

Participants With Acquired Brain Injury Realized They “Could Still Do Things” After a Yoga Intervention: A Qualitative Descriptive Study

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Importance: Occupational therapy practitioners use yoga in practice to achieve holistic care, and the American Occupational Therapy Association has provided guidance on the use of yoga in occupational therapy. For people with acquired brain injury (ABI), however, it is unknown whether yoga affects occupational performance.

Objective: To explore the perceived impact of an adapted yoga intervention on occupational performance using the *Occupational Therapy Practice Framework: Domain and Process (4th ed.; OTPF-4)* for participants with ABI.

Design: Qualitative descriptive study using virtual, semistructured interviews. An inductive, holistic, open-coding process, followed by a deductive process to map open codes to the *OTPF-4*.

Participants: Nine individuals with ABI were recruited from a yoga intervention study.

Results: The theme generated from the data—“Yoga participants with ABI realized that they could still do quite a bit”—was supported by two major categories from the *OTPF-4*: Occupations and Performance Skills. Participants described improvements in their functional performance (i.e., motor skills, process skills) and how these factors were synergistically connected to their occupational performance (i.e., self-care, leisure).

Conclusions and Relevance: This study provides novel insight into how functional performance improved so participants could “still do things,” such as engaging in occupations. When participants described improved performance skills, they simultaneously described re-engagement with their meaningful occupations. Participants also perceived an improvement in their mind–body connection, which should be further explored in future studies. This study generated original findings about participants’ perceptions of an adapted yoga intervention as they relate to the *OTPF-4*.

Plain-Language Summary: This study reports individuals’ perceptions of their re-engagement with occupations and changes in occupational performance skills after participating in an adaptive yoga intervention. We highlight the distinct contribution that adaptive yoga—an intervention modality that can be used by occupational therapy practitioners—may have, using the *OTPF-4* to connect the participants’ perceptions about their improvements in occupational performance.

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Acquired brain injuries (ABI) are common and include traumatic brain injuries and nontraumatic injuries such as strokes, brain infections, and tumors. ABIs may result in functional deficits, such as negative changes in physical, emotional, and cognitive abilities. Collectively, such deficits may decrease the ability to engage in occupations. Yoga, a holistic intervention,

appears both feasible and beneficial after brain injury (Donnelly et al., 2017; Garrett et al., 2011; Schmid et al., 2016; Stephens et al., 2020). Yoga after brain injury is associated with improvements in multiple client factors such as balance (Green et al., 2019; Roney et al., 2018; Stephens et al., 2020), strength (Schmid et al., 2014, 2016), range of motion (Garrett et al.,

2011; Schmid et al., 2014; Stephens et al., 2020; Zou et al., 2018), executive function (Wen et al., 2022), and emotional regulation (Donnelly et al., 2017, 2020; Roney et al., 2018; Seenev & Griffin, 2020). Although these client factors improve with yoga, it is unknown whether improvements in these factors co-occur with changes in occupational performance.

To the best of our knowledge, no research has linked the *Occupational Therapy Practice Framework: Domain and Process* (4th ed.; *OTPF-4*; American Occupational Therapy Association [AOTA], 2020) to yoga outcomes. The *OTPF-4* provides occupational therapy practitioners with language to describe the value and impact of occupational therapy services on our clients' occupational performance. Occupational therapy practitioners use yoga in practice and the AOTA has provided guidance on the use of yoga in occupational therapy (AOTA, 2023). Therefore, it is important for occupational therapy practitioners who incorporate yoga into their practice to understand the potential improvements their clients may experience and to have language with which to articulate these improvements. The purpose of this study was to explore the perceived impact of yoga on participants' occupational performance through the lens of the *OTPF-4*.

Method

Design

We conducted a descriptive qualitative study (Colorafi & Evans, 2016) at the end of a single-arm adaptive yoga intervention for people with ABI (Stephens, 2021). We selected a qualitative descriptive methodology, because it enabled a naturalistic inquiry approach to answer the research question "To what extent did research participants from a group adaptive yoga intervention perceive the impact of yoga in their daily life?" This study enabled us to better understand how participants perceived the impact of yoga. We included descriptive methods, such as purposive sampling and the use of theoretical frameworks, to inform our data collection and analytic procedures (Colorafi & Evans, 2016).

We followed the Standards for Reporting Qualitative Research (O'Brien et al., 2014) and the Consolidated Criteria for Reporting Qualitative Research (COREQ), because our methods included interviews (Tong et al., 2007). By adhering to reporting standards, we ensured rigor and adequacy of the research design.

