How Adults With Stroke Conceptualize Physical Activity: An Exploratory Qualitative Study

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Importance: Physical activity (PA) is recommended for improving physical and cardiovascular function but can be challenging because of stroke-related impairments. A better understanding of how adults with stroke conceptualize PA could assist in developing effective interventions for increasing poststroke PA.

Objective: To explore how adults with stroke conceptualize PA.

Design: Phenomenological qualitative design.

Setting: Participants' homes.

Participants: Community-dwelling adults with chronic (>6 mo) stroke (N = 15).

Outcomes and Measures: Semistructured interviews were conducted with participants. Data were analyzed by means of inductive content analysis to identify key themes.

Results: Three key themes emerged: (1) *moderate to vigorous PA,* which includes exercise-related activities (going to the gym, walking, playing sports); (2) *PA necessary for performing daily activities and occupations,* which includes basic and instrumental activities of daily living; and (3) *avoiding sedentary behavior,* which includes not wanting to sit for long periods of time, avoiding boredom, and valuing PA over being sedentary.

Conclusions and Relevance: Participants broadly categorized PA, encompassing multiple activity types, which is encouraging because reducing sedentary behavior and increasing PA of any intensity can improve cardiometabolic health. Interventions that complement and enhance these conceptualizations, alone or in combination with other mechanisms of action, should be explored for their efficacy in increasing PA in adults with stroke.

What This Article Adds: After stroke, perceptions of PA encompass exercise, daily activities and occupations, and avoiding sedentary behavior; these perceptions could be harnessed to promote PA among adults after stroke.

Physical activity (PA) is recommended for adults with stroke to improve physical and cardiovascular function and reduce cardiometabolic risk (Billinger et al., 2014). PA occurs along a continuum, extending from light-intensity PA (1.6–2.9 metabolic equivalent of task [METs]) to moderate- to vigorous-intensity PA (≥3 METs). Sedentary behavior, which is PA related, is characterized by activity of ≤1.5 METs that occurs while awake and in a sitting, reclining, or lying position; it is associated with cardiovascular morbidity and mortality (Tremblay et al., 2017). Stroke-related mobility impairment often results from hemiparesis and related muscle mass loss, making it difficult to engage in sustained, moderate to vigorous PA (Ivey et al., 2005), and this contributes to physical inactivity and high amounts of sedentary behavior—up to 78% of daily and waking hours—in adults with stroke (Fini et al., 2017).

Epidemiological and experimental studies have demonstrated that decreasing sedentary behavior and increasing light-intensity PA can have beneficial cardiovascular and metabolic effects (Chastin et al., 2015). Increased attention has therefore been devoted to decreasing sedentary behavior (e.g., sitting less) and increasing nonexercise PA (performing light- or moderate-intensity activities) in adults with stroke (Manns et al., 2012). Promising pilot studies have

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used motivational interviewing (English et al., 2016), action planning (Ezeugwu & Manns, 2018), and behavioral activation (Kringle et al., 2019) to address PA; each intervention targets different mechanisms of action for modifying PA patterns, which is important because understanding mechanisms of action is key to designing effective interventions.

Bailey (2019, 2020) has recently investigated several potential psychosocial mechanisms of action for modifying PA in a sample of adults with stroke: outcomes expectations, self-efficacy, self-regulation, and social support. Qualitative and quantitative results indicated that participants have high self-efficacy for engaging in PA and perceive PA to be beneficial (Bailey, 2019, 2020). Participants also described how they conceptualized PA, but those findings were not reported in the prior publication (Bailey, 2020) because it was beyond the study's stated purpose. PA-related knowledge and attitudes are known predictors of PA performance (Costello et al., 2011); however, little is known about how adults with stroke conceptualize and categorize PA. How people with stroke conceptualize PA likely influences their engagement in PA, and understanding this potential mechanism of action may be important for designing and testing occupation-based PA interventions. Thus, the purpose of this article is to report our findings on how adults with stroke conceptualize PA.

Understanding how adults with stroke conceptualize PA is also important for occupational therapy practitioners whose clients are adults with stroke. Most occupations—the daily life activities in which people engage (American Occupational Therapy Association, 2014)—require people to be physically active, such as when performing basic activities of daily living (ADLs) and instrumental activities of daily living (IADLs). In addition, health management and maintenance is an IADL that is focused on developing routines for health and wellness promotion, which includes PA. Thus, occupational therapy practitioners are qualified to help adults with stroke identify and modify occupations, habits, and routines that decrease sedentary behavior and increase PA, a process that can be aided by understanding how adults with stroke conceptualize PA.

Method

In this article, we describe a subset of data from a larger phenomenological study conducted from January through April 2018 that explored psychosocial mechanisms of action underlying poststroke PA (Bailey, 2020). The Human Protection Research Office (institutional review board) at Washington University in St. Louis approved this research, and all participants provided written informed consent before participating.

