Cadernos Brasileiros de Terapia Ocupacional
Brazilian Journal of Occupational Therapy

ISSN 2526-8910

Experience Report

Cognitive strategies and metacognition in occupational therapy for a long COVID-19 patient: a single case report

Estratégias cognitivas e metacognição em terapia ocupacional para um paciente com COVID-19 longa: estudo de caso

Sancler Andrade[a,b]

[a]Columbia University, New York, NY, United States.
[b]HCA Medical City Dallas, Dallas, TX, United States.

How to cite: Andrade, S. (2023). Cognitive strategies and metacognition in occupational therapy for a long COVID-19 patient: a single case report. *Cadernos Brasileiros de Terapia Ocupacional*, *31*, e3464. https://doi.org/10.1590/2526-8910.ctoRE265434642

Abstract

Introduction: The impact of COVID-19 on occupational and cognitive functioning deserves further exploration since clinicians have observed long COVID and neurological manifestations of COVID-19 long after the remission of respiratory symptoms. Patients with long COVID represent an underexplored population in need of quality occupational therapy interventions. **Objectives:** (a) present an experience report on occupational therapy for assessment and intervention with this population in a hospital setting; (b) demonstrate how perceived occupational performance and health behavior can be improved by the adoption of cognitive strategies and strategies for changing habits. **Method:** This was a single-case study of a long COVID patient in a hospital setting. A description of the framework for assessment and treatment is provided. The patient received a total of nine sessions focused on the use of cognitive strategies and metacognition. The data were analyzed descriptively. **Results:** After exploring guided interventions, the client could create new habits and routines and have perceived occupational performance. **Conclusion:** This experience report presents a framework for assessing and intervening in long COVID that highlights neurocognition. Prospective studies should evaluate if the effects of the proposed awareness assessment and treatment guidelines are reproducible in other settings and if this approach could be helpful for other COVID-19 survivors.
Keywords: COVID-19, Occupational Therapy, Cognitive Function, Metacognition, Case Report.

Resumo

Introdução: O impacto da COVID-19 no desempenho ocupacional e funcionamento cognitivo merece ser mais explorado porque se observam manifestações neurológicas da

Received on Nov. 22, 2022; 1st Revision on Dec. 16, 2022; 2nd Revision on Feb. 8, 2023; Accepted on Feb. 28, 2023.

COVID-19, mesmo após a remissão dos sintomas respiratórios. Os pacientes com COVID longa representam uma população pouco explorada e que necessita de intervenções de terapia ocupacional de qualidade. **Objetivos:** (a) apresentar um relato de caso em terapia ocupacional com avaliação e intervenção com um paciente com COVID longa em hospital; (b) demonstrar como o desempenho ocupacional e bem estar podem ser melhorados com a adoção de estratégias cognitivas e estratégias de formação de hábitos de saúde **Método:** Estudo de caso único com um paciente com COVID longa em hospital de reabilitação. Descrição de um modelo para avaliação e intervenção. O paciente recebeu um total de nove sessões com foque no uso de estratégias cognitivas e metacognição. Os dados foram analisados de forma descritiva. **Resultados:** Após as intervenções o cliente foi capaz de criar novos hábitos e rotinas e ter uma percepção de melhora sobre o seu desempenho ocupacional. **Conclusão:** Este relato de experiência apresenta um modelo para avaliar e intervir com pessoas com COVID longa, com destaque para a neurocognição. Estudos prospectivos devem verificar se a avaliação de terapia ocupacional e os efeitos das diretrizes de tratamento são reproduzíveis em outros ambientes e se esta abordagem poderia ser útil para outros sobreviventes de COVID-19.

Palavras-chave: COVID-19, Terapia Ocupacional, Função Cognitiva, Metacognição, Estudo de Caso.

