Barriers to and Facilitators of Access and Participation in Community-Based Exercise Programmes from the Perspective of Adults with Post-stroke Aphasia

Diane C. Blonski, BSc, MSc, MScPT;* Megan Covert, HBSK Kin, MScPT;*
 Roxanne Gauthier, HBSK Kin, MScPT;* Alanna Monas, HBA Kin, MScPT;*
 Danielle Murray, HBSK Kin, MScPT;* Kelly K. O'Brien, BSc, BScPT, PhD;*
 Anita Debbie Mendelson MSc., BMR(PT);*† Maria Huijbregts, BScPT, MHSK, PhD*‡

ABSTRACT

Purpose: To explore communication-related experiences with accessing and participating in community-based exercise programmes from the perspective of adults with post-stroke aphasia. **Methods:** Adults with mild to severe post-stroke aphasia were recruited from the Aphasia Institute (AI), Toronto, Canada, for a qualitative descriptive study using semi-structured, in-depth one-on-one interviews. Participants were asked to identify facilitators of, barriers to, and strategies for joining and participating in exercise programmes. Interview data were analyzed using conventional content analysis. **Results:** Ten adults with mild (40%), moderate (40%), or severe (20%) aphasia participated in this study. The majority of participants were men (60%) aged 60–69 years (40%). Participants experienced a combination of communication, environmental, and personal facilitators of and barriers to accessing and participating in community-based exercise programmes. Strategies to enhance participation can be applied at both programme and individual levels. **Conclusions:** Findings may inform clinical practice and programming to optimize access to and participation in community-based exercise programmes for adults with post-stroke aphasia.

Key Words: exercise; aphasia; stroke; social participation; program accessibility.

RÉSUMÉ

Objet : Explorer les expériences de communication liées à l'accès et à la participation à des programmes d'exercices communautaires vécues par des adultes atteints d'aphasie à la suite d'un accident vasculaire cérébral (AVC). **Méthodes :** Une étude descriptive qualitative a été menée au moyen d'entrevues individuelles approfondies semi-structurées. Des adultes atteints d'aphasie légère à grave à la suite d'un AVC ont été recrutés au sein de l'Aphasia Institute de Toronto, au Canada. On a demandé aux participants d'indiquer les éléments facilitant leur inscription et leur participation à des programmes d'exercices, de même que les obstacles et les stratégies habilitantes. On a eu recours à l'analyse de contenu traditionnelle. **Résultats :** Dix adultes atteints d'aphasie légère (40 %), modérée (40 %) ou grave (20 %) ont participé à l'étude. La majorité des participants étaient des hommes (60 %) âgés de 60 à 69 ans (40 %). Les participants ont fait l'expérience d'un ensemble d'éléments facilitant la communication, de facilitateurs environnementaux et personnels, et d'obstacles à l'accès et à la participation aux programmes d'exercices communautaires. Les stratégies visant à améliorer la participation sont autant applicables aux programmes qu'aux personnes. **Conclusions :** Les constatations peuvent éclairer la pratique clinique et l'élaboration des programmes afin d'optimiser l'accès et la participation aux programmes d'exercices communautaires des adultes atteints d'aphasie à la suite d'un AVC.

Approximately 300,000 people in Canada are living with the sequelae of stroke, meaning that stroke is the leading cause of disability.¹ Aphasia, a communication impairment that affects a person's ability to read, write, express, or understand language,² affects approximately

35% of people with stroke.³ Adults with post-stroke aphasia may face a host of challenges, such as social isolation, loss of autonomy, and stigmatization, that increase the impact of stroke.⁴

Exercise is one strategy that can be used to mitigate

From the: *Department of Physical Therapy, University of Toronto; †Baycrest; ‡Family Service Toronto, Toronto, ON.

Correspondence to: Maria Huijbregts, Family Service Toronto, 355 Church St., Toronto, ON M5B 1Z8; mariahu@familyservicetoronto.org.

Contributors: All authors designed the study; collected, analyzed, and interpreted the data; drafted or critically revised the article; and approved the final draft.

