavioral medicine practices within health care, including the health belief model (pertaining to the impact of knowledge and risk perception on health behavior and health service utilization) (3), social cognitive theory (pertaining to behavioral, individual, and environmental factors that affect health behavior) (4), and the transtheoretical model (which provides a framework for intentional behavior change) (5). In over 40 years since behavioral medicine was formally defined, the field has erupted with growth and innovation, bolstered by scientific findings such as the role of depression in cardiovascular health, as well as cultural shifts in medicine such as a growing focus on behavior change in disease prevention (1). There has been strong evidence for the role of behavior in the prevention, treatment, and management of common health conditions including chronic pain, cancer, cardiovascular diseases, diabetes, HIV/AIDS, and sleep disorders (6). The necessary role of behavioral medicine in modern health care has been highlighted in the context of the COVID-19 pandemic (7). The COVID-19 era has even been called "the golden age of behavioral medicine" to highlight the shift from behavioral medicine as a niche response to a purely biomedical model of disease to an innovative and well-respected multidisciplinary field that is often at the forefront of evidence-based approaches to all aspects of physical and mental health and illness (7).

COVID-19 IMPACTS

Although many patients recover from COVID-19 without significant morbidities, there remains a significant burden of both acute and postviral symptoms for others (8). One study found that over 87% of patients who had recovered from COVID-19 reported at least one lingering symptom, with fatigue and shortness of breath being the two most common when assessed at a mean of around 60 days after first symptom onset (9). Other concerns include physical (e.g., pain, headaches, dizziness) and chemosensory (e.g., loss or distortion of taste and olfaction) symptoms, cognitive

impairment (e.g., brain fog, poor concentration, difficulty focusing, forgetfulness), sleep disturbances, and mental health concerns (e.g., stress, adjustment difficulties, depression, anxiety, trauma, grief, loss) (8). Research from the severe acute respiratory syndrome and Middle East respiratory syndrome coronavirus outbreaks has suggested that clinically significant mental and physical health comorbid conditions may persist long after resolution of the acute infection (10, 11), and it is expected that the trajectory for COVID-19 survivors will mirror this long-term pattern (12). Caregivers, health care providers, and others have also reported a myriad of psychosocial concerns due to stress, social isolation, burnout, and other factors (13, 14). Thus, it is likely that individuals who have been affected by COVID-19 in different ways will present to psychiatry or other mental health settings for management of these concerns. In addition to providing traditional psychiatric care, it may be helpful to make referrals for multidisciplinary interventions to accommodate the diverse needs of those affected by the disease. As such, this article provides an overview of behavioral medicine and its potential applications to physical and mental health problems in the context of COVID-19.

Behavioral medicine offers multiple opportunities to understand, assess, and manage quality of life concerns related to COVID-19. Research that explicitly applies behavioral medicine principles to COVID-19 issues is in its infancy (15). However, evidence from the past several decades has demonstrated the effectiveness of this model across various health conditions (16), although, notably, the focus has been on chronic illness rather than infectious disease (7). For example, behavioral medicine assessment and intervention applications have been developed for use within health care settings (17) with much work on concerns that are relevant to COVID-19, including pain (18), adjustment to physical changes and symptoms (19), cognitive impairment (20), fatigue (21), sleep (22), and mental health (23). Given the relevance to the short- and long-term sequelae of COVID-19, there is a clear place for behavioral medicine practitioners to provide services in conjunction with psychiatry and other health care providers to best meet the needs of their patients. Although these opportunities relate to many aspects of COVID-19, including prevention, diagnosis, and treatment, the present focus is primarily in coping with the long-term impacts of COVID-19.

BEHAVIORAL MEDICINE ASSESSMENT OPPORTUNITIES FOR COVID-19

Evidence-based assessment is at the heart of understanding the patient and their specific concerns to inform intervention strategies within behavioral medicine settings. There are numerous goals to achieve, such as identifying individual (e.g., cognitive, psychopathological, coping), contextual (e.g., physical and social environment), and medical (e.g., disease parameters, treatment) factors that are relevant to the presenting concerns (24). Medical parameters for COVID-19

may include date of diagnosis, past and present treatments, symptoms from disease and treatment, hospitalization factors, acute disease duration, amount of time in survivorship, and comorbid conditions.