Introduction

Long COVID comprises multisystem syndromes, which require a multifaceted approach to manage the physical, cognitive, psychological, social, and vocational effects (Halpin et al., 2021). It affects COVID-19 survivors, from those with very mild acute disease to the most severe forms (Crook et al., 2021). The condition is a public health concern. In a longitudinal study in Brazil that included 646 COVID-positive patients, 50.2% presented with long COVID syndrome (Miranda et al., 2022). In the United States, one in five adults who had COVID-19 reported having long COVID (Centers for Disease Control and Prevention, 2022). The most common symptoms of long COVID are fatigue and difficulty breathing, which last for months after acute COVID- 19. Other persistent symptoms include cognitive and mental impairments, muscle pain, headaches, and gastrointestinal and cardiac issues (Yong, 2021). A substantial number of people need support in finding their way back to meaningful and productive work after COVID-19 (Asaba et al., 2022). Thus, it is essential to better understand the impact of long COVID on occupational participation and performance.

Occupational therapy plays a crucial role in promoting an individual's participation in occupations of choice. Further, it can improve the person's occupational satisfaction. Occupational therapists can assess this population's occupational performance and understand the dynamic relationships between their clients, their contexts, and their occupations (American Occupational Therapy Association, 2020). Interventions can be designed to support engagement in healthy activities, analyze the cognitive functions necessary for successfully managing one's health condition, and modify routines and lifestyles (Toglia, 2018).

This paper presents the case of an individual with long COVID who experienced performance challenges in his daily self-care tasks and had poor lifestyle health behaviors.

We used a structured metacognitive framework, the Multicontext (MC) approach (Toglia & Foster, 2021), that focus on activities that are challenging and generate methods to stay a step ahead. This intervention framework was described first on the Dynamic Interactional Model of Occupational Therapy (Toglia, 1992) and emphasizes that cognition is a continuous product of the dynamic interaction between the individual, task, and environment. Accordingly, the method used in this case study was designed to help a person reflect on their performance by assessing individual strengths and impairments, provide interventions and mediation techniques that support change habits, and improve perceived occupational performance and autonomy.

Method

A case study methodology was used. A case study has a long tradition in clinical practice and research. It aims to provide insight into aspects of a clinical case, and in doing so, illustrate broader lessons that may be learnt (Crowe et al., 2011). In occupational therapy practice, case studies have a role of facilitating practitioners decision-making in choosing assessments and interventions that are unique to the recipient of rehabilitation services (Trickey-Rokenbrod, 2017). Case studies are particularly useful for developing clinical reasoning skills and investigate a phenomena within its real-life context (Yin, 2003).

The framework for assessment and intervention utilized in this case was the MC approach (Toglia & Foster, 2021). This clinical reasoning approach aims to help a person use cognitive strategies across activities to manage performance errors. It asks occupational therapists to move away from traditional direct instructions and toward guided learning methods (Toglia & Foster, 2021). The key ingredients of the MC approach are focus on strategy use, therapeutic support, and the provision of the activities that provide that the just right (optimal level) of challenge. The therapist facilitates the patient's thinking and reflection and is not over focused on the task at hand.

Ethics considerations

Every effort has been made to protect the patient's identity under the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and in compliance with the HIPAA Privacy Rule in the United States (United States Department of Health and Human Services, 2016). All identifiable data has been omitted, and verbal consent was obtained for the study.

Case presentation

J.R., a 63-year-old male, was admitted to an acute care hospital in Dallas, Texas with generalized weakness, shortness of breath, hypotension, and hyperglycemia. J.R. had mild COVID approximately two months before admission. He had failed to return to his primary physician to wean off the medications since he was "not feeling well enough" to leave the house. After ten days in the acute hospital, his respiratory symptoms had stabilized, but he continued to experience extreme fatigue, muscle aches, headaches, and an inability to concentrate. He was then discharged from the step-down unit and

transferred to the inpatient rehabilitation unit (IRU) of the hospital. He received an intensive rehabilitation program with three hours of therapy daily, including on weekends. The admitting physician at the IRU highlighted post-COVID conditions as the primary diagnosis for treatment. J.R. received occupational and physical therapy every day for nine consecutive days. He was followed by multiple physicians in the hospital. He was ultimately discharged home after almost three weeks of total hospitalization.