Recruitment and Participants

To optimize safety during group adaptive yoga classes, we enrolled 12 participants. Participant inclusion criteria for the intervention study were a chronic ABI for more than 6 mo before the study and self-reported balance limitations. Those who participated in non-adaptive yoga post-ABI were excluded. Nine of the

12 participants completed the postintervention assessment phase.

We used purposive sampling, a key feature of descriptive studies, which means that we recruited participants from the postintervention assessment phase of the adapted yoga intervention study (Colorafi & Evans, 2016). Nine people agreed to participate in a semistructured interview. Although 9 participants is not a large sample, we feel that these 9 participants gave us insight to link participants' re-engagement and/or change in occupational engagement postyoga to the *OTPF-4* (Colorafi & Evans, 2016; Kim et al., 2017).

Participants received a yoga mat and nominal financial incentives. All participants provided written informed consent. The Colorado State University Institutional Review Board approved all study procedures.

Intervention

The 60-min adapted yoga intervention was conducted once a week for 8 wk at a local, university-affiliated health center. It was led by an adaptive yoga specialist with a 500-hr certified yoga teacher certification and 20 yr of experience providing adaptive yoga. Our study used hatha yoga, because it is adaptable and focuses on the mind-body connection through modifications and connected breath and movement (Iyengar, 1968). Yoga sessions included warmups, movements to increase blood circulation to limbs, postures paired with breath, and postures in a progressively challenging sequence. The postures included sitting, standing, and floor positions to improve independence with the yoga flow and balance, eye movements, production of vowel sounds, mindful swallowing, and a savasana (rest). Additional details on the group yoga activities are detailed by Stephens et al. (2020).

Data Collection

We collected participant demographic information using a questionnaire during baseline assessment of the intervention study. We developed a semistructured interview guide because it supported flexibility in the conversation and prompted clarification of the participants' responses (Creswell & Poth, 2018). We used a framework, the *International Classification of Functioning, Disability and Health (ICF)*, to inform the development of the semistructured interview guide, a key feature of descriptive studies (Colorafi & Evans, 2016; World Health Organization, 2013). Therefore, interview questions focused on changes in their daily experiences as well as physical and psychological changes that the participants experienced. To consider how an adapted yoga intervention might be tailored for future studies or uptake in the community. We also asked participants about their perceptions of group yoga and their recommendations for future adaptive yoga interventions. Interviews enabled us to understand the participants' lived experiences and

their meaning associated with any changes they noticed (Creswell & Poth, 2018). We conducted semistructured interviews one-on-one through videoconferencing. A research assistant who is trained in qualitative methods (Abby K. Richard) conducted the interviews. Interviews were an average of 41 min and were audio recorded and transcribed verbatim through Rev (www.rev.com).

Data Analysis

The transcripts of the interviews were managed and analyzed using NVivo software. First, we used a holistic, thematic open coding approach (Richard, Jennifer A. Weaver), using the following four steps: familiarization of data by reading the transcripts multiple times, generation of initial inductive codes, identification of a theme looking at the data holistically, and revising the theme (Braun & Clarke, 2006; Saldana, 2016). We used in vivo open coding and inductive categories so that we were grounded in the data (Colorafi & Evans, 2016; Saldana, 2016). Codes could become categories, and codes were not mutually exclusive to one category. A theme was generated by combining one or more categories. The trained research assistant (Richard) received support and weekly debriefing from a qualitative expert (Weaver) to develop a codebook that included participants' quotes, open codes, categories, and the preliminary theme(s). Debriefing and peer scrutiny with other research team members (Arlene A. Schmid, Jaclyn A. Stephens, Weaver) allowed us to maximize the credibility of the findings, because we were able to respond to comments and critiques about our earlier work (Creswell & Poth, 2018; Shenton, 2004).

Our team consisted of qualitative researchers with expertise in intervention research (Arlene A. Schmid), qualitative methodology (Weaver, Schmid, Kalpana Gupta) neuroscience (Stephens, Richard, Denny Press), and yoga (Schmid, Richard). We acknowledge our positionality may affect analyses. For example, during a debriefing, two of the initial inductive categories discussed were Daily Activities and Skills and Performance. The coauthors who were trained as occupational therapy practitioners drew connections between the preliminary categories and participants' perceptions of improved occupational engagement to concepts in the *OTPF-4* (AOTA, 2020). We then chose to deductively code to the *OTPF-4*, and not the

ICF, to identify the distinct contribution that adaptive yoga has on promoting participation for people with ABI. Table 1 describes our analytic process with an example of how we mapped the inductive codes and categories to concepts in the *OTPF-4* using a deductive approach (Hsieh & Shannon, 2005).

