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How the Physical Long-Haul Symptoms of COVID-19 Influence Occupational Performance From a Person-Environment-Occupation Perspective: A Critically Appraised Topic

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Focused Question

What person, environmental, and occupational factors should be most prominent in occupational therapy evaluation and intervention planning when working with adult clients experiencing long-haul physical Coronavirus 2019 (COVID-19) symptoms?

Case Scenario

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), more commonly known as COVID-19 (World Health Organization [WHO], 2022a), has caused a worldwide pandemic, leading to significant impacts on human health. In the U.S., there are over 78,000,000 cases to date (World Health Organization [WHO], 2022b). Globally there are over 469,000,000 confirmed cases of COVID-19 to date (World Health Organization, 2022b). Individuals at an advanced age, who have an elevated body mass index, are immunosuppressed, or experience other comorbidities are at a higher risk for a severe infection than a younger individual or someone with no underlying health conditions (Vanichkachorn et al., 2021). COVID-19 affects people in various ways resulting in mild to moderate illness. The most common symptoms include fever, dry cough, and tiredness (Bharati & Sahu, 2022). Following the diagnosis of COVID-19, many individuals experience symptoms that have long-lasting effects. At this time, there is not a universally accepted term for the symptoms people are experiencing following COVID-19 (Vanichkachorn et al., 2021). However, for this critically appraised paper, the lingering symptoms people experience four weeks post COVID-19 diagnosis will be referred to as *long-haul COVID-19 symptoms* (Nath, 2020). Additionally, the population of focus will be adult clients 17 years of age and older.

For the purpose of this critically appraised topic (CAT) paper, occupations will be defined using the Occupational Therapy Practice Framework: Domain and Process Fourth Edition. Occupations addressed in the practice framework include activities of daily living (ADLs), instrumental activities of daily living (IADL), health management, rest and sleep, education, work, play, leisure, and social participation (American Occupational Therapy Association [AOTA], 2020). ADLs are defined as “activities that are oriented towards taking care of one's own body and are completed on a daily basis” (AOTA, 2020, p. 30). IADLs are defined as “activities that support daily life within the home and community and that often require more complex interactions than used in ADLs” (AOTA, 2020, p. 30). Health management is defined as “activities related to developing, managing, and maintaining health and wellness routines, including self-management, with the goal of improving or maintaining health to support participation in other occupations” (AOTA, 2020, p. 32). Additionally, rest and sleep are defined as “activities relating to obtaining restorative rest and sleep to support healthy, active engagement in other occupations” (AOTA, 2020, p. 32). Work is defined as “labor or exertion related to the development, production, delivery, or management of objects or services; benefits may be financial or nonfinancial” (AOTA, 2020, p. 33). Education is defined as “activities needed for learning and participating in the educational environment” (AOTA, 2020, p. 33). Play is defined as, “activities that are intrinsically motivated, internally controlled, and freely chosen and that may include suspension of reality” (AOTA, 2020, p. 34).Whereas leisure is a, “nonobligatory activity that is intrinsically motivated and engaged in during discretionary time, that is, time not committed to obligatory occupations such as work, self-care, or sleep” (AOTA, 2020, p. 34). Social participation is, “activities that involve social interaction with others, including family, friends, peers and community members, and that support social interdependence” (AOTA, 2020, p. 34).

Increased understanding of the effects of long-haul COVID-19 symptoms that clients experience is crucial for the development of rehabilitative evaluation and intervention processes amongst occupational therapists. Sykes et al. (2021) found that 86 percent of people report having at least one symptom of long-haul COVID-19 approximately 113 days after diagnosis. One of the most common long-haul COVID-19 symptoms is fatigue (Bharati & Sahu, 2022). Additionally, weakness and chronic fatigue that persist for an extended period affect the health of adults and their functioning, which leads to individuals feeling disabled emotionally and cognitively (Bharati & Sahu, 2022). Similarly, persisting symptoms have been found to have a significant effect on individuals with COVID-19 as they struggle to return to both their family and work roles, which may lead to increased financial hardships (Davis et al., 2021).