Occupational therapy process

In the study, the setting of interventions was an Inpatient Rehabilitation unit in a large hospital system in Dallas, Texas. The patient received nine occupational therapy sessions daily with 90 minutes of duration each session. The assessment tools used were: the Activity Measure for Post-Acute Care (Haley et al., 2004), interview for goals setting, and clinical observation of patient doing basic self-care – grooming, bathing, and dressing tasks. No adaptative equipment was used. The patient identified two goals to work with the occupational therapist during the assessment: "I want to be less clumsy." and "I want to lose weight and be healthy.". The occupational therapist used goal-directed interventions focusing on the facilitation of the patient's reflexive thinking, enabling of patient's awareness of the current and future situation, implementation of cognitive strategies during participation in activities of daily living and instrumental activities of daily living, easing habits creation and tracking of new habits; provision of the "just-right challenge," and engaging in the supportive therapist-client relationship. The outcomes of the occupational therapy sessions were attainable and measurable: improved self-care performance, enhanced awareness of perceived occupational performance, and implemented new health and wellness habits. Finally, for discharge recommendations, the occupational therapist suggested a habit-tracking log and continuous use of cognitive strategies in all areas where occupational performance was challenging.

Occupational profile

An occupational profile summarizes a client's occupational history and experiences, daily living patterns, interests, values, needs, and relevant contexts (American Occupational Therapy Association, 2020). The occupational therapist gathered this information throughout the process via a trusting and supportive therapist-client relationship. J.R. was divorced, had a corporate job, had no children, and lived alone. His hobbies were dining out, watching television, and playing with his computer. The occupational therapist inquired about his activities at home since his COVID diagnosis, and he responded,

> *Since my positive COVID test, I have been secluded at home, but, luckily, I have a lot of friends that leave food at my door. I am not able to do much at all. I am barely working, and I have a hard time focusing* [on] *doing things. I got the new Obama book to distract me, but I can't* [get past] *page 2. I am a mess*.

He also reported feeling clumsy at home and needing to "slow down." He could perform all his self-care tasks at home, mainly in the mornings, and had some adaptive equipment in the bathroom, such as bars on the walls, which had been installed recently.

Assessment

In his evaluation, J.R. said, "*It takes me a really long time to do things, and I am terrible at doing even easy, simple things*." He was far from his baseline before contracting COVID. Upon clinical observation, the occupational therapist noted that J.R. was able to move around with poor dynamic standing balance but was capable of performing most basic daily-life tasks, such as toileting, bathing, and dressing, with minimum physical assistance.

The occupational therapist noted that J.R. had poor awareness of his surroundings and needed cues to initiate, continue, and complete basic self-care routines safely. While performing self-care tasks, he would ask the therapist, "*What do I do now?*" He would get easily distracted and, with a good sense of humor, explained to the therapist, "I *am a bull in a China shop*." Table 1 depicts the synthesis of the assessment findings.

Table 1. Synthesis of assessment findings.

Tool#1: Activity Measure for Post-Acute Care (AM-PAC)*	Level of Assistance Needed by J.R.	Raw Score (6-24)**
Bathing (including washing, rinsing, and drying the body)	A little	3
Putting on and taking off regular lower body clothing	A lot	2
Putting on and taking off regular upper body clothing	A little	3
Toileting	A little	3
Personal grooming, such as brushing teeth	A little	3
Eating meals	No assistance	4 Total =18/24

*AM-PAC is the Activity Measure for Post-Acute Care (Haley et al., 2004). **The Raw Score for AM-PAC Activities of Daily Living (ADLs) is a scale from (6-24), the higher is the AM-PA (ADLs) the less assistance is needed by the participant to perform the task.