When reading the nine transcripts, our team wanted to understand whether the adaptive yoga participants noticed changes in their occupations or performance skills. Because of the small sample size, we were not looking for generalizability but rather a description of the depth and breadth of occupations discussed. Therefore, in addition to qualitative data, we also report the number of participants who had at least one quote coded to each subcategory.

Results

Nine participants completed qualitative interviews. Participants ranged from 29 to 74 yr old; additional demographic information can be found in Table 2. We describe one major theme generated from the data: "Yoga participants with acquired brain injury realized they could still do quite a bit." This theme describes how the participants perceived improvements in their client factors and had awareness and insight that they were able to try things. The theme is supported by two major categories in the *OTPF-4*: Occupations and Performance Skills (Figure 1). We report data salient to each category and their respective subcategories.

Two of the 9 participants did not report re-engagement or improved engagement with their occupations. One participant, Cody, qualitatively reported improved balance from the adaptive yoga intervention but did not describe any occupations that improved. Another participant, with a self-reported comorbidity of vertigo, described feeling dizzy after the adaptive yoga. The remaining 7 participants provided descriptions of improvement to their occupational performance, which is further detailed in the following text. Individual quotes are provided with pseudonyms to protect confidentiality and privacy.

Occupations

Occupations was the predominant category that was generated from the data, in light of participants'

Table 1. Description of the Analytic Process

Inductive Approach		Deductive Approach	
In Vivo Open Code	Category	<i>OTPF-4</i> Category	<i>OTPF-4</i> Subcategory
First long hike	Daily Activities	Occupations	Health Management: Physical Activity Leisure
More control to not fall and catch myself	Skills and Performance	Performance Skills	Process Skills: Adapting performance

Note. The transcript text was as follows: "I actually had more control. I was able to go on my first ever longer hike. It was over three miles. My body was able to . . . There was lots of debris and things. The elevation went up. I might roll on a twig or a pine cone or something, like lose balance, but I was able to not fall. I was able to catch myself and be more perceptive of that." *OTPF-4* = *Occupational Therapy Practice Framework: Domain and Process* (4th ed.).

Table 2. Demographic Information

Participant	Age, yr	Gender	Race and Ethnicity	Education	Years Since ABI	Self-Reported Rehabilitation participation
Brenda	74	Female	White	Not reported	13	1 yr
Cody	55	Male	White	Doctorate	2	1.5 yr
Roxanne	29	Female	White	High school	4	2 yr
Tom	56	Male	White	Bachelor's degree	8	Ongoing
Carla	57	Female	White	Some college	20+	Ongoing
Lucia	34	Female	American Indian, Alaska Native and Hispanic-Latino	Some graduate school	3	Ongoing
Brent	37	Male	White	Some college	1	None
Alex	30	Male	White	Some graduate school	13	None
Kelly	40	Female	White	Master's degree	4	1 yr, 9 mo

Note. ABI = acquired brain injury.

sharing their perceptions of regaining or improving perceived abilities after yoga. The five subcategories were (1) Activities of Daily Living (ADLs), (2) Instrumental Activities of Daily Living (IADLs), (3) Health Management, (4) Rest and Sleep, and (5) Leisure.

Activities of Daily Living

The ADLs subcategory includes participants' quotes about routinely taking care of oneself (AOTA, 2020). Participants reported improvement in performing specific ADLs such as eating and swallowing ($n = 1$), functional mobility ($n = 5$) and personal hygiene and grooming ($n = 1$).

Brenda described improvements in the ability to eat and swallow, describing that, after yoga, she was able to "swallow instead of [having] a dry mouth, I was able to get moisture, and my lips would relax." She also described how mindfully swallowing made it "easier to breathe the right breathing pattern," and this helped her to diminish drooling.

Five participants described changes in their *functional mobility*, or ability to move from one position or place to another. Alex described feeling more stable after yoga and that "I don't have to use my arms to get up out of a chair anymore. I can just use the legs like they're supposed to." Brenda described increased strength and using "more of a method to get out [of her recliner] rather than just sliding and standing up." She also explained how she felt "more confident getting up and down in the yard" and was able "to focus or wait for distractions to go by" when, previously, movement in her peripheral vision would cause her to feel stuck. Brenda also mentioned that when she needed to reach something on the bathroom floor, she felt "very confident," and she used mindfulness to "stop, assess, and then go down to reach something on the bathroom floor. . . . I'm usually much more cautious about reaching down for anything." For

Brenda, the improvement in functional mobility supported her ability to complete home management tasks in the bathroom and throughout other areas of her home.