Occupational therapists have a critical role in COVID-19 rehabilitation as they seek to help others return to premorbid functioning. Sykes et al. (2021) addressed the importance of meeting clients where they were and focusing on rehabilitation at that point rather than seeking further diagnosis and advanced care. Occupational therapists have qualifications that can assist clients in recovery from long-haul COVID-19 symptoms as supported by their scope of practice, including health promotion, activity analysis, energy conservation, lifestyle modification, functional cognition, and an understanding of consequences resulting from occupational deprivation (Wilcox & Frank, 2021). When considering cultural aspects on which occupational therapists should focus, it is important to keep practices client-centered. In a case study review, Mannion and Sullivan (2021) described their use of establishing client-centered goals while considering the client's supporting and inhibiting factors, values, roles, and routines.

Additionally, amidst the COVID-19 pandemic, various groups of people have been identified as vulnerable. These groups include older adults, those with ill-health or comorbidities, homeless or underhoused people, and people from a gradient of socioeconomic groups that struggle to cope financially, mentally, and physically with the pandemic (The Lancet, 2020).

Similarly, culture has a significant role in health-related outcomes resulting from the COVID-19 pandemic. There is a greater need for health equity across public health. COVID-19 data has shown that African American, Hispanic/Latino, American Indian, and Alaska Native people in the U.S. have endured higher rates of COVID-19 related hospitalization and death compared to White populations (Centers for Disease Control and Prevention [CDC], 2022). The COVID-19 pandemic has brought to light social and racial injustice as there are more COVID-19 related hospitalizations, deaths, and overall cases in areas where racial and ethnic minority groups live and complete occupations such as education, work, play, and worship (CDC, 2022). Additionally, racial and minority groups have higher rates of medical conditions that increase their chances of severe illness after the contraction of the COVID-19 virus (CDC, 2022). However, further research on culture relating to COVID-19 is needed.

Considering theory, the Person-Environment-Occupation Model (PEO) was the best fit for the question of focus. The PEO model considers transactions between the person, the environments the person is in, the occupations the person completes, and the goodness of fit between these three transactional dimensions (Baptiste, 2017). Additionally, the model encompasses how the fit of the person, environment, and occupation can change across the lifetime (Baptiste, 2017). After individuals are diagnosed with COVID-19, it is crucial to consider physical implications for the person in their daily lives, such as fatigue, breathlessness, weakness, and post-exertional malaise (Baharti & Sahu, 2022; Davis et al., 2021; Michelin et al., 2021). Additionally, it is important to note how the experience of physical symptoms such as those influence the goodness of fit in the person's environment and occupations.

Purpose Statement

An increasing number of adults continue to experience the long-term physical effects of COVID-19. Currently, there is uncertainty regarding the best practices in occupational therapy to address long-haul COVID-19 symptomology and its effects on people as research on the topic continues to emerge (Robinson et al., 2021). The purpose of this critically appraised paper is to identify prominent areas on which occupational therapists should focus during evaluation and intervention planning while considering the person, environment, and occupation to encompass the ideals of best practice when working with adult clients who are facing disruptions as a result of long-haul COVID-19 symptoms.

Methodology

An initial literature search was conducted from March 4, 2022 to March 9, 2022. Searches were conducted on occupational therapy and multidisciplinary databases, including CINAHL, PubMed, American Journal of Occupational Therapy, WILEY, and Journal of Medical Virology. Articles that studied mental or cognitive impacts and populations of minors were excluded. Additional exclusions were articles that were not in English. The following terms were used to search the databases: “adults,” “coronavirus,” “COVID-19,” “SARS-CoV-2,” “effects,” “long haul,” “long covid,” “long haul covid,” “long term effect,” “physical,” “physical impact,” “physical implication,” “physical effect,” “physical effects,” “impairment,” “middle age,” “long term physical issues,” “occupational therapy,” “effects,” “long term COVID-19 symptoms,” “working population,” “intervention,” “quality of life,” “cultural impact” The terms “AND” or “OR” were used between each search phrase to have a more cohesive search.