Participants

Fifteen participants were recruited through purposive sampling from community-based stroke support groups and a stroke registry maintained by Washington University. People were eligible to participate in the study if they were ages 18–80 yr, >6 mo poststroke, community dwelling, ambulatory (>50 ft) with or without an assistive device, and able to provide informed consent.

Procedure

Participants (N = 15) initially completed a demographic questionnaire and provided information on self-reported ambulation status (able to walk ≥50 ft [15.24 m] without an assistive device [independent], with an assistive device [modified independent], or with supervision for safety [needs supervision]). Amount of self-reported PA (low, <600 MET min/wk; moderate, 600–2,999 MET min/wk; and high, ≥3,000 MET min/wk) was determined using the short form of the International Physical Activity Questionnaire (Craig et al., 2003). Semistructured interviews were conducted in participants' homes or in a university office by the principal investigator (PI; Ryan R. Bailey), who used an interview guide to facilitate discussion. For this article, the relevant interview questions were (1) "What comes to mind when you

hear the term *physical activity*?" and (2) "Not including exercise, what comes to mind when you hear the term *physical activity*?" Interviews were audio recorded and transcribed for analysis.

Data Analysis

The PI and a graduate student analyzed the interview transcripts using inductive content analysis (Elo & Kyngäs, 2008). They created codes independently, met to consolidate codes and create a codebook, and then coded all transcripts independently using the codebook. Finally, the PI and graduate student met a final time to categorize codes, using a bottom-up approach to combine and group codes on the basis of similarity and relatedness into main categories and subcategories, so they could identify key themes. Validity and reliability of the analytic process were established by using two coders, triangulating responses across participants, and achieving data saturation. After data analysis, identified themes were reviewed with 10 of the 15 participants (i.e., member checks were conducted) to ensure that the themes accurately reflected the participants' perceptions.

Results

Detailed participant demographic characteristics have been described elsewhere (Bailey, 2020). In brief, the median age was 64 yr (range = 43–79), and the median time since stroke was 4.2 yr (range = 0.6–24). There were 9 men and 6 women, and race/ethnicity was White (n = 10), African-American (n = 4), and Asian (n = 1). Participants were mostly classified as independent (n = 8) or modified independent (n = 6); 1 required supervision during ambulation. Scores on the International Physical Activity Questionnaire indicated that self-reported PA varied across the low (n = 8), moderate (n = 3), and high (n = 4) categories.

Three key themes emerged: (1) *moderate to vigorous PA,* (2) *PA necessary for performing daily activities and occupations,* and (3) *avoiding sedentary behavior.* The number of participants contributing to each theme is denoted in parentheses. Select quotations are included to illustrate each theme.

Theme 1: Moderate to Vigorous Physical Activity (n = 13)

In response to the first interview prompt, most participants described exercise, sports, and leisure activities that often require effort of moderate to vigorous intensity (n = 11). Participant responses included, "In my mind, I typically hear that as 'go to the gym, ride a bike, do something strenuous'" (Participant 2) and "What I think of physical activity, I think I'm going to work out. I golf" (Participant 11). Some participants (n = 4) also explained that walking was their preferred form of PA: "My main kind of exercise, if you want to call it exercise, is walking" (Participant 1), and "I don't really need a gym to be active. I go for walks around the community" (Participant 4). These responses suggest that many participants initially thought of exercise-related PA when asked to describe PA.

Theme 2: Physical Activity Necessary for Performing Daily Activities and Occupations (n = 12)

Several participants identified ADLs and IADLs in response to the first interview prompt (n = 7), which illustrates that they did not limit their perception of PA to exercise alone. An additional 5 participants identified similar activities in response to the second interview prompt. Examples of daily activities included house chores (e.g., laundry, vacuuming, cleaning), shopping, carrying groceries, yard work, and gardening. Participant 12 explained, "When a lot of people think of physical activity, they think of . . . exercise equipment. But for me, it was cutting grass. It was working in my garden. Just nominal stuff. But to me, it all helps."

Despite recognizing that ADLs and IADLs require physical exertion, participants downplayed the importance of these types of PA compared with those perceived to be more physically demanding, as illustrated in these two statements: "I look at it as having actual exercise, rather than just walking to the store or something. But it all counts"

(Participant 12), and "I go up and down stairs to do [laundry] and [go] back and forth in the house okay, but nothing overly [exerting]" (Participant 7).

Theme 3: Avoiding Sedentary Behavior (*n* = 9)

Avoiding too much sitting was important to most participants. Reasons given for avoiding sedentary behavior included not wanting to sit for long periods of time and avoiding boredom. Regarding too much sitting, Participant 8 explained, "Even if I'm at the computer for a long time, I'll get up and walk around a little bit just so you're not sitting for so long." Regarding boredom, Participant 14 stated, "Sometimes when I'm bored . . . instead of just laying around and watching TV, I'll get up and do something. To keep myself busy."