Competing Interests: Maria Huijbregts is a member of the Board of Directors of the Aphasia Institute.

This research was completed in partial fulfillment of the requirements for an MScPT degree at the University of Toronto. Kelly K. O'Brien is supported by a Canadian Institutes of Health Research (CIHR) New Investigator Award.

Acknowledgements: The authors gratefully acknowledge the study participants for their commitment to the study. They thank the Aphasia Institute and staff Natalie Alfano, Fatima Cabral, and Lisa Debow for their support.

post-stroke complications. Exercise can play an important role in improving function and mobility, which can facilitate independence in activities of daily living and enhance overall quality of life.^{5,6} Community-based exercise programmes encompass a wide variety of exercises, including aerobics, stretching and strengthening exercises, and functional activities. While these programmes effectively promote social interaction and can improve self-efficacy for people with stroke,⁷ several barriers may obstruct access to and participation in these programmes, such as high programme costs, lack of awareness of programmes, inadequate access to transportation, and lack of knowledge about how to exercise.⁸ People with post-stroke aphasia may experience additional barriers to social participation that may influence their participation in community-based exercise.^{9,10} One study reported that communication impairment interfered more strongly with participation than physical limitations.¹⁰ However, because the authors did not provide details about type of activity or specific exercise programmes, the experiences of adults with post-stroke aphasia who attempted to access, accessed, and/or participated in community-based exercise programmes remain unclear.

Our aim was to understand communication-related facilitators of and barriers to access and participation in community-based exercise programmes from the perspective of adults with post-stroke aphasia. Specific objectives were (1) to describe their experience, (2) to understand communication-related facilitators and barriers, and (3) to identify strategies to enhance access to and participation in community-based exercise programmes.

METHODS

Study design

We conducted a qualitative, descriptive, cross-sectional study. To facilitate communication between researchers and participants, the research team completed a 2-day training course in Supported Conversation for Adults with Aphasia (SCA)¹¹ with a speech-language pathologist (SLP) from the Aphasia Institute (AI). SCA¹² uses pictographs, gestures, body language, and spoken and written keywords to facilitate conversation.¹¹ We obtained ethical approval for our study from research ethics boards at the University of Toronto and the AI.

Recruitment

Participants were recruited from the AI in Toronto, Canada, which offers a variety of 30- to 45-minute exercise classes including aerobic, step, yoga, meditation, gentle stretching and weight training. Classes of 9–10 adults are supervised by one instructor, who modifies exercises based on the functional abilities of participants. In addition to exercise classes, the AI offers other programmes such as conversation groups, music, cooking, and painting.

We posted recruitment flyers at the AI, conducted a 15-minute presentation, and provided an information booklet outlining the study purpose, interview procedure, eligibility criteria, and potential study risks and benefits to all interested members of the AI. Acceptance as an AI member requires a referral and assessment by an SLP; members pay a flat fee each term based on individual ability to pay, which allows people to participate in as many programmes as they wish. AI members were eligible to participate in the study if they had post-stroke aphasia, were fluent in English before their stroke, and were able to provide informed consent to participate in the study. Participants were not excluded based on their level or type of aphasia. Prior to the interview, participants provided written informed consent.

While no universal definition of aphasia levels exists, the three categories used to describe participants' level of aphasia—mild, moderate, and severe—were adapted from those used by the American Speech-Language-Hearing Association. AI staff provided the severity level of each participant's aphasia. Participants were characterized as having *mild aphasia* if they could carry on normal conversations in many settings, sometimes had difficulty understanding complex language, and sometimes had difficulty in expressing an idea or feeling. A person categorized as having *moderate aphasia* would have more pronounced difficulties in understanding and expressing him- or herself but would still often be able to do so with support. Those with *severe aphasia* would have significant difficulty in understanding what is said to them, might say little or nothing at all, and might only use phrases such as “yes,” “no,” and “hi.”¹³ All participants had the option of working with a communication partner during the recruitment and interview process.