Although objective (e.g., actigraphy or sensors, laboratory serum, psychophysiological) and ecological momentary (e.g., real-time repeated measurement across varying time periods) assessments are common in behavioral medicine research (25), clinical evaluation is typically based on patient report, given that the criterion of interest is based on subjective concerns and experiences. However, other sources such as family, caregivers, and health care providers may also be utilized. Additionally, appropriate consideration to a patient's culture, language, age or developmental status, gender, and other relevant demographic characteristics should be factored into the assessment strategy (26).

Initial brief screenings may be conducted during regular clinic visits (e.g., primary care) or in specific behavioral medicine encounters with the goal of informing more detailed assessment needs and, ultimately, for triage, intervention targets, or both (24). Ongoing assessment is typical in clinical settings and useful to determine changes or shifts in symptomatology both during and after intervention (24). Ideally, a behavioral medicine clinician should be able to develop a case conceptualization for their client using data from the assessment by understanding their environment, strengths and weaknesses, psychopathology, medical symptoms and treatments, and current coping (24).

Assessment data may be gleaned from numerous sources, including a review of the medical chart; clinical interview; behavioral observation; standardized self-report scales that have demonstrated reliability and validity; and occasionally, psychophysiological measures of relevant targets (24). It is important to note that the self-report scales described in the following sections have not been specifically validated for application to COVID-19 contexts and that such work is a clear research direction for ensuring the utility of these measures. However, in the interim, behavioral medicine practitioners will likely rely on established scales with adequate psychometric properties that have been applied to other clinical populations, as long as that scale captures the desired information for a particular construct of interest.

An evaluation of emotional and psychosocial health is a standard part of any behavioral medicine assessment. General targets typically include symptoms of depression, anxiety, and traumatic distress, although other constructs may be warranted, depending on the context (24). These targets are of utmost importance, given the interference of mental health with presenting concerns, and they also provide a richer context for understanding the etiology and maintenance of the presenting issue (24). Numerous standardized scales with established psychometric properties are commonly used, including the Beck Depression Inventory-II (27) or Patient Health Questionnaire-9 (28) for depression, the Beck Anxiety Inventory (29) or General Anxiety

Disorder-7 (30) for anxiety, the Patient Health Questionnaire-4 for a brief combined assessment of depression and anxiety (31), and the Posttraumatic Stress Diagnostic Scale (32) or Impact of Events Scale-Revised (33) for traumatic stress. Substance use patterns are also typically evaluated; the Alcohol Use Disorders Identification Test-Concise (34) is frequently used for alcohol use, and diaries for tobacco and caffeine use are also relatively common. Additionally, there has been a growing interest in utilizing the Patient-Reported Outcomes Measurement Information Systems measures (PROMIS), which are available for a variety of relevant outcomes, such as pain, fatigue, and emotional distress (35).

In the following sections, we discuss potential assessment opportunities for consideration, in specific areas that are relevant to COVID-19, based on previous work and practice within behavioral medicine. Notably, the models described are broad; thus, a practicing clinician will tailor the strategy according to an individual patient's needs.

Acute or Lingering Symptoms
The myriad of symptoms experienced during acute COVID-19 infection and often for months afterward are significant quality-of-life concerns that can also contribute to fear, anxiety, depression, loneliness (36, 37), reduced ability to engage in activities of daily living (38), and other complications such as malnutrition (39). The uncertainty of duration can also contribute to distress for those living with the acute or lingering impacts of the virus. From a behavioral medicine perspective, efforts typically focus on adjustment to the presenting illness, not necessarily a full resolution of symptoms (40); thus, it is imperative that medical parameters and underlying disease are evaluated and addressed across collaborating members of the health care team.

Behavioral medicine assessment efforts for acute or lingering symptoms of COVID-19 may mirror those for adjustment to serious or chronic illness more generally. Details of the clinical interview will vary on the basis of concern but ideally would yield information regarding how the patient is managing their: symptoms and self-rating of related dysfunction, medical environment (e.g., hospital, clinic) and ongoing treatments, relationships with health care providers, emotional and mental status, self-image, social support with family and friends, and level of (un)certainty in symptom course and prognosis (24). After the broader interview, more specific data should be collected, often in the form of standardized questionnaires. These may vary by concern (e.g., pain assessments); but common targets typically include measures of psychosocial adjustment (e.g., Psychosocial Adjustment to Illness Scale) (41) and types of coping strategies being utilized (e.g., Ways of Coping Checklist-Revised) (42).

