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Exercise perceptions among people with stroke: Barriers and facilitators to participation

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Abstract

Background/Aims—People with stroke continue to lead sedentary lives despite the multiple benefits of exercise. Knowledge regarding stroke survivors' conception of exercise, which is essential for a thorough understanding of the barriers and facilitators to exercise, is lacking. This study aims to explore the perceptions of exercise among stroke survivors, including their concepts and definitions of exercise, as well as their perceptions of barriers and facilitators to exercise.

Methods—This study utilized a qualitative exploratory design. Focus groups were conducted with 11 community dwelling participants with stroke (mean 8 ± 3 years post stroke). Data was analysed using content analysis methods.

Findings—Six themes that provided information regarding participants' perceptions of exercise were identified: mobility, balance, self-efficacy, outcomes, support, and exercise as part of an active or healthy lifestyle. Although participants internalized specific benefits of exercise, they did not demonstrate an internalized link between exercise and stroke risk. Low self-efficacy was identified as a barrier to participating in exercise, whereas, support to exercise (e.g., external encouragement, qualified personnel) was identified as a facilitator.

Conclusion—These findings may provide insight when developing exercise interventions which optimize adherence for people with stroke.

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CONFLICT OF INTEREST

All authors report no conflict of interest.

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Keywords

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INTRODUCTION

The many substantial health benefits of exercise for stroke survivors have been well documented. Participation in regular physical activity in people with stroke has been associated with improved mobility and motor function, increased cardiovascular fitness, greater strength and bone density as well as increased quality of life (Pang et al. 2006; Eng et al. 2008; Saunders et al. 2009). Moreover, inactivity is now recognized as a modifiable risk factor for recurrent stroke as well as for cardiovascular disease. Stroke is a leading cause of long term disability while recurrent stroke and cardiovascular disease are the leading causes of mortality among stroke survivors. Almost 30% of strokes occurring annually are recurrent strokes (Sacco et al. 2006).

Despite clear evidence of these benefits, most people with stroke continue to lead sedentary lives. The American Heart Association and Stroke Association Council recommend that people with stroke obtain at least 30 minutes of moderate level physical activity most days of the week (Sacco et al. 2006). Studies examining activity levels have found that people with stroke rarely meet recommended levels, and are less active than individuals with many other chronic conditions (Ashe et al. 2007; Ashe et al. 2009; Rand et al. 2009).

Given the important benefits of regular exercise and the risks of inactivity for people with stroke, facilitating increased levels of activity for this population is a vital goal of rehabilitation. Indeed, the American Heart Association recognizes the importance of engaging in physical activity when outlining the three major goals of rehabilitation for people with stroke: preventing complications from prolonged inactivity by regaining pre-stroke levels of activity, preventing recurrent stroke and cardiovascular events, and improving cardiovascular fitness (Gordon et al. 2004). In light of the important place of exercise in stroke rehabilitation, a pressing question for this field is what explains the low levels of exercise among people with stroke.

One obvious potential factor is the multiple impairments confronting people with stroke. Common difficulties include mobility impairments, comorbid cardiovascular disease, cognitive impairments, and psychological challenges such as depression, social isolation, and lack of confidence and sense of control (Carod-Artal et al. 2000; Salter et al. 2008). However, evidence suggests that despite demonstrating sufficient ability (as measured by distance walked in the 6 Minute Walk Test), many stroke patients perform little physical activity at home or in the community (as measured by activity counts using an accelerometer or from a physical activity questionnaire) (Ashe et al. 2007; Ashe et al. 2009; Rand et al. 2009).

Facilitating engagement in physical activity is the subject of a large body of research that borrows its theoretical models from health psychology research. Studies of health behaviour change which focus on physical activity tend to draw on the basic precepts of social learning

models. These models, although written as separate psychosocial theories, use the same underlying principles in which personal, behavioral, and environmental factors serve as interrelated determinants of a particular behavior (Marcus et al. 2006). The key determinants include: self-efficacy or the perceived capacity to perform the specific behavior, expected outcomes of the behavior in social, physical and self-evaluative realms, knowledge of health risks and benefits, experience of benefits, and perceived barriers and goals (Bandura 2004; Nieuwenhuijsen et al. 2006).