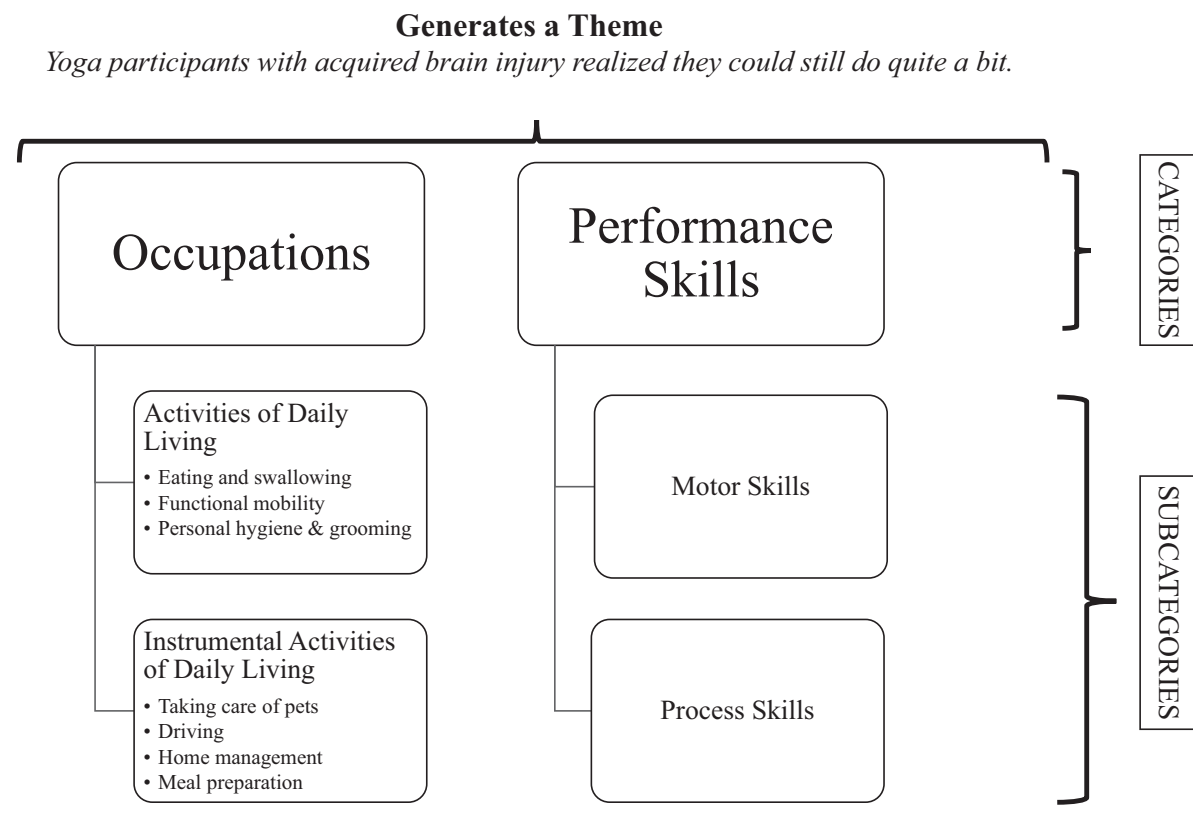
One participant, Brenda, specifically described her personal hygiene and grooming routine and how she felt it improved because she was able to use more complex positions after yoga. Brenda stated that she recently "brushed my hair standing up, which I usually sit down for." These quotes exemplify how the participants simultaneously described improved functional mobility or performance skills (i.e., balance, endurance) and engagement with their occupations, such as personal hygiene and grooming.

Instrumental Activities of Daily Living

The IADLs subcategory included daily life activities that occur around the home and community (AOTA, 2020). In the data, participants described changes in activities, such as taking care of care of pets and animals ($n = 1$), driving and community mobility ($n = 1$), home establishment and management ($n = 2$), and meal preparation ($n = 1$). Participants perceived more confidence and comfort when performing activities that previously seemed challenging, such as walking a dog on a windy day.

Carla described feeling more comfortable taking care of her pet. She described that while "out walking my dog, I felt more comfortable on a blustery day than usual. . . . Before, I could not take my dog for a walk while it was windy." Brenda reported that eye yoga and movements helped with her ability to drive safely: "I use my mirrors a lot when I'm driving, and [eye yoga] reinforces what I should be doing when I'm driving anyway, looking up instead of just moving my eyes." She described previously only moving her eyes while driving but that after yoga, she was able to turn her head and use her peripheral vision to check

Figure 1. Description of categories that support the main theme.



blind spots more effectively. Alex noted improvements with meal preparation and stated, “I cook more and [do] not feel like I have to go out to eat. . . . more self-sustaining.” He described that both of his thumbs sustained injuries and that the stretching and strengthening in yoga led to better mobility in his fingers, which he felt was needed when cooking.