Fatigue
Both time-limited fatigue (<3 months) with a clear underlying cause and more pervasive, chronic fatigue that is longer in duration and lifestyle disruption have been reported in the context of COVID-19, with ongoing fatigue associated with depressive symptoms and decreased quality of life (43, 44). Numerous efforts have been made in other clinical populations to develop guidelines for fatigue assessment (45, 46), which may inform efforts for the current context. The primary modalities for the assessment of fatigue within a behavioral medicine framework are typically through interview, observation of behavior (e.g., facial expression, gestures, posture), and self-report questionnaires. Each provides slightly different but complementary information. Although interview and observation may provide a rich, holistic picture of a patient's fatigue, self-report measures are preferred for evaluating the experience, feelings, impairment, and activity limitations related to fatigue in a standardized way and to evaluate changes in fatigue during and after therapeutic intervention (45). Scales are often categorized as *unidimensional* (a single score that summarizes overall fatigue) or *multidimensional* (multiple subscales or scores that describe specific symptoms and behaviors as well as different aspects of fatigue such as psychological fatigue, physical fatigue, impact on functioning and daily activities, and fatigue-related distress) (46).

Various approaches have been used in preliminary work on evaluation of COVID-19 fatigue, including visual analog scales (47), the Brief Fatigue Inventory (48), the Fatigue Severity Scale (49), the Chalder Fatigue Scale (50), and the Multidimensional Fatigue Inventory (51). Because different scales are based on diverse conceptualizations of fatigue, the context (including presenting concern and patient goals) must be considered when choosing an appropriate measure in clinical contexts (46). At least one model of fatigue that is specific to COVID-19 has been proposed (52). Although there is not a clear behavioral medicine assessment strategy adjunct for this model, it reflects themes that both psychological and physical aspects of fatigue are worthwhile assessment targets. Comprehensive lists of measures that capture these targets are available elsewhere (46).

Sleep Disturbance
Changes in sleep duration and quality related to COVID-19 have been reported (53), which is concerning, given the numerous adverse impacts of insufficient sleep, including lowered immune response, cognitive dysfunction, and poor mood (54). A higher prevalence of sleep problems in patients with active COVID-19 is expected, given that symptoms such as coughing, fever, and breathing difficulties can impair sleep (54). However, there are also wide reports that those without an active COVID-19 infection and health care workers, specifically, have experienced sleep problems (53). From a behavioral medicine perspective, assessment for such concerns hinges on an understanding of the behavioral model of sleep wherein initial disruption to different facets of sleep becomes persistent (55). Within this model, *predisposing factors* (characteristics of an individual) interact with *precipitating factors* (new occurrences such as illness,

stress, and environmental or social changes), resulting in acute sleep disturbances (55). For example, prepandemic sleep quality is related to the effects of COVID-19 on sleep quality (56), as are fear and changes in routine and sleep-wake habits (53). Later, *perpetuating factors* that prevent reestablishing normal sleep (e.g., maladaptive strategies applied with the intent of ameliorating symptoms) can maintain these disturbances into longer term concerns (55).

Comprehensive sleep assessment within the behavioral medicine context typically focuses on gathering information on predisposing, precipitating, and perpetuating factors that may be affecting sleep, and the same would be anticipated for sleep assessments for the COVID-19 context. Potential sources include a two-week sleep diary and clinical interview to glean data on prediagnostic sleep history, sleep-wake habits and times, napping, daily activities, physical activity, caffeine consumption, sleep hygiene behaviors such as screen time before bed, medications or supplements being taken, subjective impact of sleep on daily functioning, and psychiatric symptomatology (57). Sleep environment factors should also be considered, including nighttime disruptions that are currently occurring or may have occurred during acute illness or hospitalization, level of daytime and nighttime light exposure, and amount of time spent in bed due to factors such as fatigue or pain, as is recommended in other illness contexts (58). Such information is integrated with data collected from a review of the medical chart and responses to standardized measures of sleep quality, sleepiness, and specific sleep disorders (e.g., insomnia) (57).