A growing body of research applies these basic determinants when examining exercise among people with disabilities and a handful of studies focus specifically on stroke survivors. These studies have identified numerous environmental and personal factors that influence exercise behaviour. Environmental factors include access to transportation, program costs, access to and information about exercise programs, as well as support from professionals, peers and caregivers. Personal factors include motivation, lack of energy, fear of injury or recurrent stroke, benefit experiences and expectations, self-efficacy, perception of stroke impairments and exercise history (Shaughnessy et al. 2006; Damush et al. 2007; Resnick et al. 2008; Rimmer et al. 2008).

While existing research highlights a number of factors that relate to exercise behaviours, the specific barriers and facilitators that matter most and the manner in which they do so depend importantly on individuals' conceptions of exercise. Exploring these conceptions is particularly important because 'exercise' is a somewhat ambiguous term and may refer to a host of different behaviours. For instance, although 'exercise' and 'physical activity' are distinct concepts, these terms are often used interchangeably. Casperson et al. (1985) delineates these terms as follows:

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness.

Consequently, our exploratory study examines the perceptions of exercise among people with stroke by exploring 1) their definitions of exercise and physical activity and 2) the factors that contribute and impede the performance of exercise and/or physical activity.

METHODS

To facilitate our understanding of stroke survivors' perceptions of exercise and physical activity, we employed an exploratory qualitative approach. Qualitative enquiry acknowledges that people perceive and develop unique interpretations of their environment and thereby construct their own realities (Carpenter 2004a). Thus a qualitative approach was thought necessary to understand the meaning of exercise and physical activity among a group of individuals in the context of living with a chronic condition such as stroke. Focus groups were employed as a means of obtaining a wide range of initial interpretations of the terms exercise and physical activity. Interaction between group members was thought to

facilitate more spontaneous views of these terms (Sim and Snell, 1996). Moreover, focus groups have been identified as appropriate for the exploration of clients' experiences of their health within their own and greater health care communities (Sim and Snell, 1996; Carpenter 2004b). Ethical approval for the study protocol was obtained from local university and hospital review boards.

Data Collection

Participants were volunteers recruited from previous patients of a local rehabilitation centre, as well as from community notices. Notices were mailed to the former patients informing them of the study and inviting them to participate in a focus group. Notices were also posted in the community such as at rehabilitation centers, community centers and stroke recovery groups. The inclusion criteria were: 1) at least one year post stroke and 2) living at home. A total of eleven individuals expressed interest in participating and all were selected to take part in the focus groups. Individuals were then scheduled into one of two focus groups in order to ensure group size was large enough to facilitate discussion while simultaneously not being too large so that it precludes ample contributions from each member (Carpenter 2004b). All participants provided written consent before the start of the focus groups. One of the authors (author 3) facilitated both focus groups and utilized a discussion guide based on open ended questions regarding participants' perceptions and definitions of exercise and physical activity (Table 1). The purpose of the discussion guide was to assist the moderator to generate discussion and was therefore not used as a standardized script. To facilitate group rapport and encourage participants to talk freely, group members took part in an 'ice breaker' activity at the beginning of the session. When some individuals did not contribute to a specific topic being discussed, the facilitator asked these individuals if they had any additional comments to ensure the whole sample was represented. An observer present during both groups took hand written notes, aided in summarizing key points and assisted with clarifying meaning of participants' statements during the group sessions. The focus groups were tape recorded with permission of the participants and lasted for approximately 2 hours.

Data Analysis

Data was analysed in steps based on qualitative content analysis methods (Graneheim and Lundman, 2004). Graneheim and Lundman (2004) describe the process of qualitative content analysis as a 'back and forth movement' between the unit of analysis and its parts. The unit of analysis represents the object under study such as whole interviews or in our case the focus group transcripts. The audiotapes were transcribed immediately following the focus groups by the group moderator. The transcripts were read and reviewed separately by the authors (author 1, author 3). Independently generated categories and themes were compared and the resulting themes were agreed upon by the authors.

The transcripts were read several times in order to get a feel for the discussions as a whole. The text was then split up into meaning units that ranged from a couple of words to a paragraph. Codes were then used to label these meaning units. Categories were created to group the commonality among the codes and mainly consisted of the content aspects of the discussions. Example categories included definition of exercise and physical activity,

barriers to exercise and benefits of exercise/physical activity. Graneheim and Lundman (2004) describe the process of creating categories as a primary feature of qualitative content analysis.

Finally, themes arose from the data when examining the underlying meaning and concepts that cut across codes and categories and which contributed to our understanding of the question, 'what do people with stroke consider when they think about exercise and physical activity?'. In this regard, the themes reflected both the manifest and latent content of the text. Graneheim and Lundman (2004) describe the manifest content as the visible and obvious components of the text and latent content as the interpretive meaning underlying the text.