Health Management

The Health Management subcategory includes quotes about the participants’ managing their physical and mental health needs and recognizing fluctuations (AOTA, 2020). Participants showed changes in awareness of and actions around maintaining and improving their health. Specifically, participants described changes related to social and emotional health promotion and maintenance ($n = 4$), symptom and condition management ($n = 4$), and physical activity ($n = 3$).

When participants described social and emotional health promotion and maintenance, they discussed how participating in yoga led them toward a longer term investment in their health and quality of life. Participants identified personal strengths and an increased ability to manage their emotions. Brent described how yoga helped them build an “adaptation response to life to be more copacetic.” Brent recognized that some changes would take more time, and he might not feel “instant gratification [or] instant results.”

Participants described how it was an iterative process to learn what they needed to do to address their symptoms and manage their condition. Tom described fluctuations in his ABI symptoms and abilities and better health management. Tom found that it was optimal to participate in yoga once a week to improve his balance. By participating in yoga once a week, he felt that it enabled him to continue engaging in other occupations, such as meal preparation.

Cooking tacos or something really simple for dinner, if I was mentally worn down, that would be very challenging for me. And as time has gone on, that's gotten better and better for me, but as far as being able to do more and not needing as much recovery time, it's 99% mental based on my injury.

Tom described how he is continuously learning about his condition and recovery process. He stated, “I give myself the grace to take a day off if I need to.” Tom acknowledged that his increased awareness of his fluctuating abilities helps him manage by adjusting his activity level.

Participants noted changes and breakthroughs in their ability to exercise and their levels of physical activity after yoga. Lucia recalled a breakthrough in physical exercise during the study. She described going for her “first ever longer hike” and had experiences before yoga where she would fall, but on that longer hike, she expressed being “able to catch myself and be more perceptive of that [losing balance].” Tom

described a breakthrough that he had during the 8-wk yoga intervention.

[T]he standing poses that I was able to do in the classes are things that I was not able to do at any prior class . . . there was a time I wouldn't have even tried to do a warrior one pose or something. In the class with you all, I think I was doing it without holding on. It's a different kind of pose for me now than it once was.

This quote exemplifies Tom's improvement in his balance during the yoga class, and he went on to explain how he stays active and challenges his balance every day with functional activities.

I try to stay pretty active and those kinds of activities [using the leaf blower, mowing the lawn] challenge my balance every day. The little bit of the benefit that I get from doing things like yoga is just one activity in the course of a week that might contribute to my balance and things possibly continuing to get better over time.

Tom's quote demonstrates the interconnectedness between improved motor and performance skills (i.e., balance) with meaningful IADL home management tasks to support his overall health.

Rest and Sleep

The Rest and Sleep subcategory pertains to participants' perceptions of a change in their rest and also in their sleep (AOTA, 2020). Five of the 9 participants perceived changes in their rest and sleep. Brenda described that yoga helped her give herself permission to take a "stroke nap." She explained, "You don't really need [a nap], but for some reason, you do and something in the brain is tired . . . during that period, if you don't take a nap and try to push through. . . . [It's] a very unstable, stagger-y, dangerous time." Half-way through the study while at home, she described an awareness of a stroke nap coming on for the first time in a while and gave herself permission to sleep to avoid putting herself in danger of falling. Roxanne mentioned that she felt that her "duration and depth" of sleep had improved. Lucia also perceived good changes in the quality of her sleep. She stated, "I feel like my quality of sleep at least the last 2 weeks has been . . . with the consistency of yoga has been pretty good. A bit more mindful with sleeping as well." Lucia attributed her mindfulness to yoga, which she perceived to affect her sleep quality and awareness of needing sleep.

Leisure

The Leisure subcategory reflects activity that includes intrinsically motivated activities that participants choose to do (AOTA, 2020). One participant, Brenda, recounted a breakthrough in the ability to participate in a leisure activity. She described, "I was able to draw for the first time since [the] injury, so [improved] convergence [during] close up work." Brenda felt that she had a recovery of her eye motor skills, which enabled

her to engage in an activity that she thought she had lost the ability to perform.

Performance Skills

Participants' perceived improvements in their skills resulted in their ability to continue engaging in occupations. We started to see this connection earlier under the category Occupations, when participants described their improved functional mobility, which contributed to perceived improvement in ADLs and IADLs. Performance skills are different from functional mobility in that they include motor and process skills that helps the participant engage in effectively completing a task (AOTA, 2020). Some participants perceived that the 8-wk yoga intervention enabled them to focus on skills related to their movement (i.e., motor skills) and their ability to perform desired actions and sequences using objects (i.e., process skills). The *OTPF-4* category of Performance Skills, relates to the overarching theme because "doing" things requires the participants to carry out precisely sequenced movements.