Numerous self-report questionnaires with established psychometric properties are available and commonly used in both research and clinical sleep medicine contexts. Measures are available to evaluate sleep in specific populations (e.g., cancer), but general scales may be useful for the COVID-19 context. Examples of widely used tools include the Pittsburgh Sleep Quality Index (59) to assess subjective sleep quality, the Epworth Sleepiness Scale (60) for sleepiness, and the Insomnia Severity Index (61) to evaluate symptoms of insomnia.

BEHAVIORAL MEDICINE INTERVENTION MODELS: POTENTIAL APPLICATIONS FOR COVID-19

There are many opportunities for assessment-informed behavioral medicine interventions for the management of concerns that may result from COVID-19. Evidence-based translational behavioral medicine refers to interventions with scientific evidence for effectiveness or efficacy that promote physical and mental health or prevent illness (or both) (62). A wide spectrum of evidence-based techniques and interventions offer potential applications for many COVID-19 concerns, including acute or lingering symptoms, fatigue, and sleep disruption, among others. Such interventions are commonly used in the treatment of mental health or psychosocial concerns as stand-alone

treatments, or in combination with pharmacological or other nonpharmacological approaches.

Because of the broad applications of behavioral medicine across providers and settings, it is important to emphasize interventions that are brief and can be integrated into existing care (17). Although behavioral medicine interventions were originally designed to be delivered in face-to-face settings, the field has been a leader in incorporating technology into interventions, starting early on with its focus on biofeedback to the present day, when it is common for behavioral medicine techniques to utilize wearable technology or be delivered virtually (63). Moreover, although behavioral medicine interventions were also initially more focused on individual-level behavior change, a broader view that more fully incorporates sociocultural factors, such as the role of systemic oppression of marginalized groups on enduring global health disparities, has been emphasized in recent years (64).

Given that many of the ongoing symptoms and concerns of COVID-19 are postexertional, an understanding of envelope theory (65) or spoon theory (66) models can also be useful for patients. These models assert that, often when patients are having better days with fewer symptoms, they will overexert themselves, leading to adverse symptoms postexertion (37). Many individuals experiencing symptoms may not be knowledgeable about long-haul COVID, and thus mental health professionals can play a valuable role in providing education, validation, and support that the experience of ongoing symptoms are being seen in many other patients and that there are health behavior approaches that can help (67).

Numerous techniques are widely used in behavioral medicine and clinical health psychology settings. Cognitive-behavioral therapy (CBT) and motivational interviewing (MI) are among the most common (17). However, the list of possible interventions is vast and includes acceptance and commitment therapy (ACT) and other modalities such as biofeedback, mindfulness, and relaxation training. A brief overview of these interventions that may be adapted for COVID-19 concerns is provided in the following sections. For each, it is important to remember that the individual's existing comorbid conditions, symptoms, treatments, roles (e.g., frontline health care worker, caregiver to a loved one), emotional-psychosocial health, and cultural context will affect both the individual's experience of the symptoms and necessary adaptations to treatments.

Cognitive-Behavioral Therapy

CBT is perhaps the most widely adopted behavioral medicine intervention strategy, with a strong evidence base supporting its utility for numerous physical and mental health–related problems. Best characterized as a goal-driven, time-limited approach, CBT targets the relationships among thoughts, feelings, and behaviors, with a focus on the effect of maladaptive thought patterns (e.g., catastrophizing) on behaviors (e.g., withdrawal) and functioning

(e.g., ability to perform daily activities) (68). That is, CBT presumes that many presenting concerns are at least partially due to having learned a particular behavioral pattern because of specific cognitive and environmental contingencies (69).

Treatment typically focuses on strategies to change both thought and behavioral patterns that perpetuate the presenting concerns, and it has been shown to be extremely effective in many populations (69), including those seeking management of medical concerns (70). Common CBT techniques include tracking (i.e., self-monitoring and charting specific thoughts and behaviors), increasing awareness of maladaptive thought patterns and situational factors, modifying these unhelpful thoughts and contexts, behavioral activation (i.e., scheduling and performing specific, meaningful activities), coping skills training, exposure (i.e., repeatedly facing a memory, situation, or physical sensation), role playing, and relaxation techniques (69). CBT also requires the patient to be actively involved in their treatment and to consistently practice learned skills outside of therapy sessions to achieve a desired level of improvement in symptoms and functioning (69).