To ensure data credibility, the group observer conducted member checking by summarizing and verifying key points with participants at the end of each session. Results were further enhanced by incorporating multiple researchers to independently review the transcripts and generate categories and themes. Finally, representative quotes were selected in order to illustrate themes and categories and to assist readers judge the transferability of the findings. Pseudonyms are provided to protect the anonymity of the participants.

RESULTS

A total of 11 participants took part in the focus groups. The demographic information of the participants are outlined in table 2. In summary, participants were several years post stroke (average time 8 ± 3 years post stroke), the majority of participants were male (8/11) and all were ambulatory. Analysis of the participants' comments revealed 6 themes: Mobility, balance, self-efficacy, support, outcomes, and exercise as part of an active or healthy lifestyle.

Mobility

Mobility, defined by the groups as the act of moving your body or parts of your body, emerged as a theme in relation to discussions regarding the definition of and reason to exercise. Two participants stated 'mobility' while one participant offered 'body movements' as a definition of exercise. Other participants seemed to agree that movement was a defining characteristic, for example: 'Me personally, the best exercise that I've ever had, and that is tai chi. It is, you know. It moves every part of your body.' [Grace] The expectation of or hope for increased mobility served as a motivating factor to exercise for many participants. Indeed, many participants attributed their own improvements in mobility to exercise with comments such as: ... 'to know that you're capable of moving this part of your body or going from A to B.' [Rose] and 'I realized to keep this arm active, I've got to put it to use.' [Jason].

Walking was the most frequently mentioned mode of exercise, (the majority of participants mentioned walking and also appeared to be the activity performed most often by those participants). Other forms of exercise mentioned were strength training, stationary bicycle, 'going to the gym', swimming, stretching, tai chi, golf, squash and chair and water aerobics.

Although participants easily identified different forms of exercise, they appeared to have more difficulties when asked to decipher between exercise and physical activity.

Half of the participants agreed that exercise and physical activity were the same thing. As one participant explains, 'I think I do exercise by keeping active, doing active stuff, it's exercising' [Sam]. The other half of the participants initially perceived the two terms as different concepts, but upon further discussion, the line between the two terms began to blur. One participant initially used type of activity to distinguish between physical activity as illustrated in this comment, 'Exercise to me would be moving your arms and legs. Uh, physical activity would be walking the dog or cleaning your house.' [Melissa]. However the same participant later described walking her dog as a form of exercise. Later on in the discussions, intensity was used to distinguish between two forms of exercise with less intense activities such as 'walking for pleasure' making up one form and walking where 'you really gotta push it' another form. The use of the terms was not, however, straightforward for these participants as illustrated in the statement below:

'no, I think physical (activity), you know it also is I'm doing something about my body and um becoming....feel better, you know, look good, the whole thing- it's all part of it and it should be....it should be under exercise as well, even though it is a pleasure.' [Grace]

Balance

Many participants identified balance as an important factor for both exercising and participating in the community. For one participant, improved balance was an important motivation for exercising. He defined exercise as: 'To improve my balance' [Peter]. Additionally, many participants indicated that a certain level of balance was a prerequisite for exercise.

'Before you exercise, the thing that really helped me to get to the exercise part is balanceabout balance because coming off a stroke- out of a stroke, you know- you have to learn to walk again and that involves balance.' [Jason]

Many group members mentioned fear of falling and losing one's balance. While this fear was most often discussed in the context of community participation in general, one participant identified balance as a barrier to participating in a community exercise program.

'Do you know what I am most afraid of?-in a mall right now cause its happened to me so many times. You're walking along with your cane and in their hurry, especially the younger people, they hit you. They hit your cane this way, and they hit your cane that way, coming down on your knees and breaking a leg.' [Rose]

'I would hesitate to go to a standard community centre class, you know you asked me to do the treatment, I'm going to fall.' [Peter]

Exercise Self-Efficacy

The ability to perform exercise activities acted as both a facilitator and barrier to exercise for many participants. One's specific abilities and inabilities in relation to exercise were so

instrumental for one participant that she defined exercise as, 'It's what you're capable of. It's different for everybody.' [Rose] Being able to master the required components of exercise appeared to determine what activities the participants chose to perform. One participant explains how he started going to the gym regularly when he learned how to use the machines and mastered a system.

'I would go to the gym once I learned how to do that, I could, I'm there for two hours.... I've got certain machines that I do and certain ones that I go back to, so I do a complete circuit.' [Corey]

Although one's ability to perform an activity often served to facilitate exercise for some, a number of the participants discussed how their perceived inability to perform particular activities presented a barrier to exercise.