Motor Skills

Three participants described improvements in their motor skills: movements and actions related to moving oneself and objects in precise ways. Participants described being able to position their body in space (i.e., proprioception), obtain and hold objects, move self and objects, and sustain their performance.

Tom described changes in his proprioception early in his recovery process after participating in the yoga intervention. He shared that, in practicing yoga,

I started recovering . . . my sense of where my body is in space and where my arms are in space. Early on postinjury, even after being in a month's worth of inpatient or in hospital recovery where I did physical, occupational, speech. . . . After that, I still didn't have that sense of where I was or if I was going to poke someone in the eye if I reached out or was I going to be six feet away from them. So more than anything, I think initially for me, that's what I got out of yoga. I got back in touch with my body as far as the stretching. It just helped me immensely to figure out how to move around again.

Brenda felt that yoga gave her more awareness of her current motor skills and how her performance changed when she had to move faster.

I think it coordinates my brain with my body, and it makes me focus on what I'm doing. Because like, when my kids come to visit and we go to town, I forget that I can't walk as fast as they do. Then I just start dragging my leg rather than stepping, I'm just trying to keep up. And I think, a few years ago, I was not aware that I did that. And now after the quarantine and everything, I noticed that I get sloppy in the house too and just kind of drag that leg along rather than step. *Yoga makes you become aware of, even if you don't change the way you do things, at least*

you're aware that you are doing them wrong and shouldn't be doing that.

Brenda highlighted how yoga helped her identify and consider her motor skills (e.g., ineffective movement patterns) and that she could not sustain the level of performance needed to keep pace with her children.

Process Skills

Participants expressed increased ability to adapt performance in actions and steps related to processes involved in daily activities (AOTA, 2020). Two participants described improvements in adapting their performance and feeling that they had more control and confidence. Lucia's description of her first long hike after her injury demonstrated the ability to adapt and respond to an environment with uneven ground. She recounted that when "the elevation went up, I might roll on a twig or pine cone . . . lose balance, but I was able to not fall." Brenda had a recollection of a near fall during the study. She perceived improved process and motor skills in managing to quickly adjust her body to stabilize her balance, allowing her to "shift into my gymnastics and stick the landing" with "no big fear or real relief. I just accepted it." Brenda indicated that yoga supported an increase in confidence and bodily awareness alongside her improved performance skills.

Discussion

This study provided novel insight into how functional performance may improve for people with ABI, so that they could "still do things," such as occupations, after participating in a yoga intervention study. Overall, most of the participants felt that the yoga intervention led to improvements in their occupations and functional performance. One participant, who attributed challenges completing the yoga poses to their vertigo, did not describe an improvement from participating in the yoga intervention study. In this article, we describe the connection between the improvement of function (i.e., motor skills, process skills, and/or functional mobility) and the participants' abilities to engage or reengage in occupations. When participants described improved motor and process skills, it was typically nested within the context of a story about a meaningful occupation, such as being able to better manage one's home, go for a longer walk, and take care of their pets. Therefore, it appears that the identified improvement in function noted by the participants was also described as enhancing their occupational performance. Although this finding may not be surprising to occupational therapy practitioners, it is important for the literature to explicate these synergies.

Participants Simultaneously Described Improved Performance Skills and Engaging in Meaningful Occupations

The participants in this study reported realizations of what they could still do regarding motor and process

skills. Our study used the modality of yoga to address performance skills, such as improved balance, and led participants to describe occupations as an end, meaning that other facets of their daily activities improved (Gray, 1998). When we asked participants about improvements in balance or range of motion, they often engaged in the act of storytelling. Stories enable participants to convey the meaning behind improvement in something that might otherwise feel mundane or trivial (Mattingly & Fleming, 1994). During these stories, our participants not only described their improved balance or endurance but also linked these improvements to being able to "still do" something meaningful, such as hiking for a longer duration on uneven ground or being able to stand while getting ready for their day in the morning. Although previous studies have found that people with traumatic brain injury and stroke experienced improved endurance after a yoga intervention (Schmid et al., 2014, 2016), we argue that it is important to contextualize these improvements in how they support meaningful activity, because this highlights the distinct value of occupational therapy.

Yoga Enhanced the Development of a Mind–Body Connection

In addition to improving occupations and functional performance, our findings indicate that participants experienced improvements in a mind–body connection. We operationally define the *mind–body connection* as becoming "more aware of their body physically and sensually, but also more attached to their body emotionally" (Garrett et al., 2011, p. 2411). It is possible that yoga keeps participants in the moment and enhances body awareness (Garrett et al., 2011; Gilchrist et al., 2022; Levack et al., 2010). Participants described an awareness to the needs of their body and mind (e.g., taking a "stroke nap" or adjusting their performance to prevent a fall). Prior work has also noted an increased awareness to one's body after yoga in populations with acute and chronic ABI (Garrett et al., 2011; Roney et al., 2018; Seeney & Griffin, 2020). The participants provided examples in relation to their sleep, motor, and process skills and their ability to engage or re-engage in their occupations.