Decades of research support the effectiveness of CBT for numerous applications that are relevant to COVID-19 symptoms. CBT has been applied to numerous facets of pain, including acute pain (71), arthritis (72), cancer (73), other types of chronic pain (74), and headache (75), with some positive outcomes. To this end, specific techniques for pain management typically focus on pain education, pleasant activity scheduling (identifying meaningful activities and plans to manage barriers to participation), activity pacing (maintaining consistent activity levels with regular rest intervals to avoid overactivity), relaxation training, and coping skills training (76). For taste and smell disorders, primary treatments typically focus on olfactory retraining (77, 78), and there are not formally proposed CBT applications for these concerns. However, protocols for adjustment to distressing symptoms in other chronic health conditions may be useful, with an emphasis on psychoeducation, coping skills training, changing attentional focus, and relaxation (79). Moreover, given the connection between taste and olfactory problems with psychological functioning (36), CBT may ultimately be best applied on mental health sequelae, of which there is significant evidence. Similarly, CBT is not considered a first-line treatment for cognitive impairment, but lessons learned from dysfunction in attention and executive functioning in other chronic diseases (80) provide potential directions for applications in the context of COVID-19. Given that other symptoms (e.g., depression, anxiety, disordered sleep) are known to be related to cognition, and there has been some documentation of this with regard to COVID-19 (81), multidisciplinary approaches that incorporate CBT techniques for mental health and sleep (discussed later) are warranted.

There is also support for CBT, especially with physical exercise, in improving symptoms of fatigue in a number of chronic health conditions, including cancer (82), multiple sclerosis (83), and other types of postviral fatigue such as chronic fatigue syndrome-myalgic encephalomyelitis (CFS-ME) (84). Some recommendations have been made for managing COVID-19–related fatigue using CBT based on CFS-ME protocols. These emphasize optimizing rest, relaxation training, education around energy conservation, and targeting cognitive (e.g., catastrophizing) and behavioral (e.g., overexertion to the point of exhaustion followed by prolonged underexertion) patterns (37).

CBT for insomnia (CBT-I) is a subtype of CBT designed to treat sleep-related concerns in a range of populations with medical morbidities (85). Protocols typically include a combination of sleep hygiene education, relaxation techniques, sleep restriction (strategies to reduce amount of time awake while in bed), challenging maladaptive cognitions (e.g., frustration about sleeping, labeling oneself as a "bad sleeper") and feelings (e.g., worry around bedtime), and altering behaviors (e.g., lying awake in bed, checking the time) that perpetuate sleep disruption (57). Although the evidence for CBT-I is compelling, especially for insomnia, there are barriers to its dissemination, including cost and the limited number of practitioners who are trained to deliver the treatment relative to the number of people living with sleep disorders (86). A stepped-care approach to sleep problems has been proposed, utilizing technology to enable self-led management of sleep using CBT principles before referring to more formal, expert-delivered interventions (87).

Motivational Interviewing

Clinicians may use MI either as a part of a CBT protocol or separately. MI is a patient-centered conversational style that seeks to increase and strengthen the internal motivation and empowerment needed to promote behavior change through the identification and exploration of ambivalence (88). Clinicians utilizing MI collaborate with patients, rather than directing them, and engage using a nonjudgmental, nonconfrontational, encouraging style (88). In contrast to CBT, there are not direct attempts to change maladaptive thoughts or behaviors in MI; rather, the clinician subtly encourages patients to notice and experience discrepancies between their current behavior and their goals (88).

MI has been shown to be effective for numerous targets in health care settings, with even a single session demonstrating benefit in enhancing motivation to reach health-related goals (89). Specific techniques that are commonly used include open-ended questions, affirmations (i.e., acknowledgment of patient strengths, efforts, and expertise), and reflective listening (i.e., empathetically summarizing patient statements) (88). Although MI has primarily been used for COVID-19 vaccine hesitancy (90), there are certainly other avenues for application, particularly as a vehicle to motivate treatment seeking and adherence. For example, MI has demonstrated such benefits in samples with pain (91), fatigue (92), and other chronic health conditions (93), which

suggests opportunities for COVID-19 treatment applications as well.