Data collection

We conducted in-depth, semi-structured face-to-face interviews using SCA.¹¹ An interviewer, the participant, and a note-taker were present at the interviews; when the participant requested a communication partner, he or she was also in attendance. Communication partners were volunteers from the AI, experienced in SCA but unknown to participants.

We asked participants about their pre-stroke activity (type, time, and environment) and how they accessed and participated in community-based exercise programmes post stroke (AI, stroke-specific, general, or other). Lastly, we asked participants to identify strategies that might enhance their exercise experiences.

We used an aphasia-friendly interview guide consisting of pictographs and written words, developed in coordination with an artist from the AI, to enable participants with moderate to severe aphasia to communicate effectively (see Appendix 1 online). Interviews were audio-recorded and later transcribed verbatim. The interviewer collected participant characteristics—including gender,

age, education level, ethnicity, living situation, number of years post stroke, and number of strokes—using SCA.

Participant interviews were 40 to 80 minutes in duration. In addition to identifying nonverbal cues, the note-taker provided prompts and clarifying statements to help facilitate the interview process. Three of the 10 participants requested a communication partner. When necessary, the partner implemented SCA, including emphasis of key terms and verification of the intended message. To fully represent the participants' perspective in the results, we used a combination of quotations and field notes to describe participants' responses. Use of the aphasia-friendly interview guide varied depending on aphasia level; participants with moderate and severe aphasia were more reliant on the guide. When necessary, we provided closed-ended probing questions for some participants.

Data analysis

The interviewer verified all verbatim transcripts for accuracy. The first transcript was coded by all members of the research team, working independently, using line-by-line conventional content analysis.¹⁴

After coding the first transcript individually, we met to discuss emerging themes and to develop a draft coding scheme for subsequent analyses. Two researchers individually coded the remaining nine transcripts. After coding each transcript, the two researchers met to compare codes and complete the coding scheme. Codes were clustered into meaningful categories based on recurrent patterns that arose from the data. Following the coding of the fifth and tenth transcripts, the research team met to review the codes and finalize the emerging themes.

RESULTS

Participants

A total of 10 adults with mild (40%), moderate (40%), or severe (20%) aphasia participated in the study. The majority of participants were Caucasian (70%) men (60%) and were between 60 and 69 years of age (40%). All participants were trained in SCA. Table 1 summarizes pertinent characteristics of the study participants.

Participants described their pre-stroke activity levels as not active (40%), moderately active (30%), or very active (30%); they mentioned engaging in pre-stroke activities such as jogging, biking, swimming, and going to the gym. Participants also reported attending a range of exercise programmes following their stroke. They often engaged in more than one type of exercise programme: AI group exercise programmes (90%); stroke-specific group exercise programmes such as Baycrest Wagman Centre's Moving On after Stroke (MOST) or North Toronto Memorial Community Centre's Together in Movement and Exercise (TIME) (20%); general community-based exercise programmes (40%); and independent exercise (40%). Of the four participants who exercised independently, one

Table 1 Characteristics of Participants ($n = 10$)

Characteristics	No. (%) of participants*
Age, y	
50–59	3 (30)
60–69	4 (40)
≥70	3 (30)
Highest level of education	
High school	2 (20)
Post-secondary	8 (80)
Ethnicity	
Caucasian	7 (70)
Asian	1 (10)
South Asian	2 (20)
Pre-stroke self-defined activity level	
Not active	4 (40)
Moderately active	3 (30)
Very active	3 (30)
Living alone	
Yes	3 (30)
Type of exercise programme accessed†	
AI	9 (90)
Stroke-specific	2 (20)
General	4 (40)
Independent	4 (40)
Accessed SLP services	
Yes	8 (80)
Number of years post-stroke, median (IQR)	3 (2–5)
Number of strokes, median (IQR)	1 (1–2)

*Unless otherwise indicated.

†Some participants accessed more than one type of exercise programme.