Clinical observation of his participation in self-care tasks confirmed his statements, and he had clear difficulties paying attention or attending to the task at hand. In terms of his strengths, J.R. had a pleasant disposition and wanted to get better and make healthier choices. He stated, "*My goal is to be healthy, lose some weight, and be less clumsy. I need to take care of* [myself] *better*." The occupational therapist established a plan of care with J.R. It was decided that occupational therapy sessions would be 90 minutes per day until discharge. Table 2 shows J.R.'s goals, the occupational therapy goals, and some selected interventions in his sessions.

Table 2. Synthesis of goals and interventions.

J.R.'s goals	Occupational Therapy goal	Interventions used
"I want to be less clumsy."	The client will improve perceived occupational performance, evidenced by anticipating errors in the performance and using strategies for successful performance 100% of the time.	Verbal rehearsal of tasks, mental imagery, and verbal feedback on performance to identify strategies, barriers, and facilitators of implementation.
"I want to lose weight and be healthy."	The client will be able to record most of his current health habits, identify strategies for creating new habits in anticipation of discharge from the hospital, and track small attainable health habits daily.	Use a diary, develop new habits, re-think the home environment, and rely on small and attainable goals to form health habits.

Results

Goal number one was: "I want to be less clumsy"

The first goal identified by J.R.—"becoming less clumsy"—was related to his occupational skills. He had shown some motivation for change, especially after being hospitalized for a couple of weeks and feeling that he had survived what he recalled as the worst time in his life. J.R. progressively identified hindrances to his performance more quickly and used cognitive strategies to think about his environment at home. At the end of his third session, J.R. reported, "*It looks like it helps to talk to myself before doing something*." J.R.'s self-care performance throughout the IRU stay also improved, and, more importantly, he was able to distinguish the role of his "foggy brain" while performing self-care tasks. At the end of his stay in the hospital, he said, "*I have to psych myself before doing things, but I can do it*." He developed strategies to self-monitor his participation in self-care tasks and was relieved to know that he could control the situation before it became too chaotic for safe participation. Table 3 shows the progression of the cognitive strategies used over time.

Table 3. The number of strategies used during morning activities of daily living over time.

Strategy: verbal mediation	**Number of times used in sessions**
Day 1	0
Day 3	1
Day 5	5
Day 9	6
Strategy: mental rehearsal	**Number of times used in sessions**
Day 1	0
Day 3	1
Day 5	1
Day 9	1

Adopting strategies was not easy or automatic; however, by repeating the same strategies, J.R. became much more aware of his performance. When he saw the benefits, his functional abilities improved. Table 4 shows his functional performance in self-care tasks at discharge.

Table 4. Synthesis of re-assessment findings.

Tool#1: Activity Measure for Post-Acute Care (AM-PAC)*	**Level of Assistance Needed by J.R.**	**Raw Score (6-24)****
Bathing (including washing, rinsing, and drying the body)	No assistance	4
Putting on and taking off regular lower body clothing	No assistance	4
Putting on and taking off regular upper body clothing	No assistance	4
Toileting	No assistance	4
Personal grooming, such as brushing teeth	No assistance	4
Eating meals	No assistance	4 Total =24/24

*AM-PAC is the Activity Measure for Post-Acute Care (Haley et al., 2004). **The Raw Score for AM-PAC Activities of Daily Living (ADLs) is a scale from (6-24), the higher is the AM-PA (ADLs) the less assistance is needed by the participant to perform the task.

Goal number two: "I want to lose weight and be healthy"

In the hospital setting, there are controlled choices of food items on the menu depending on the patient's diet; therefore, J.R.'s usual diet was disrupted. He had to be

weighed every day to manage his kidney disease, which also contributed to his better eating habits in the hospital. J.R. was very self-conscious about how he looked while walking in the hallways of the IRU and would say things such as, "Everybody is looking at me. I feel so fat". As a consequence of his self-perception, J.R. readily adopted the strategy of writing his intentions on a paper and was very specific about them.