"And because ordinary people kick the ball or do the rowing as much as the others, you tend to shy away from it, because you can't make it in our condition, even if you want to.... because even if our heart is willing, but not our body, not our body." [Peter]

Support

All participants identified the need for community exercise programming for stroke survivors. Although a few participants discussed utilizing general community facilities such as a community pool or gym, overall, participants agreed that general community exercise programmes didn't seem to meet the needs of people with stroke. As [Jason] stated, "I don't think they really understand the stroke situation."

The majority of the participants agreed that a community exercise program should be run at least 3 days a week with half of them preferring every day. The participants stressed the importance of receiving support from qualified personnel and felt it was an essential feature of any future programs. Although some participants used the term "professional" to describe this qualified personnel, they were not specific about the type of professional. Most people agreed that people leading the exercise programs should be able to understand the challenges and capabilities of people with stroke and thus be able to provide support in the following ways: providing exercise information, ensuring safety and comfort, and providing external motivation in a social venue. Furthermore, the desire among these stroke survivors for additional support when exercising is consistent with the substantial barriers to exercise presented by low self-efficacy. Some examples of the type of support participants sought include:

Providing information and support:

'You need somebody there too. You know, if you have all the facilities....what to do? And she says, okay, you go from this machine to this machine, and this one, and this one. Then you tell them, the different work outs' [Jeff]

Ensuring safety and comfort:

‘There’s someone who knows their fitness thing, who can support initially, you know give you exercises you should be doing, they help everyone. This is what you need to improve yourself or somebody to monitor you to make sure that you’re safe and that you’re actually doing it properly and you’re getting maximum benefit.’ [Sam]

Providing external motivation:

....‘if someone comes along and tells me, okay, three times a week you’re going to do this, fine. I look forward to it. But for me to initiate of that nature, I’d have a hard time with that.’ [Nathan]

Outcomes

When asked to define and explain why we should exercise, participants identified multiple physical and psychological benefits. Some of these benefits were often described in general terms such as ‘improves your body and your mind’ [Neil] or ‘But it’s, it’s just good and you feel better.’ [Rose]. As well as increasing mobility, other specific physical benefits identified were losing weight and increasing flexibility and strength. One participant identified the benefit of increasing functional capacities when discussing what exercise meant to him. ‘It’s an exercise doing swallowing; it helps you swallow’ [Peter]. Another participant suggested that exercise improves bone health in the following statement. ‘keeps your bones from getting brittle’ [Rose] Only three participants discussed the cardiovascular benefits of exercise with comments such as “Getting your blood going” [Melissa] and ‘Number 1: get your heart going.’ [Grace].

Interestingly, only one member identified the prevention of a second stroke as a reason to exercise.

‘Do you know after you’ve had a stroke, you just- all of us, were just waiting for the second, you know, And, in between, doing this, by doing exercise, doing this and that, at least you’re helping yourself, ... all the motivation is there is to stop you from getting the second one, you know.’ [Grace].

Exercise as part of an Active or Healthy Lifestyle

Focus group members also discussed exercise in the context of living a healthy or active lifestyle. Becoming less active since the stroke was difficult for many group members and exercise offered a way to maintain activity and ‘keep you from just vegging out’ as one participant explained. The need for community exercise programming expressed by participants also appeared to coincide with a desire to have a more active lifestyle as seen in the following statement:

‘Socially, if it’s physical, it becomes social, and like he said, like I used to work also before I became disabled, and this fills the gap of just sitting at home not doing anything. It gives you more meaning to your life. So you get up every morning, and you know you have to go, whether it’s exercise or being with people or doing something. It gives you something to look forward to and keeps you physically and mentally active.’ [Sam]

Exercise also appeared to be a component of living a healthy lifestyle for many participants. Maintaining one's health or 'longevity' motivated these participants to exercise as conveyed by the following participant:

'I walk every day. I get off the bus and we were supposed to meet at 10:30, you know it's 10 so I walk a few blocks because it's not raining.... You just feel that way. But uh, you know. Overall I guess it's your general health, you know.' [Jason]

A few of these participants suggested that their lifestyle was not healthy when discussing factors that might have precipitated their stroke. Identified factors included high cholesterol, stress, hypertension and not following up with a doctor. Finally, another participant suggested that her concept of 'healthy' changed after having a stroke and believed that having a stroke should serve as a "warning". Interestingly this is the same participant who identified preventing another stroke as motivation to exercise.