Participants also valued being busy over being sedentary. Participant 10 explained, "I go to Walmart or the grocery store or something. I push the cart around for a half hour or 45 minutes just to be out," and other participants stated, "I'm not sedentary" (Participant 7), and "I don't just sit around" (Participant 15).

Discussion

The results of this exploratory qualitative study suggest that the participants conceptualized PA broadly. Although they most readily identified activities requiring moderate to vigorous PA in response to the initial interview prompt, a majority of them also identified meaningful occupations (e.g., ADLs and IADLs). This is encouraging because many ADLs require light- and sometimes moderate-intensity effort, both of which confer beneficial cardiometabolic effects in sedentary people (Chastin et al., 2015; Manns et al., 2012). In a previous study, participants with stroke stated that PA improved physical and mental health, decreased functional dependence on others, and enhanced poststroke motor recovery, demonstrating that they valued PA engagement (Bailey, 2020). Despite the reported importance to participants of engaging in PA, only 40% of adults with stroke in the United States report meeting recommended levels of weekly moderate to vigorous PA (Bailey et al., 2019). Because some PA is preferred to none, adults with stroke can be encouraged to increase the amount of time they spend performing valued activities and occupations as an alternative—or a stepping stone—to engaging in more intensive PA.

Recent pilot interventions have targeted PA and sedentary behavior by modifying PA habits and routines. English et al. (2016) and Ezeugwu and Manns (2018) have used action plans and feedback to help participants with stroke identify habitual periods of sedentary behavior, set goals for substituting sitting time for light-intensity PA (e.g., standing and walking), and problem solve barriers to achieving goals. Placing a greater focus on ADLs and IADLs, Kringle et al. (2019) piloted an intervention in which participants identified periods of habitual daily sedentary behavior, scheduled personally meaningful activities to perform during these times, problem solved barriers to engaging in the activity, and tracked adherence to their planned activity. Each of these studies demonstrates preliminary feasibility of the investigated intervention, but further testing with larger samples and alternative treatment conditions is required to demonstrate efficacy and subsequent real-world effectiveness.

In direct support of Kringle et al.'s (2019) approach of scheduling meaningful activities to perform during periods of sedentary behavior, our findings suggest that performing daily activities and occupations is an acceptable form of PA for adults with stroke and can be leveraged to decrease sedentary behavior and increase overall PA. Moreover, previous work (Bailey, 2019, 2020) has demonstrated that participants with stroke value using self-regulation strategies (goal setting, action planning, problem solving) to engage in PA even though they admit to not frequently using such strategies. An efficacy trial of Kringle et al.'s intervention could determine the validity of self-regulation and performing daily activities and occupations as mechanisms of action for increasing PA in adults with stroke.

Strengths, Limitations, and Future Directions

Some strengths of this study include data saturation and triangulation of findings across participants, as evidenced by a majority of participants contributing to each theme, double-coding transcripts (i.e., using two coders) to limit researcher bias during analysis, and completing member checks with 10 of the 15 participants to confirm their agreement with the identified themes; these processes enhance the validity and reliability of study findings. Our findings are also consistent with those reported in the research literature we reviewed. Limitations of this study include a relatively small and heterogeneous sample of ambulatory, community-dwelling adults with chronic stroke; thus, these findings may not generalize to nonambulatory people and those not dwelling in the community. In addition, the findings were derived using observational, qualitative methods and thus require further empirical testing in a larger sample.

Despite these limitations, our findings suggest that engaging in nonexercise PA through the performance of daily activities and occupations and decreasing sedentary behavior are acceptable forms of PA for adults with stroke and may be important alternatives for people who cannot engage in more challenging, moderate to vigorous PA. If occupational therapy practitioners choose to implement such a strategy for increasing PA in clients with stroke, they need to carefully document the treatment content, client responses to treatment, and changes in client functioning from the start of treatment to termination.

Implications for Occupational Therapy Practice

The results of this study have the following implications for occupational therapy practice:

- Participants' conceptualizations of PA included moderate to vigorous PA, PA required for the performance of daily activities and occupations, and avoiding sedentary behavior.
- For some adults with stroke, participation in daily activities may be an acceptable alternative to engaging in intensive PA.
- Occupational therapy practitioners can help clients decrease sedentary behavior and increase nonexercise PA through identification of meaningful activities that require PA.

Conclusion

In this exploratory study, we investigated how a sample of community-dwelling adults with chronic stroke conceptualized PA. Perceptions included moderate to vigorous PA, PA required for the performance of daily activities and occupations, and avoiding sedentary behavior. These conceptualizations are potential mechanisms of action by which PA can be modified in adults with stroke. Moreover, observational and experimental studies have demonstrated that cardiometabolic benefits can result from decreasing sedentary behavior and increasing PA of any intensity (Chastin et al., 2015). Thus, future investigations should examine interventions that complement and enhance these conceptualizations for promoting the health and well-being of adults with stroke.

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