Acceptance and Commitment Therapy

Although CBT's emphasis on challenging maladaptive thought patterns and behavioral activation can be useful in many settings, ACT offers a valuable alternative especially for some patients in health settings who may find CBT's focus on challenging thoughts as invalidating to their lived experience. ACT is considered a "third wave" therapy that grew out of traditional CBT with a primary focus on psychological flexibility and the acceptance of difficult thoughts, feelings, experiences, and behaviors to commit to actions that are aligned with values and goals (94). Unlike CBT, which promotes active change, ACT emphasizes that an event itself (e.g., a thought, grief, fear, illness, bodily sensation) may not be eliminated or changed and that attempts to do so are counterproductive (94). Rather, the focus is on shifting one's perspective about the event and concurrently engaging in values-consistent behavior that supports growth and meaning despite the adverse event (94). ACT has yielded positive outcomes in medical domains, especially for addressing health behavior, pain, and anxiety, among others (95, 96). To achieve these outcomes, ACT includes techniques such as mindfulness (focus on the moment rather than ruminating on past or future), defusion (observing events nonjudgmentally and not trying to control them), acceptance of discomfort, values exploration (identifying hopes and goals that matter most), and committed action to behaviors in alignment with values (94).

ACT is potentially more acceptable than CBT for some patients who are managing acute or lingering symptoms, given its shift in emphasis from controlling or reducing symptoms to a greater flexibility in living a value-driven life, even in the presence of uncomfortable symptoms. Indeed, ACT has been found to be effective in chronic pain contexts on numerous outcomes, including increasing pain acceptance, pain tolerance, flexibility, and functioning (97). Web-based ACT has also been successfully used for chronic pain (98), which could increase accessibility to this therapeutic approach. There have also been promising applications for ACT to mitigate cancer-related fatigue (99) and postviral CFS-ME fatigue (100), pointing to the potential feasibility of ACT for COVID-19 fatigue. Sleep has rarely been studied from an ACT lens, but acceptance-based approaches have been proposed for managing related concerns (101), and there is some evidence that ACT improves sleep when more traditional CBT-I approaches have not been effective (102). Similarly, there is less work on other symptoms and concerns relevant to COVID-19, but there has been some support for the utility of ACT in other long-term health conditions (103). Although the low number of high-quality studies in this area bars consensus recommendations for the application of ACT in these contexts (103), it is certainly an avenue for opportunity in behavioral medicine practice and may be strongly considered for COVID-19 concerns, particularly if a patient sees the ACT framework as appealing.

Other Modalities

Numerous other techniques may be applied in the COVID-19 context as stand-alone treatments or within one of the aforementioned therapeutic protocols. Biofeedback is a mind-body technique that provides patients with biological feedback (e.g., heart rate variability, blood pressure, respiration) to increase awareness of the connection between thoughts and physical symptoms to subsequently enhance control over physiological symptoms, especially those exacerbated by stress (104). Mindfulness is an intentional awareness of the present moment without judgment (105). Numerous relaxation training and stress management techniques have also been developed, including diaphragmatic breathing (an exercise aimed at taking deep breaths with focused awareness on breathing) (106), visualization and guided imagery (clinician-, self-, or audio-guided description of peaceful mental images or experiences) (107), progressive muscle relaxation (systematically tensing and releasing various muscle groups) (108), and autogenic training (repeating a series of statements about heaviness, warmth, relaxation, and bodily temperature to influence autonomic nervous system reactivity) (109). Combining these therapies with physical activity has also been found to be more effective in improving symptoms than stand-alone relaxation or even cognitive techniques (110); this suggests a pertinent role of physical activity as a potential adjunct to any of these modalities.

CONCLUSIONS

This review describes behavioral medicine and clinical health psychology frameworks and existing assessment and intervention applications that may be relevant for referrals from psychiatry in the context of COVID-19. The interaction of medical and psychiatric symptoms is at the forefront of this approach, which offers an opportunity for existing models of care from a behavioral medicine lens to be adapted to meet the needs of the moment. It will be essential to evaluate behavioral medicine service delivery specifically for the COVID-19 context moving forward, but in the interim, these numerous behavioral medicine practices have been widely used and deemed effective for numerous physical and mental health concerns. As such, referrals to behavioral medicine practitioners for patients presenting for psychiatric care or seeking other mental health care may offer an augmentation to total patient care in the context of COVID-19.

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