Types of Articles Reviewed

In total, 30 articles were reviewed, and 17 articles were selected for further review. Of the 17 articles reviewed in-depth, the types of articles reviewed included one level I study (Michelin et al., 2021), one level II study (Moreno-Pérez et al., 2021), three level III studies (Halpin et al., 2021; Huang et al., 2021; Qu et al., 2021), three level IV studies (Adams et al., 2021; Davis et al., 2021; Mannion & Sullivan, 2021), and nine level NA studies (Bharati & Sahu, 2022; Caldaria et al., 2022; Cirotea et al., 2021; Robinson et al., 2021; Sykes et al., 2021; The Lancet, 2020; Vanichkachorn et al., 2021; Watters et al., 2021; Wilcox & Frank, 2021). Other resources reviewed included professional resources (AOTA, 2020; Baptiste, 2017; Kay, 2015; National Board for Certification in Occupational Therapy [NBCOT], 2021) and government websites (CDC, 2022; WHO, 2022a; WHO, 2022b).

Description of Evidence

At this time, there is extremely limited published research evidence on the long-haul physical symptoms of COVID-19. Most of the research evidence was found in clinical studies, observation, interviews, journal issues, and public health policy perspective papers. The majority of evidence evaluated in this critically appraised paper is level NA research, indicating the need for more published research with high rigor and levels of evidence regarding COVID-19.

As research on the topic continues to emerge, a significant gap exists within currently published literature concerning long-haul COVID-19 and its influence on culture. Additionally, there is a lack of demographic information and its influences on long-term physical effects. There is an identifiable need for further research in these areas to better understand how long-haul COVID-19 affects specific populations in relation to each other.

Further research on the long-haul symptoms of COVID-19 will increase the understanding of best practice in occupational therapy evaluation and intervention for individuals experiencing occupational performance deficits as a result of physical long-haul symptoms.

Synthesis

Theoretical Base

The overall goal of this CAT paper was to determine which aspects of occupational therapy evaluation and intervention planning are most prominent regarding person, environmental, and occupational factors for adults with long-haul COVID-19 symptoms. To increase further understanding of this topic, this CAT paper was considered from an occupational therapy perspective using the theoretical-based model, Person-Environment-Occupation (PEO) (Baptiste, 2017). The literature provided an analysis of how personal factors, environmental factors, and occupational factors were implicated as a result of individuals experiencing long-haul symptoms following COVID-19 (Adams et al., 2021; Bharati & Sahu, 2022; Halpin et al., 2021; Huang et al., 2021; Vanichkachorn et al., 2021; Watters et al., 2021; Wilcox & Frank, 2021). Individuals who experienced long-haul COVID-19 experienced various symptoms, including breathlessness, myalgia, anxiety, extreme fatigue, low mood, and sleep disturbances (Sykes et al., 2021). Implications of these symptoms were relevant when considering the impact on the person, environment, and occupation (Baptiste, 2017).

Symptoms associated with the Person

In a systematic review, Michelen et al. (2021) reported the most common symptoms of long-haul COVID-19 included weakness, general malaise, fatigue, concentration impairment, and breathlessness. Additionally, Bharati and Sahu (2022) indicated in their public health perspective article that the most prevalent symptoms of long-haul COVID-19 included weakness and chronic fatigue that persisted for extended periods for patients that recovered from COVID-19. Similarly, Davis et al. (2021) conducted a survey and found that the most reported symptoms after six months of being diagnosed with COVID-19 included fatigue, post-exertional malaise, and cognitive dysfunction. In the systematic review conducted by Michelen et al. (2021), 37 percent of patients reported a reduction in quality of life resulting from the lingering symptoms occurring following the diagnosis of COVID-19. These findings were supported by Bharati and Sahu (2022) as they found that individuals experiencing weakness and fatigue were faced with implications to their overall functioning that led to them feeling disabled both emotionally and cognitively. Additionally, Qu et al. (2020) conducted a survey that discovered that patients with COVID-19 who were not experiencing physical symptoms following discharge displayed a significantly higher quality of life scores relating to their health compared to those who were experiencing physical symptoms after discharge. The prevalence of long-haul COVID-19 symptoms leads to psychological distress within the person, as supported by a prospective cohort study conducted by Moreno-Pérez et al. (2021), who indicated the possibility of a correlation between a person's psychological distress and their quality of life.

How Physical Symptoms are Impacting Occupation

Along with physical symptoms of COVID-19 came significant deficits in occupational performance. The physical symptoms experienced by individuals with long haul COVID-19 have the potential to impact all areas of occupation, including Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), health management, rest and sleep, education, work, play, leisure, and social participation (AOTA, 2020). However, for the purpose of this CAT paper, the most significant occupations found in the research were emphasized.