AI = Aphasia Institute; SLP = speech-language pathology; IQR = inter-quartile range.

had not attended any community exercise programmes and said, “I didn't have to go to a gym to do. I could do it myself” (P7, moderate aphasia). The most frequently cited types of independent exercise were walking and swimming. Participants commonly reported that a referral to the AI was facilitated by a health care practitioner (e.g., physical therapist) when they completed their in-patient rehabilitation programme.

The impact of aphasia

When asked to reflect on the impact of aphasia and experiences with exercise, many participants discussed the consequences not only of communication impairments but also of physical limitations: “Re-start different for me. Start this, start I cannot talk. I cannot pee. It's ... everything is ... ya restart everything. Zero zero zero” (P1, moderate aphasia).

Participants reported that in the early stages of their aphasia, they experienced fear and embarrassment when attempting to become more engaged in community activities, including exercise programmes: “In the beginning uhh when I came here I was scared. Maybe I was feeling everybody's looking at me” (P6, mild aphasia). Despite initial challenges, however, participants described

Box 1 Facilitators of Access to and Participation in Community-Based Exercise Programmes for Adults with Post-stroke Aphasia

Communication-related facilitators

- Guidance during exercise programme
 - One-on-one attention and modification of exercises to fit individual needs
- Use of nonverbal communication
 - Exercise instructor's use of exercise demonstration and gestures
- Patience
 - Willingness of adults without aphasia (e.g., exercise instructor) to work through communication issues (e.g., by providing extra time)
- Clear, simple instructions

Environmental facilitators

- Aphasia-specific programming for exercise
 - Staff understanding of aphasia
- Fostering sense of community
 - Presence of other individuals with similar experiences
- Presence of communication partner and family support
 - Assistance with scheduling transportation
 - Communication assistance when seeking information about programmes
 - Physical assistance (e.g., filling out registration forms)
- Staff consistency
 - Programme staff familiarity with participants' physical and/or communication challenges
- Multiple exercise instructors
 - Provides visual cues during exercise
- Transportation
 - Close proximity of exercise programme
 - Low cost of public transportation
- Routine
 - Consistent, scheduled exercise programme times and class format

Personal facilitators

- Motivation to exercise
- High value or importance placed on exercise

a process of gradual recovery in function and communication ability: "Slowly, at least slowly start better and better" (P1, moderate aphasia).

Facilitators and barriers

While our interviews focused specifically on communication-related facilitators and barriers, participants also reported environmental and personal factors that influenced their access to and participation in exercise. Because it was difficult to identify the specific exercise programme on which participants were basing their reports, the facilitators and barriers presented below reflect a combination of programmes (see Boxes 1 and 2).

Communication-related facilitators

Communication-related facilitators reported by adults with aphasia in the context of an exercise programme included offering guidance during exercise programmes; using nonverbal communication; patience; and providing clear, simple instructions (see Box 1). The latter three strategies were the most commonly identified facilitators. Strategies such as demonstrations, gestures, and reference points from the exercise instructor facilitated participation in exercise; this visual support in addition

Box 2 Barriers to Accessing and Participating in Community-Based Exercise Programmes for Adults with Post-stroke Aphasia

Communication-related barriers

- Exercise instructor speaking too quickly
- Impatience
 - Adults without aphasia unwilling to take extra time to communicate

Environmental barriers

- Lack of general public awareness of aphasia
 - Adults without aphasia unaware of strategies to enhance communication
- No communication partner or family support
 - Difficulty in joining exercise programme without help
 - Inability to attend exercise facility if no support person is available to provide assistance
- Lack of knowledge of exercise programme locations
- High exercise programme costs
- Transportation
 - Long travel times; lack of reliable public transit

Personal barriers

- Frustration
 - Feelings of anger and frustration make verbal communication more difficult
- Physical impairments and activity limitations

to auditory cues allowed participants to mirror the instructor's actions:

Verbal communication is good but sometimes you don't catch ... You know it's nice to see the person in front of you doing that ... that ... that way or that way with your ... uh to see what they're doing so that you can see, you can follow ... If I don't see the person or what she or he's doing, I'm totally lost. (P2, mild aphasia)

Patience was another communication facilitator reported by the majority of participants, who found it helpful when staff were understanding and willing to provide extra time for communication:

Interviewer (I): Is there anything that they did to make it easier for you to communicate?