His first intention read, "Instead of eating pie or cake, I will eat a piece of fruit after dinner at home". Later in his treatment plan, he started to set intentions for his day at the IRU, such as "I will drink my whole bottle of water by 3 PM; if that doesn't happen, I won't lay down until I do it". J.R.'s intentions were measurable, attainable, and realistic. J.R. also tracked his habits. Table 5 exemplifies how J.R. used this strategy.

Table 5. Habits tracked by J.R. in a week*.

Habit	Mon	Tue	Wed	Thu	Fr	Sat	Sun
Eat fruit	Yes	Yes	No	Yes		Yes	
Drink more water	No	Yes		Yes			
Do physical therapy	Yes	Yes	Yes	Yes	Yes		

*The occupational therapist noted some inconsistencies in how J.R. tracked his habits. In the example above, he missed recording habit outcomes on Wednesday, Friday, Saturday, and Sunday.

J.R. recognized that his two primary triggers of overeating were boredom at home and "working after dark". He identified his triggers and wrote the following in his new diary: "*When it gets dark, it is time to stop. I will either have to leave* [the] *house for a walk with my dog or I will prepare a nice meal for myself. I have to stop before it happens*".

While it is hard to know whether J.R.'s strategies will be carried over to his daily life out of the hospital, J.R. had a newfound confidence that he was on the right track and enthused, "*I am already losing weight!*"

Discussion

In this study, the dynamic interactional model (DIM) of cognition (Toglia et al., 2012) and the multicontext approach were used as a framework to align goal-directed actions with behaviors aimed at changing occupational performance. For example, the therapist would provide facilitatory prompts for J.R. to answer, such as "*Take a moment to observe your bathroom and dressing area. Is there anything you may need to complete this task safely?*".

Occupational therapists work with patients to understand if an individual's skill performance is good enough for independent living or if it will need to be adapted upon the patient's discharge from the hospital. In J.R.'s occupational therapy sessions, it was essential to address how to improve his awareness during the execution of self-care tasks since that would enable him to pay close attention when doing things and develop cognitive strategies for improved satisfaction and performance.

Awareness is a construct consisting of two major components: (a) metacognitive knowledge, which exists before a task or situation, and (b) online awareness, which is specific to the task and includes the ability to recognize task demands and anticipate the likelihood of errors (Toglia & Kirk, 2000). Self-care tasks are marked by a constant flow of online awareness and metacognitive knowledge that dynamically interact with and

depend on the task's characteristics, the person's value of and familiarity with the task, and the environment in which it is performed.

Cognitive strategies are essential for independent living and enable the person to initiate, continue, and terminate a task. J.R. had to recognize contextual hindrances and facilitators of self-care performance and identify how he could perform daily tasks more efficiently.

The occupational therapist documented J.R.'s use of cognitive strategies. These strategies helped J.R. to formulate a mental plan to learn, solve a problem, and perform better. "Mind tools," such as mental imagery and verbal mediation, help an individual break a task into more manageable subtasks, prioritize information, and decide where to start (Toglia et al., 2012). The occupational therapist guided J.R. to organize clutter, rearrange task materials, and self-check his performance by using verbal cues and providing constructive feedback on his performance.

Verbal mediation, understood as "thinking out loud before doing," and mental rehearsing were used. J.R. (Toglia, 2018). J.R. had to imagine himself performing the task smoothly and solving common obstacles before performing the task. The repetition of the same strategies during participation in self-care tasks was encouraged. An occupational therapist constantly remains in touch with the process of doing and provides interventions that match the behavioral change stage the patient is in (Prochaska & Velicer, 1997).

The adoption of new habits requires the disruption of existing ones and the development of new ones. Regardless of whether habits operate during the initiation or performance of behaviors, there is a consensus among researchers that habits develop and change through repeated experiences in particular contexts (Fritz & Cutchin, 2016).