An area of occupation with notable impact was work. Individuals with mild to severe long-haul COVID-19 symptoms have had severe cognitive deficits, which have influenced their decline in occupational performance at work several months following initial diagnosis (Watters et al., 2021). Additionally, in a scoping review, Vanichkachorn et al. (2021) found that one in

three participants in their study had returned to unrestricted work duty, meaning that one out of three participants were still experiencing restrictions in their work. Similarly, through a case study, Wilcox and Frank (2021) found their patient felt disengaged from their work roles as a nurse in an intensive care unit and felt a sense of hopelessness in their ability to return to work while coping with the nature of their symptoms. Similarly, in a service evaluation study, Halpin et al. (2021) addressed the need for further research on intensive care unit (ICU) COVID-19 survivors and the impairments on physical functioning and quality of life. Halpin et al. (2021) addressed in the discussion that two-thirds of previously employed intensive care unit survivors were unemployed due to the inability to meet physical demands for work as a result of the symptoms associated with Severe Acute Respiratory Syndrome (SARS). The Genomic characterization of SARS is nearly 80 percent the same as the genomic characterization of COVID-19, but SARS is slightly different as it contains additional gene regions (Caldaria et al., 2020). Given the biological and pathological similarities between the two viruses, it was noted the potential similarities for work-related implications in COVID-19 ICU patients (Halpin et al., 2021).

With work being negatively affected by physical symptoms, it is essential to consider the cultural beliefs associated with work amongst adult populations. Current adult populations consist of traditionalists, baby boomers, generation X, and millennials, each of which has varying generational characteristics (Kay, 2015). A common theme among these generations is the meaning of work. In the traditionalist generation, work is most important in identity (Kay, 2015). Similarly, with the baby boomer generation, self-worth is tied to work (Kay, 2015). For those that fall within generation X, status is tied to performance in work with loyalty to their career (Kay, 2015). Lastly, millennials value work structure and desire flexibility (Kay, 2015). Physical symptoms of long-haul COVID-19 and their influences on the inability of individuals to return to work create a cultural disruption due to the high value of work within current adult generations (Vanichkachorn et al., 2021).

Another area of occupation affected by long-haul COVID-19 physical symptoms was IADL performance. In the aforementioned case study conducted by Wilcox and Frank (2021), the patient experienced tachycardia and shortness of breath while completing IADLs such as cleaning the bathroom and carrying in groceries. It was noted that this patient had laboratory testing done as a result of a medical evaluation to investigate the causes of her symptomatology (Wilcox & Frank, 2021). The laboratory results were all within normal limits (Wilcox & Frank, 2021). Since the results were within normal ranges, yet the patient was experiencing significant deficits in performance, the patient was referred to occupational therapy to address further symptom management (Wilcox & Frank, 2021).

Social participation was another occupation related to the physical long-haul symptoms of COVID-19. The patient reported in the previous case study addressed limited community participation and variable engagement in leisure, social and restorative occupations (Wilcox & Frank, 2021). Social participation is important in increasing overall well-being as suggested in a community based behavioral intervention study conducted by Adams et al. (2021), who found individuals who had a strong social support system with connections to others reported greater satisfaction with quality of life, holistic well-being, and less mental health concerns. Essentially, Adams et al. (2021) addressed the importance of social participation in regard to the COVID-19 pandemic.

Additionally, rest and sleep was another area of occupation that long-haul COVID-19 physical symptoms have impacted. Rest and sleep was addressed in a cohort study conducted by

Huang et al. (2021), who found in their study of 1733 individuals that 26 percent reported difficulties with the occupation of rest and sleep as a result of long-haul COVID-19. Additionally, in the case study conducted by Wilcox and Frank (2021), their patient reported irregular sleep-wake cycles and fatigue that could keep them bedbound for two to three days at a time. The findings from the two studies (Huang et al., 2021; Wilcox & Frank, 2021) suggested that rest and sleep is a primary area of occupation impacted by individuals experiencing long-haul COVID-19.