'When you've got a stroke, really, it's a warning- if you live, you're a warning, you know, because there's a reason why you had a stroke, usually. Like 90% of them or 80%, you know what I mean? Usually you're too fat or you're-you drink too much, you smoke, or you know, midlife diabetes, you know. So number 1, you have to relearn how to – to get your skills, your life skills, you know, bottom line; but then you have to be healthy – get yourself healthy again, you do; I mean that is the bottom line, otherwise you're wasting all this time- no matter what.' [Grace]

DISCUSSION

The focus group discussions revealed three major findings about the perceptions of exercise among people with stroke in our study. 1) Although participants internalized specific benefits of exercise, they did not demonstrate an internalized link between exercise and stroke risk. 2) Mobility and balance were important motivators for and prerequisites of exercise. 3) Support, given limited self-efficacy, was identified as a potential facilitator to exercise.

The remainder of this section discusses these findings in turn.

First, the link between exercise and recurrent stroke was surprisingly absent from the focus group discussions. Only a few participants clearly mentioned cardiovascular benefits of exercise and only one person described a direct link between exercise and stroke risk as a motivating factor. This finding is consistent with Jones et al. (2010), who in their review of stroke knowledge and awareness studies, found that having either experience of or being at risk of a stroke does not necessarily translate into increased stroke knowledge. Our findings offer clinical relevance because although physical activity is a modifiable risk factor for recurrent stroke, our findings suggest that people with stroke might not be aware of this link.

One precondition for adopting healthy behaviours such as exercise is knowledge regarding lifestyle habits (Bandura 2004). The importance of understanding the benefits of regular healthy behaviours suggests potential for the clinical application of physical activity education among people with stroke. Education from health care providers, however, has

been shown to have variable effects in the literature (Greenlund et al. 2002; Van der Ploeg et al. 2006; Boysen et al. 2009). The most recent randomized trial found that repeated education and verbal instructions regarding physical activity to patients with a stroke did not result in an increase in their physical activity participation (Boysen et al. 2009). These findings suggest that increasing the knowledge of the benefits and activities involved in exercise is not sufficient for increasing physical activity among stroke survivors. Indeed this finding is in line with Bandura's social cognitive theory in which knowledge regarding lifestyle habits is only one of the core sets of determinants that influence behaviour change. Other determinants thought to influence behaviour change within this model include 1) self-efficacy (the belief that has control over that behaviour change), 2) outcome expectations (the expected benefits and costs of performing that behaviour), 3) the goals people set and plans they create to attain them and finally 4) the perceived facilitators and barriers to achieving these changes (Bandura 2004).

Another theory among the health psychology literature provides another possible explanation for the apparent disconnect between exercise and secondary stroke risk among stroke survivors. Leventhal et al. (2008) highlight two factors that affect the adoption of healthy behaviours. Adoption of health behaviours depends on the fit between individuals' conception of illness and representation of a possible treatment. In the case of stroke, this theory would suggest that when an individual perceives a stroke as a lifelong condition that resulted from lifestyle habits that include a lack of exercise, and also believe that reducing their risk of a recurrent stroke is necessary, they would be more likely to participate in exercise activities. Adoption of health behaviours also depends on peoples' expected indicators regarding treatment effectiveness. In the case of exercise as a treatment for stroke, an indicator such as 'reduced stroke risk' is considerably more abstract and difficult to perceive than indicators such as increased mobility. Accordingly this theory offers one explanation why outcomes such as improved mobility and balance were frequently cited by participants while improved cardiovascular health and reduced stroke risk were not. The ability of these theories to explain exercise behaviour among people with stroke warrants further examination. Studies exploring stroke survivors' perceptions of secondary stroke risks in general, and more specifically, the links between exercise and these risks, could greatly contribute to exercise education and programming for this population.

Second, group discussions revealed that mobility and balance were important motivators of and prerequisite for exercise. Fear of falling and losing one's balance was a barrier to exercise and community participation for several group members. Walking was the most frequently identified and practiced mode of exercise among our participants which might explain why balance was seen as a prerequisite for many participants. It should be noted that all our participants were ambulatory. Walking might not play such a central role for another group of stroke survivors who are not independently ambulatory.

