Promoting Physical Activity and Nutrition in People With Stroke

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The prevalence of cardiovascular disease, diabetes, and obesity is high in people with stroke. Risk factors for these conditions include hypertension, high cholesterol, and physical inactivity. These risk factors are common in people with stroke and often go unmanaged. Engagement in healthy behaviors is important for managing and preventing these risk factors and comorbid conditions. More specifically, physical activity and nutrition are key health behaviors for the management and maintenance of health in people with stroke. These health behaviors, by their very nature, are also occupations; thus, they are influenced by client factors, performance skills and patterns, and environments and contexts. This article discusses physical activity and nutrition within the context of the *Occupational Therapy Practice Framework: Domain and Process* and proposes potential roles for occupational therapy practitioners and researchers in developing, testing, and providing physical activity and nutrition interventions for people with stroke.

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In the United States, stroke incidence is nearly 800,000 per year, resulting in an estimated 6.8 million people currently living with stroke (Go et al., 2014). Activity and participation restrictions are common after stroke (Skolarus, Burke, Brown, & Freedman, 2014), and reducing these restrictions is an important part of stroke rehabilitation. Much evidence supports occupation-based interventions to improve the performance of activities of daily living (ADLs) after stroke, but evidence for occupation-based interventions to improve other areas of occupation affected by stroke is limited (Gillen, 2014; Wolf, Chuh, Floyd, McInnis, & Williams, 2015). Health management and maintenance, and more specifically, physical activity and nutrition, are occupations that require additional consideration by occupational therapy researchers and practitioners alike.

Health management and maintenance is an instrumental activity of daily living (IADL) that consists of “developing, managing, and maintaining routines for

health and wellness promotion” (American Occupational Therapy Association [AOTA], 2014, p. S19). Physical activity and nutrition are important components of health management and maintenance that may be overlooked by occupational therapy practitioners. Physical inactivity and poor nutrition contribute to the development of hypertension, high cholesterol, and obesity, which are risk factors for diabetes and cardiovascular disease. These comorbid conditions are common in people with stroke; it is estimated that 65% of people with stroke also have obesity; 75% have cardiovascular disease; and 80% have abnormal glucose metabolism, insulin resistance, or diabetes mellitus (Ivey et al., 2006; Kesarwani, Perez, Lopez, Wong, & Franklin, 2009; Roth, 1993). These conditions are important to minimize or prevent because they increase risk for disability, mortality, and recurrent stroke (Hardie, Hankey, Jamrozik, Broadhurst, & Anderson, 2004; Kernan et al., 2014). The good news is that these poor health behaviors and risk factors for chronic conditions are amenable to change.

Occupational Therapy's Role in Promoting Physical Activity and Nutrition

Physical activity and nutrition are health behaviors. They are also occupations, which makes occupational therapy especially suited for delivering interventions to improve these health behaviors. The manner in which physical activity and nutrition-based occupations are performed is influenced by personal values and beliefs (i.e., client factors), the ability to plan and execute health behavior components (i.e., performance skills), habits and routines (i.e., performance patterns), and the contexts and environments in which a person lives. Each of these areas is appropriate for occupational therapy intervention and future research.

Physical Activity

Physical activity is a broad health behavior that encompasses moderate-to-vigorous physical activity, light physical activity, and sedentary behavior. Moderate-to-vigorous physical activity (i.e., exercise, or “physical fitness,” as worded in the *Occupational Therapy Practice Framework: Domain and Process* [3rd ed.; AOTA, 2014, p. S19]) can modify cardiovascular risk factors and protect against recurrent stroke. Many clinician-supervised, exercise-based studies have resulted in improved cardiovascular fitness and decreased cardiovascular risk in people with stroke. Examples of exercise interventions include home-based resistive training and use of a stationary bike (Duncan et al., 2003), community-based water aerobics (Chu et al., 2004), and treadmill-based outpatient cardiac rehabilitation (Prior et al., 2011). Regardless of the intervention, moderate-to-vigorous physical activity is important for people with stroke. In addition, occupational therapy practitioners are qualified to supervise and train people with stroke in exercise-based interventions, and exercise and physical activity recommendations specifically for people with stroke have recently been published (Billinger et al., 2014).