Supporting Reflective Practice

Occupational therapy practitioners use the *OTPF-4* to articulate the value of occupational therapy with defined terms, domains, and concepts. Our study found that participants naturally described the benefits of yoga as supportive of both functional and occupational performance. Clients—like our participants—might use storytelling to describe specific functional improvements that result from an occupational therapy intervention within the context of performing meaningful occupations. The client's storytelling can enable

the occupational therapy practitioner to use narrative, clinical reasoning and support both the practitioner and the client in reflecting on the functional and occupational performance improvements.

Limitations and Future Directions

This study involves a small sample size, which may be sufficient for qualitative analysis, but the findings are not generalizable. Our small sample supported an effort to understand which occupations changed or improved after participating in adaptive yoga. The small sample size contributes to why some of our subcategories were described by one participant's experiences. Future work should include larger, more diverse participant groups, because this may support occupational therapy practitioners and occupational therapy researchers to articulate the value of adaptive yoga.

Interviews were conducted after the 8-wk yoga intervention instead of throughout the study; therefore, another limitation is recall bias, and future intervention studies should consider adding an interview at the midpoint. Additionally, our interview guide did not use a narrative structure, and narrative interviewing may generate additional stories about improved occupations and functional performance. Finally, our interview guide was not designed to capture all categories within the *OTPF-4*; therefore, it is possible that some of the participants' experiences related to occupation may not have been captured.


Implications for Occupational Therapy Practice

Yoga may elicit positive changes for people with chronic ABI.

- Occupational therapy practitioners who evaluate and treat clients with ABI should consider recommending adaptive yoga as a complementary rehabilitation practice and assess perceived benefits in the context of occupational performance (AOTA, 2023).
- Occupational therapy practitioners who are certified as yoga teachers may consider providing adaptive group yoga classes to facilitate improvement in functional and occupational performance.

Conclusion

Participants recognized that they could “still do quite a bit,” such as engage or re-engage with meaningful occupations, after participating in adaptive yoga. When we asked participants whether they had improved balance from the adaptive yoga, they would tell us about a moment when they realized that now they were able to take a long hike on an unpaved path or complete tasks such as grooming standing up. To our knowledge, this is the first article to link the perceived

improvements from adaptive yoga to the *OTPF-4* supporting occupational therapy researchers and practitioners in articulating the therapeutic benefit of adaptive yoga. 

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References

- American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). *American Journal of Occupational Therapy*, 74(Suppl. 2), 7412410010. <https://doi.org/10.5014/ajot.2020.74S2001>
- American Occupational Therapy Association. (2023). Complementary health approaches and integrative health in occupational therapy. *American Journal of Occupational Therapy*, 77(Suppl. 3), 7713410200. <https://doi.org/10.5014/ajot.2023.77S3001>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Colorafi, K. J., & Evans, B. (2016). Qualitative descriptive methods in health science research. *HERD*, 9, 16–25. <https://doi.org/10.1177/1937586715614171>
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). Sage.
- Donnelly, K. Z., Goldberg, S., & Fournier, D. (2020). A qualitative study of LoveYourBrain Yoga: A group-based yoga with psychoeducation intervention to facilitate community integration for people with traumatic brain injury and their caregivers. *Disability and Rehabilitation*, 42, 2482–2491. <https://doi.org/10.1080/09638288.2018.1563638>
- Donnelly, K. Z., Linnea, K., Grant, D. A., & Lichtenstein, J. (2017). The feasibility and impact of a yoga pilot programme on the quality-of-life of adults with acquired brain injury. *Brain Injury*, 31, 208–214. <https://doi.org/10.1080/02699052.2016.1225988>
- Garrett, R., Immink, M. A., & Hillier, S. (2011). Becoming connected: The lived experience of yoga participation after stroke. *Disability and Rehabilitation*, 33, 2404–2415. <https://doi.org/10.3109/09638288.2011.573058>
- Gilchrist, H., Haynes, A., Oliveira, J. S., Grunseit, A., Sherrington, C., Bauman, A., . . . Tiedemann, A. (2022). The value of mind-body connection in physical activity for older people. *Journal of Aging and Physical Activity*, 31, 81–88. <https://doi.org/10.1123/japa.2021-0503>
- Gray, J. M. (1998). Putting occupation into practice: Occupation as ends, occupation as means. *American Journal of Occupational Therapy*, 52, 354–364. <https://doi.org/10.5014/ajot.52.5.354>
- Green, E., Huynh, A., Broussard, L., Zunker, B., Matthews, J., Hilton, C. L., & Aranha, K. (2019). Systematic review of yoga and balance: Effect on adults with neuromuscular impairment. *American Journal of Occupational Therapy*, 73, 7301205150. <https://doi.org/10.5014/ajot.2019.028944>
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15, 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Iyengar, B. K. S. (1968). *Light on yoga: Yoga dipika* (2nd ed.). Allen & Unwin.
- Kim, H., Sefcik, J. S., & Bradway, C. (2017). Characteristics of qualitative descriptive studies: A systematic review. *Research in Nursing and Health*, 40, 23–42. <https://doi.org/10.1002/nur.21768>