How Physical Symptoms Impact Client's Affect

A relationship between a client's experience with lingering physical symptoms of COVID-19 and the client's affect has also been noted in research (Wilcox & Frank, 2021; Bharati & Sahu, 2022). In a case study conducted by Wilcox and Frank (2021), the patient experienced disengagement from her roles as a nurse, daughter, homemaker, and yoga participant. Additionally, the client was tearful during the interview and expressed feelings of helplessness during the evaluation while also reporting feelings of anxiety and hopelessness (Wilcox & Frank, 2021). The findings from the previous case study coincided with findings reported by Bharati and Sahu (2022), where they reported that feelings of fatigue and weakness influence a person's health and overall functioning while making them feel disabled both emotionally and cognitively.

Role of Occupational Therapy in Management of Long-Haul COVID-19 Symptoms

Occupational therapy uses a holistic approach to examine a client's occupational participation, roles, and their surrounding environment, while assisting clients with adapting to change by addressing all aspects of recovery, which extends beyond just physical implications (National Board for Certification in Occupational Therapy [NBCOT], 2021). Because of this, occupational therapy can be utilized to manage long-haul COVID-19 physical symptoms.

Cultural Considerations of Occupational Therapists

It is important for health care providers to consider cultural aspects when working with clients, as evidenced by individuals who have experienced current and historical racism and discrimination (CDC, 2022). Previously mentioned in this CAT paper was data indicating that African American, Hispanic, American Indian, and Alaska Native persons in the United States have experienced higher rates of hospitalization and death than non-Hispanic White populations (CDC, 2022). Individuals who experience discrimination and racism may have increased distrust of the healthcare system, including vaccines, vaccination providers, and institutions that make recommendations for vaccines (CDC, 2022). Furthermore, The Lancet (2020) editorial suggested that individuals in lower socioeconomic groups typically do not have private medical insurance, which can lead to financial hardships, poor health outcomes, or both. As a result, it is important for healthcare providers to encourage COVID-19 testing and prevention methods in clients at high risk for contracting COVID-19 (CDC, 2022).

Benefits of Occupational Therapy

Occupational therapy can be beneficial for individuals facing occupational performance deficits due to long-haul COVID-19 symptoms. In a journal issue, Ciortea et al. (2021) addressed the main objectives of occupational therapy in post-COVID-19 recovery. The occupational therapy objectives included restoring previous abilities including a focus on amplitude, strength, endurance and coordination during activities (Ciortea et al., 2021). Similarly, education consisting of motor, psychomotor, and sensory were all focus areas (Ciortea et al., 2021). Additional areas of focus included family integration, adaptation and integration in daily life

roles both socially and professionally, assisting clients in achieving maximum independence in daily living, and adapting the environment to meet the client's abilities (Ciortea et al., 2021).

Finally, through a public health issue, Watters et al. (2021) asserted that occupational therapists could use strategy training to facilitate long-term improvement in occupational performance. Strategy training consisted of educating clients on various strategies to assist in overcoming barriers in occupations as a result of long-haul physical COVID-19 symptoms (Watters et al., 2021). Watters et al. (2021) and Ciortea et al. (2021) indicated how person, environment, and occupation are addressed through occupational therapy services.

Occupational Therapy and the Environment

The person's environment (Baptiste, 2017) is carefully considered through the holistic perspective of an occupational therapist. The process of occupational therapy evaluation involves identifying areas of the environment that are supports and barriers which affect the client's occupational performance as they navigate their daily lives (American Occupational Therapy Association [AOTA], 2020). In the case study conducted by Wilcox and Frank (2021), the client received occupational therapy services in two environments: in-person clinic visits and remote telehealth services. Also considered were the delivery methods in which the client received occupational therapy services. (Wilcox & Frank, 2021). Furthermore, adaptations to the person's environment were described by Bharati and Sahu (2022) in their implementation of a conservation program, work simplification techniques, and assistive and adaptive devices. Some of the conservation techniques included modification and adaptation to the person's environment, including reorganizing areas to have frequently used items nearby, using a stool during activities, temporarily adding rails attached to walls for toileting and supported standing, changing the time of day the activity is completed, and using adaptive and assistive devices, such as a reacher (Bharati & Sahu, 2022). Similarly, adaptation of the environment was addressed by Ciortea et al. (2021), who suggested the environment should be adapted under the guidance of an occupational therapist who evaluates the home and professional environment to meet the person's functional abilities. This suggestion further relates to Bharati and Sahu's (2022) statement that energy conservation programs should be client-centered and meet each client's abilities and needs.