The occupational therapist explored two approaches with J.R. that researchers have found to be effective for modifying habits. The first approach, implementation intentions, refers to action plans stipulating where, when, and how one will engage in the intended behavior (Fritz & Cutchin, 2016). J.R. had to write down his intentions and be very specific. The more straightforward the process of writing intentions, the better and more committed someone will be to using this strategy (Fritz & Cutchin, 2016). The second approach, context modifications, entails identifying and altering contextual cues for action. The hypothesis is that if someone has the conducive environment to perform a new habit, the likelihood of adopting the new habit increases (Fritz & Cutchin, 2016). The disruption of old habits occurs when the situation changes and creates opportunities to modify habits.

A purposeful context change requires the identification of what needs to be changed, and that was not an easy task for J.R. in the hospital environment. Interventions that could improve executive functioning, such as managing inhibitory control and enhancing self-regulation, were added to J.R.'s treatment. The occupational therapist analyzed routines with J.R. and helped to find ways to minimize triggers of unhealthy behaviors.

This experience with J.R. aimed at improving occupational performance and health behaviors in a long COVID patient. The results of this experience demonstrated that, at the individual level, the occupational therapist could use occupation- and cognitive-based interventions to foster increased engagement in living skills. Through occupation-based practice, our profession can significantly affect "[...] long-lasting physical, emotional, health and socioeconomic stressors associated with the COVID-19 pandemic" (Hall et al., 2020). Congruent to the study of Blom et al. (2021), the participant of this

study had a lifestyle that was negatively affected by the pandemic. His health habits were improved by adopting self-regulation techniques and self-monitoring skills. His perceived performance in daily tasks was also enhanced using cognitive strategies, as shown in previous studies (Arora et al., 2021; Nott & Chapparo, 2020; Toglia et al., 2012).

Conclusion

This study aimed to understand how to improve occupational performance and develop healthy habits supporting successful engagement in meaningful and productive work in the setting of long COVID. This experience report sheds light on occupational therapy clinical assessments and interventions in the constricted hospital context and demonstrate how cognitive training aligned with the purposeful use of occupations can produce meaningful results. Overall, the occupational therapy process used in the intense inpatient rehabilitation setting achieved measurable results and positive outcomes for this client with long COVID.

Prospective studies should evaluate if the treatment effect is reproducible and whether this approach could be helpful for other groups of patients in inpatient and outpatient settings.

Acknowledgements

The author would like to thank Dr. Katherine Dimitropoulou, from Columbia University, Programs in Occupational Therapy, for providing expert guidance and review of drafts in preparing this manuscript.

References

American Occupational Therapy Association – AOTA. (2020). Occupational therapy practice framework: domain and process: fourth edition. *The American Journal of Occupational Therapy*, *74*(Suppl. 12), 1-87.

Arora, C., Frantz, C., & Toglia, J. (2021). Awareness of performance on a functional cognitive performance-based assessment across the adult lifespan. *Frontiers in Psychology*, *12*, 753016.

Asaba, E., Farias, L., & Åkesson, E. (2022). Return to work after COVID-19: experiences and expectations from the first wave of COVID-19 in Stockholm. *PLoS One*, *17*(12), e0279000.

Blom, V., Lönn, A., Ekblom, B., Kallings, L. V., Väisänen, D., Hemmingsson, E., Andersson, G., Wallin, P., Stenling, A., Ekblom, Ö., Lindwall, M., Salier Eriksson, J., Holmlund, T., & Ekblom-Bak, E. (2021). Lifestyle habits and mental health in light of the two COVID-19 pandemic waves in Sweden, 2020. *International Journal of Environmental Research and Public Health*, *18*(6), 1-19.