- Levack, W. M., Kayes, N. M., & Fadyl, J. K. (2010). Experience of recovery and outcome following traumatic brain injury: A metasynthesis of qualitative research. *Disability and Rehabilitation*, 32, 986–999. <https://doi.org/10.3109/09638281003775394>
- Mattingly, C., & Fleming, M. H. (1994). *Clinical reasoning: Forms of inquiry in a therapeutic practice*. F. A. Davis.
- O'Brien, B. C., Harris, I. B., Beckman, T. J., Reed, D. A., & Cook, D. A. (2014). Standards for reporting qualitative research: A synthesis of recommendations. *Academic Medicine*, 89, 1245–1251. <https://doi.org/10.1097/ACM.0000000000000388>
- Roney, M. A., Sample, P. L., Stallones, L., Van Puymbroeck, M., & Schmid, A. (2018). The lived experience of individuals with chronic traumatic brain injury: An adapted group yoga intervention. *OBM Integrative and Complementary Medicine*, 3, 33. <https://doi.org/10.21926/obm.icm.1804033>
- Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage.
- Schmid, A. A., Miller, K. K., Van Puymbroeck, M., & DeBaun-Sprague, E. (2014). Yoga leads to multiple physical improvements after stroke, a pilot study. *Complementary Therapies in Medicine*, 22, 994–1000. <https://doi.org/10.1016/j.ctim.2014.09.005>
- Schmid, A. A., Miller, K. K., Van Puymbroeck, M., & Schalk, N. (2016). Feasibility and results of a case study of yoga to improve physical functioning in people with chronic traumatic brain injury. *Disability and Rehabilitation*, 38, 914–920. <https://doi.org/10.3109/09638288.2015.1062927>
- Seeney, R., & Griffin, J. (2020). The lived experience and patient-reported benefits of yoga participation in an inpatient brain injury rehabilitation setting. *International Journal of Yoga*, 13, 25–31. https://doi.org/10.4103/ijoy.IJOY_46_19
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22, 63–75. <https://doi.org/10.3233/EFI-2004-22201>
- Stephens, J. (2021). *Neural markers of static and dynamic balance before and after yoga in adults with brain injury* [ClinicalTrials.gov ID: NCT05895084]. U.S. Clinical Trials Registry. <https://www.clinicaltrials.gov/study/NCT05895084?term=NCT05895084&rank=1>
- Stephens, J. A., Van Puymbroeck, M., Sample, P. L., & Schmid, A. A. (2020). Yoga improves balance, mobility, and perceived occupational performance in adults with chronic brain injury: A preliminary investigation. *Complementary Therapies in Clinical Practice*, 40, 101172. <https://doi.org/10.1016/j.ctcp.2020.101172>
- Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated Criteria for Reporting Qualitative Research (COREQ): A 32-Item Checklist for Interviews and Focus Groups. *International Journal for Quality in Health Care*, 19, 349–357. <https://doi.org/10.1093/intqhc/mzm042>
- Wen, P. S., Herrin, I., & Pittman, A. (2022). Feasibility of yoga to improve symptoms in individuals with severe, chronic traumatic brain injury: A mixed-methods case series. *Alternative Therapies in Health and Medicine*, 28, 32–37.
- World Health Organization. (2013). *How to use the ICF: A practical manual for using the International Classification of Functioning, Disability and Health (ICF)*. <https://www.who.int/publications/m/item/how-to-use-the-icf—a-practical-manual-for-using-the-international-classification-of-functioning-disability-and-health>
- Zou, L., Sasaki, J. E., Zeng, N., Wang, C., & Sun, L. (2018). A systematic review with meta-analysis of mindful exercises on rehabilitative outcomes among poststroke patients. *Archives of Physical Medicine and Rehabilitation*, 99, 2355–2364. <https://doi.org/10.1016/j.apmr.2018.04.010>

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