Physical activity also encompasses activity that occurs during the performance of daily tasks (i.e., light-intensity physical activity) and sedentary behavior (i.e., low energy expenditure that occurs while seated

or lying down). Sedentary behavior and light-intensity physical activity occur during 75% and 23% of waking hours, respectively, in people with stroke, whereas moderate to vigorous physical activity occurs during only 0.5% of waking hours in this population (English et al., 2016). Examination of performance patterns reveals that people with stroke spend 12.15 hr sitting (television, 4.5 hr; computer, 1.2 hr; other, 2.7 hr) but only 1.3 hr performing IADLs (English et al., 2016) each day. Sedentary behavior is of special concern because it contributes to the development of chronic conditions through abnormal glucose and lipid metabolism independent of moderate to vigorous physical activity (Marshall & Ramirez, 2011). Fortunately, research has demonstrated that decreasing sedentary behavior by taking frequent activity breaks has beneficial effects on risk factors for chronic health conditions (Dunstan et al., 2012; Healy et al., 2008).

It is imperative that occupational therapy practitioners educate clients on the harms of sedentary behavior and the benefits of physical activity as well as help clients overcome barriers to being active. Barriers to physical activity include client and environmental factors such as depression, fatigue, stroke-induced musculoskeletal impairments, absence of social support, limited transportation, and inaccessible gym equipment (Billinger et al., 2014; Jurkiewicz, Marzolini, & Oh, 2011). Practitioners can also teach clients to modify daily habits and routines to decrease sedentary behavior. For example, clients can be instructed to break up long periods of sitting by standing during television commercials, stand to perform tasks that are often performed sitting, and choose a physical activity instead of watching television. Clients can also learn new leisure-based occupations that encourage physical activity (Drummond & Walker, 1995). A unique contribution by practitioners may be the modification of activities and environments for clients with stroke-induced motor and cognitive impairments to facilitate their physical activity.

Nutrition

Nutrition is important for health management and maintenance as well as the pre-

vention of secondary conditions. Adherence to Dietary Approaches to Stop Hypertension (DASH) and Mediterranean-style dietary patterns, for example, leads to improvement in stroke-related risk factors (Estruch et al., 2013; Fung et al., 2008). Although occupational therapy practitioners are not qualified to dispense advice on specific dietary needs, practitioners can educate clients about the benefits of eating nutritious foods (AOTA, 2013) consistent with these dietary patterns.

Another aspect of nutrition is meal preparation, an IADL that encompasses the selection and preparation of nutritious meals and that falls within occupational therapy's scope of practice (AOTA, 2014). Meal preparation (as well as food consumption) is a daily routine influenced by personal, environmental, and contextual factors such as personal preference (e.g., food choice), social interaction (e.g., cooking with a spouse or for a child), location (e.g., eating at home or a restaurant), and time (e.g., time of day, sufficient time to eat vs. eating on the run; Jastran, Bisogni, Sobal, Blake, & Devine, 2009).

Meal preparation requires motor and cognitive skills. For people with stroke, activity demands and the environments in which meal preparation occurs may need to be modified to facilitate adequate performance of this activity. For example, adaptive equipment may be required and the physical layout of the home kitchen may need to be modified to compensate for motor impairment as a result of hemiparesis, whereas meals may need to be simplified to compensate for cognitive impairment. Moreover, people with mobility impairment and stroke have identified several barriers to accessing and preparing nutritious meals (Westergren, 2008; Wylie, Copeman, & Kirk, 1999). For example, shopping for groceries can be difficult because items can be hard to reach and shopping carts may be challenging to maneuver. Transportation to a grocery store can be problematic because public transportation is inaccessible or other barriers, such as cracked sidewalks, prevent travel for people with disabilities.

Moving Forward: Implications for Practice and Research

First steps toward promoting health management and maintenance through physical

activity and nutrition include education and training. People with stroke and their families can be instructed on physical activity and nutrition guidelines, assisted to identify physical activity and nutrition goals, and trained in specific skills to accomplish their goals. Interventions should be selected to increase self-efficacy, strengthen self-regulation abilities (e.g., self-monitoring, goal setting, problem solving, feedback, and self-reward), and enlist social support because these factors are associated with increased physical activity and improved nutrition (Anderson, Winett, & Wojcik, 2007; Anderson, Wojcik, Winett, & Williams, 2006). Additionally, motivational interviewing is effective in modifying physical activity and nutrition behaviors (Martins & McNeil, 2009) and is a technique advocated for use by occupational therapy practitioners (Hildebrand, 2015).