The central role of mobility and balance in our study is consistent with the literature. Studies show that mobility impairments both impede participation in physical activity among the general older adult (Ashe et al. 2007; Ashe et al. 2009) and stroke populations (Damush et al. 2007) and the goal of improving one's mobility provides motivation for participating in rehabilitation (Maclean et al. 2000; Resnick et al. 2008). Previous studies have demonstrated

that balance confidence is related to participation in both physical activity and social integration and is much lower among people who have experienced a stroke (Ashe et al. 2007; Pang et al. 2007). Given the significance of balance self-efficacy in the literature and among the participants in our study, exercises performed to increase one's balance might be motivating for people who have experienced a stroke. Furthermore, the importance of ambulation to our participants suggests that maximizing ambulatory ability during stroke rehabilitation has implications not only for enabling functional independence, but also for enabling secondary stroke risk reduction.

Third, the need for support, given limited self-efficacy, was also an important theme from the focus group discussions. Participants highlighted the need for more scheduled exercise programs that provided information about what exercises to perform, ensured their safety and comfort and provided external motivation. These needs are consistent with findings from Wiles et al. (2008) which explored stroke survivors' experiences with community exercise programmes post discharge from rehabilitation. Participants from this study identified a need for instructors who were knowledgeable about prescribing exercise for individuals with stroke and who provided monitoring and supervision while performing the exercises. Moreover, opportunity to interact with fellow stroke survivors was also identified as a potential motivating factor for these individuals. The consistency between our findings suggests that similar unmet support needs appear to persist well after discharge from rehabilitation.

These aspects of support are consistent with information thought to support self-efficacy expectations according to self-efficacy theory (Bandura, 1977). Lack of confidence in their abilities to control their bodies is a common finding among studies examining the experience of living with stroke (Salter et al. 2008). Moreover, feelings of not knowing how to perform or not feeling capable of performing exercises among our participants is consistent with studies that have found decreased exercise self-efficacy as a barrier to exercise after a stroke (Shaughnessy et al. 2006; Rimmer et al. 2008).

Our findings suggest a continued perceived gap in community exercise programming for this population and suggest that community programmes aimed at increasing and maintaining physical activity, together with exercise self-efficacy among people with stroke should be explored further.

This study has limitations that need to be considered when determining transferability of our findings. For instance, the sample size is small and consisted of a convenience sample of volunteers. People who responded to the notices might have different perceptions and experiences with exercise than those who didn't respond. Furthermore, we could not explore participants' perceptions of exercise in relation to their level of activity. It is likely that people who exercise regularly would have different perceptions and definitions of exercise from those who do not exercise regularly. Finally, since all of our participants were ambulatory, our findings can only be generalized to individuals with mild to moderate impairments. As the majority of stroke survivors eventually regain their ability to ambulate independently (Jorgenson et al. 1999), our results are relevant to a large proportion of stroke survivors.

CONCLUSIONS

In conclusion, the focus groups highlighted that exercise was important to this group of people with chronic stroke. Our findings revealed that mobility, balance, ambulatory ability and self-efficacy emerged as determining factors. Furthermore, our results suggest that people with stroke might not be aware of the link between exercise and stroke risk.

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KEY POINTS

- Recurrent stroke and cardiovascular disease are important reasons to promote exercise among stroke survivors.
- The link between exercise and stroke risk might not be internalized among stroke survivors.
- Future studies should explore the link between stroke survivors' perceptions of secondary stroke risk and exercise to their physical activity levels.
- Maximizing mobility and more specifically, ambulatory ability has potential implications for physical activity levels and secondary stroke risk reduction.
- Future research should explore the effect of community programmes for individuals with stroke that promote exercise and address exercise self-efficacy.

Table 1

Focus Group Guide

Focus Group Guide	
1	How would you define physical activity?
2	What kinds of things do you consider to be physical activity?
3	How would you define exercise?
4	What kinds of things do you consider to be exercise?
5	Why do you think you should do physical activity?
6	Why do you think you should do exercise?
7	What kinds of things encourage you to continue participating in physical activity or exercise?
8	What kinds of things do you see as stopping you from being more involved in physical activity or exercise?

Table 2

Participant Characteristics

Characteristics of Participants (n = 11)	
Variables	Distributions
Age	
Mean (SD)	69.9 (10.4)
Years since stroke	
Mean (SD)	8.0 (3.0)
Gender	
Male	8 (73%)
Female	3 (27%)
Ethnicity	
Caucasion	7 (64%)
Non-Caucasion	4 (36%)
Relationship Status	
Single	5 (45%)
Married	6 (55%)
Mobility	
Ambulatory	11 (100%)
Years of education	
Mean (SD)	13.8 (1.7)

SD: Standard Deviation