Limitations of Services:

Alternatively, a barrier to service delivery includes the lack of transferability of the energy conservation program to the general population outlined in Bharati and Sahu's (2022) article, as the program is tailored to each client's needs. Additionally, a lack of service availability, products specific to the requirements, and financial barriers are implications for using an energy conservation program (Bharati & Sahu, 2022).

Currently, there is a significant lack of research regarding long-haul COVID-19 symptoms as studies continue to emerge, resulting in limitations for best practice. Ciortea et al. (2021) stated the severity, incidence of dysfunction, and disability of COVID-19 is still unknown, but suggested the need for rehabilitation services throughout the illness, including long-haul symptom management. Additionally, Michelin et al. (2021) pointed to the need for further research to refine definitions regarding what long-haul COVID-19 encompasses.

Summary

Overall, 30 articles were reviewed, and 17 were chosen for further review. The articles included topics on long-term effects of COVID-19, long-haul COVID-19 symptoms, case studies on patients experiencing long-haul COVID-19 symptoms, interventions for people with long-

haul COVID-19 symptoms, and similarities between COVID-19 and SARS. The following main points were found:

- Meaningful occupations such as work, social participation, IADL performance, and rest and sleep are affected by long-haul COVID-19 due to associated symptoms such as fatigue, weakness, malaise, breathlessness, and others which impair the individual's ability to fully engage (Huang et al., 2021; Michelen et al., 2021; Vanichkachorn et al., 2021). Therefore, introducing occupational therapy interventions that address the area of occupation and symptom management may help to eliminate these deficits by allowing for increased participation in occupations.
- The affected individual's environment plays an integral part in symptom management and occupational accessibility (Baharti & Sahu, 2022). Although further research is needed regarding best practice methods, it is inferred that occupational therapists can help improve occupational performance by identifying supports and barriers available to the client and making adaptations as best fit (Baptiste, 2017).

The objective of researching this topic was to examine the physical effects of long-haul COVID-19 on adults and explore which areas of the person, environment, and occupation are of most importance when considering the potential benefits of occupational therapy. A review of the research indicates that guidance for best practice is limited due to a lack of published studies regarding the progression and long-term effects of COVID-19.

Clinical Bottom Line

What person, environmental, and occupational factors should be most prominent in occupational therapy evaluation and intervention planning when working with adult clients experiencing long-haul physical COVID-19 symptoms?

The emerging literature on COVID-19 long-haul physical symptoms supports occupational therapy services as an effective way to manage long-haul COVID-19 physical symptoms. However, further research is needed to understand areas of best practice regarding occupational therapy services for clients experiencing long-haul COVID-19 physical symptoms. To further understand the impacts of long-haul COVID-19 physical symptoms and how it relates to occupational therapy evaluation and intervention, the PEO model was used to address the person, occupation, and environmental factors (Baptiste, 2017).

In an additional attempt to further understand the effects of COVID-19 long-haul physical symptoms on adult populations, thorough research was conducted. The findings from the research included information on person factors, including symptoms of extreme fatigue, chronic fatigue, post-exertional malaise, cognitive dysfunction, weakness, psychological distress, concentration impairment, breathlessness, and a reduction in quality of life (Bharati & Sahu, 2022; Davis et al., 2021; Michelin et al., 2021; Moreno-Pérez et al., 2021). Accompanying the physical symptoms are effects on occupational performance.

Areas of occupation addressed in the critically appraised paper are work, IADL performance, social participation, and rest and sleep (Adams et al., 2021; Halpin et al., 2021; Huang et al., 2021; Vanichkachorn et al., 2021; Watters et al., 2021; Wilcox & Frank, 2021). Cognitive deficits impacted occupational performance at work following COVID-19 (Watters et al., 2021). Similarly, Vanichkachorn et al. (2021) found one-third of the participants in their study to be on restrictive work duty, indicating an inability to perform to their full potential. The findings from the study were supported by a case study by Wilcox and Frank (2021), which found the client to be disengaged from work roles with feelings of hopelessness in their abilities to return to work while coping with the nature of the symptoms they were experiencing.