Promoting physical activity and nutrition in the acute and subacute stages of stroke may be challenging because interventions often focus on poststroke medical management and functional skills as clients prepare to return home. Physical activity and nutrition training, however, can be integrated into traditional rehabilitation. During the acute stage, these health behaviors should be included as stroke prevention strategies during stroke education sessions. In inpatient or outpatient therapy settings, opportunities to decrease sedentary behavior and increase physical activity at home can be identified as clients perform preparatory strengthening and stretching tasks. Similarly, when clients practice meal preparation and kitchen mobility tasks, opportunities exist to discuss the importance of nutrition, identify nutritious foods, and practice healthy food preparation techniques. Home health is an important rehabilitation context for helping clients acquire the skills necessary for physical activity and nutrition because they can more easily incorporate these behaviors into their daily routines in their home environments.

Rehabilitation settings are not the only locations where occupational therapy practitioners can promote physical activity and nutrition in people with stroke. Opportunities exist for interprofessional collaboration and consultation with government agencies, community centers, and private businesses (Hildenbrand & Lamb, 2013) to

design services and programs that are targeted specifically to, and are accessible for, people with stroke. Practitioners can also enhance primary care providers' understanding of occupational therapy's role in health maintenance and management and seek referrals for health maintenance interventions for people with stroke. It has also been suggested that practitioners can provide primary care as a member of a primary care team (Muir, 2012). Regardless of the context in which occupational therapy is provided, practitioners should repeatedly and consistently deliver messages to clients to engage in physical activity and nutrition-based occupations, across settings and providers.

In addition to practitioners, occupational therapy researchers have an important role to play in promoting physical activity and nutrition. Although home- and community-based exercise programs are effective in improving cardiovascular health, adherence to these programs after discharge from therapy services or a research study is low (Forkan et al., 2006; Jurkiewicz et al., 2011). Interventions that both increase physical activity and promote long-term adherence are needed. Self-management programs for people with stroke often use strategies to promote behavior change, such as teaching problem-solving and goal-setting skills, and enhancing self-efficacy for stroke management tasks (Jones & Riazzi, 2011; Lennon, McKenna, & Jones, 2013). Researchers should examine whether incorporation of behavior change strategies into existing exercise programs can increase adherence.

Other interventions needed include occupation-based approaches to decrease sedentary behavior and increase physical activity. For researchers, it may be most prudent to develop interventions that teach people to modify existing occupations and performance patterns. For example, phone applications, wearable technologies, or low-tech reminders placed around the home to alert clients to take frequent standing breaks; guide them through short, chair-based exercise routines; or remind them to go for a short walk are potential interventions that can be studied for their effectiveness in decreasing sedentary behavior and increasing physical activity.

The effectiveness of standardized interventions for improving nutrition in people with stroke is another area that researchers can examine. Standardized, community-based programs that teach principles of healthful nutrition to older adults were found to improve diets in older adults (Wellman, Kamp, Kirk-Sanchez, & Johnson, 2007), and dietician-led nutrition classes for people with stroke that provided hands-on training in preparing healthy meals, and incorporated the use of adaptive kitchen equipment when needed, were effective in changing nutrition behaviors (Rimmer et al., 2000). For researchers, a community-based program for people with stroke that combines instruction with hands-on, occupation-based training in selecting, obtaining, and preparing healthy foods may provide promising results.

Conclusion

Physical activity and nutrition are important health behaviors for health management and maintenance in people with stroke. These health behaviors are influenced by personal, environmental, and occupational factors that are amenable to occupational therapy intervention. Occupational therapy practitioners should promote these behaviors in clients through education and skills training across treatment visits and treatment settings and over time. Although the discussion in this article was limited to physical activity and nutrition, other health behaviors (e.g., sleep hygiene, medication management, stress management) are also concerns for people with stroke and could likely benefit from occupational therapy intervention and further research. ▲

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