Centers for Disease Control and Prevention – CDC. (2022). *Nearly one in five American adults who have had COVID-19 still have "long COVID".* Retrieved in 2022, November 22, from in https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2022/20220622.htm

Crook, H., Raza, S., Nowell, J., Young, M., & Edison, P. (2021). Long covid-mechanisms, risk factors, and management. *BMJ*, *374*(1648), 1-18.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC*, *11*(100), 1-9.

Fritz, H., & Cutchin, M. P. (2016). Integrating the science of habit: opportunities for occupational therapy. *OTJR*, *36*(2), 92-98.

Hall, D. L., Millstein, R. A., Luberto, C. M., Perez, G. K., & Park, E. R. (2020). Responding to COVID-19 stress: disseminating mind-body resiliency approaches. *Global Advances in Health and Medicine: Improving Healthcare Outcomes Worldwide*, *9*, 1-4.

Haley, S. M., Coster, W. J., Andres, P. L., Ludlow, L. H., Ni, P., Bond, T. L., Sinclair, S. J., & Jette, A. M. (2004). Activity outcome measurement for postacute care. *Medical Care*, *42*(Suppl. 1), 49-61.

Halpin, S., O'Connor, R., & Sivan, M. (2021). Long COVID and chronic COVID syndromes. *Journal of Medical Virology*, *93*(3), 1242-1243.

Miranda, D. A. P., Gomes, S. V. C., Filgueiras, P. S., Corsini, C. A., Almeida, N. B. F., Silva, R. A., Medeiros, M. I. V. A. R. C., Vilela, R. V. R., Fernandes, G. R., & Grenfell, R. F. Q. (2022). Long COVID-19 syndrome: a 14-months longitudinal study during the two first epidemic peaks in Southeast Brazil. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, *116*(11), 1007-1014.

Nott, M. T., & Chapparo, C. (2020). Cognitive strategy use in adults with acquired brain injury. *Brain Injury: [BI]*, *34*(4), 508-514.

Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion*, *12*(1), 38-48.

Toglia, J. (1992). A dynamic interactional approach to cognitive rehabilitation. In N. Katz (Ed.), *Cognitive rehabilitation: models for intervention in occupational therapy* (pp. 104-143). Massachusetts: Andover Medical Publishing.

Toglia, J. (2018). The dynamic interactional model and the multicontext approach. In N. Katz & J. Toglia (Eds.), *Cognition, occupation and participation across lifespan: neuroscience, neurorehabilitation and models of intervention in occupational therapy* (pp. 355-386). Bethesda: AOTA Press.

Toglia, J., & Foster, E. (2021). *The multicontext approach to cognitive rehabilitation: a metacognitive strategy intervention to optimize functional cognition*. Columbus: Gatekeeper Press.

Toglia, J., & Kirk, U. (2000). Understanding awareness deficits following brain injury. *NeuroRehabilitation*, *15*(1), 57-70.

Toglia, J. P., Rodger, S., & Polatajko, H. J. (2012). Anatomy of cognitive strategies: a therapist's primer for enabling occupational performance. *Canadian Journal of Occupational Therapy*, *79*(4), 225-236.

Trickey-Rokenbrod, D. (2017). *Occupational therapy in action: a library of case studies*. Alphen aan den Rijn: Wolters Kluwer.

United States Department of Health and Human Services. (2016). *Health insurance portability and accountability act of 1996.* Retrieved in 2022, November 22, from in https://aspe.hhs.gov/reports/health-insurance-portability-accountability-act-1996

Yin, R. K. (2003). *Case study research: design and methods*. Thousand Oaks: SAGE Publications.

Yong, S. J. (2021). Long COVID or post-COVID-19 syndrome: putative pathophysiology, risk factors, and treatments. *Infectious Diseases*, *53*(10), 737-754.

Corresponding author
Sancler Andrade
e-mail: sanclerandrade@yahoo.com;
sa3903@cumc.columbia.edu

Section editor
Prof. Dr. Daniel Cezar da Cruz