Findings also suggested the similarity of SARS to COVID-19, with nearly 80% of the same genomic characterizations between the two viruses (Caldaria et al., 2020). Because of the similarities between the two viruses, Halpin et al. (2021) noted that two-thirds of previously employed ICU survivors became unemployed due to their inability to meet work requirements because of their long-term symptoms associated with SARS. Further research is necessary to determine if similar results will occur in adults experiencing long-haul COVID-19.

The other area of occupation that was impacted included IADL performance. A case study conducted by Wilcox and Frank (2021) addressed IADL performance as the client experienced physical symptoms that affected the completion of basic home management tasks. Similarly, Wilcox and Frank (2021) found that social participation was another occupation that was disrupted as a result of physical long-haul COVID-19 symptoms. The client experienced limited community participation and social occupations, which was a result of their long-haul COVID-19 symptoms (Wilcox & Frank, 2021). Rest and sleep is the final occupation examined in this CAT paper analysis. In a cohort study, Huang et al. (2021) found that 26% of their sample population experienced difficulties with the occupation of rest and sleep as a result of long-haul COVID-19. This was further supported by Wilcox and Frank (2021) in their case study, as the client reported irregular sleep-wake cycles accompanied by fatigue that could keep them in bed for 2-3 days at a time.

Occupational therapy has a significant role in managing long-haul COVID-19 physical symptoms through the practitioner's holistic approach in examining all areas of the person including their occupational participation, roles, and the environment (NBCOT, 2021). Ciortea et al. (2021) established the main purpose of occupational therapy in recovery of long-haul COVID-19, which included restoration of previous abilities, education on motor and sensory areas, family integration, adaptation and integration in daily life roles, assisting clients to be independent, and adapting the environment to meet the client's needs.

In addition, occupational therapists should take into account cultural considerations. Culture has had a significant role in health-related outcomes for vulnerable groups and those who have been racially marginalized (CDC, 2022; The Lancet, 2020). Individuals in the categories of older adults, homeless, underhoused, ill-health or comorbidities, and people from lower socioeconomic status are groups known to be vulnerable in the COVID-19 pandemic (The Lancet, 2020). Additionally, data has identified African American, Hispanic/Latino, American Indian, and Alaska Native people in the U.S. to endure higher rates of COVID-19 hospitalization and death than white populations (CDC, 2022). Similarly, there are more cases overall in areas where there are racial and ethnic minority groups living and participating in education, work, play, and worship (CDC, 2022). Racial and minority groups have also been found to have higher rates of medical conditions that increase the severity of illness with the contraction of COVID-19 (CDC, 2022). However, given these considerations, further research on cultural aspects relating to long-haul COVID-19 physical symptoms is necessary.

Occupational therapy considers the environment a person occupies carefully through a holistic perspective of assessing the barriers and supports within the person's environment (AOTA, 2020). Adaptations to the environment were addressed by Bharati and Sahu (2022) through their suggestions for implementing an energy conservation program, including work simplification techniques and assistive and adaptive devices. Suggestions for adaptations to a person's environment included using stools during activities, temporarily adapting the home, reorganizing, and using adaptive and assistive devices (Bharati & Sahu, 2022). However, these adaptations to a person's environment must be client-centered (Bharati & Sahu, 2022).

Adaptation to the environment was also addressed by Ciortea (2021), who suggested the importance of environmental adaptation under the guidance of an occupational therapist who adapts the person's home and professional environment to meet a person's needs and functional abilities. Limitations of services include a lack of transferability of energy conservation programs to a population, as the program needs to be tailored to a person's specific needs (Bharati & Sahu, 2022). Specific requirements for individualization of the program indicated the need to remain client-centered and consider potential barriers, including the availability of products and financial barriers (Bharati & Sahu, 2022).

The information found in this CAT paper can be applied across multiple interdisciplinary teams, although the approaches of each team may look different. This information may apply to other professionals, including physical therapists, occupational medicine practitioners, physicians, mental health practitioners, cardiologists, respiratory therapists, cardiac rehabilitation specialists, and others.

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