Participant (P): I guess they didn't rush me. (P3, mild aphasia)

A facilitator repeatedly mentioned by participants was the use of simple and clear instructions. Participants reported difficulty in following commands when directions were lengthy:

P: Ya. But but if you tell one word, I I can uh uh lis I can listen to the word a lot easier than if I have to read uh 1, 2, 3, 4, 5, 6. 6 words it's it's it's more difficult because it's more longer. (P7, moderate aphasia)

Environmental facilitators

Environmental facilitators reported to enhance access to and participation in exercise included aphasia-specific programming for exercise, a sense of community, the presence of a communication partner and family support, consistent staff, extra exercise instructors, transportation,

and routine (see Box 1). Participants noted that having a communication partner or family support facilitated access to an exercise programme and assisted with knowledge translation:

I: Um, did you do anything on your own to make it easier to join exercise programmes? So for example, did a family member go with you to the exercise programmes? Yes or no?

[Field note: Participant nods yes]

I: Yes. So family member made it easier for you to go to exercise?

[Field note: participant provided a nonverbal cue to signify yes] (P4, severe aphasia)

Participants also reported that a support person such as a family member was important for providing or organizing transportation to exercise programmes. A communication partner or family member also helped with physical tasks such as filling out registration forms:

P: If we went to a new programme ummm I think I would take him.

I: So you would like your husband by you to help you with learning the new environment?

P: Yeah.

I: Not so much to assist you with the communication or instructions or anything?

P: No, he would help me write out everything [on the registration form]. (P3, mild aphasia)

Personal facilitators

Participants identified motivation to exercise and value placed on exercise as personal facilitators (see Box 1). Many participants considered exercise an important aspect of post-stroke rehabilitation:

P: Yes, ya, no, one umm ... exercise good, fitness good, good, my umm ... good, ya good. (P5, severe aphasia)

Communication-related barriers

Communication-related barriers reported by participants included impatience and the exercise instructor speaking too quickly (see Box 2). The most commonly identified barrier to accessing and participating in exercise programmes was staff impatience, which participants reported as feeling rushed:

I: Have you ever tried to access exercise programmes in your community?

P: Umm, I, I, I did but umm, I didn't follow through with it.

I: Were there reasons that you didn't follow through, is there something that made it difficult?

P: Well, I didn't like the person who answered. He told, he told, he hung up, he didn't have time. He didn't know me so ...

I: So he made it difficult for you?

P: Yes.

I: So he didn't have patience?

P: Ya. (P8, mild aphasia)

Environmental barriers

Environmental barriers identified by participants included lack of general public awareness about aphasia, having no communication partner or family support available, lack of knowledge of exercise programme locations, high exercise programme costs, and transportation challenges (see Box 2). Lack of general public awareness about aphasia was commonly reported by participants who attempted to join exercise facilities outside of the AI:

I: Do you think that when you explain to someone that you have aphasia that they know what it is?

P: I don't know. I don't think they do. I think they understand stroke but they don't understand uh things like that.

I: They don't understand aphasia?

P: They understand stroke very well, but they don't understand aphasia. (P7, moderate aphasia)

Personal barriers

Personal barriers identified by participants included frustration, physical impairments, and activity limitations (see Box 2). Although our interview questions were intended to capture communication-related barriers to accessing and participating in exercise, many participants emphasized physical impairments as primary barriers. Limitations in physical function, such as stroke-related paresis and decreased mobility, made accessing facilities difficult:

I: So ... why are you not attending programmes in the community?

P: No more, no more.

I: How come you don't attend anymore?

P: No more, uh, uh, no more, uh, uh, no more ... leg.

I: No more function?

P: Ya, ya. (P5, severe aphasia)

One participant, when accessing new environments, was less concerned with communication accessibility and more conscious of whether facilities could accommodate physical impairments:

Note-taker (I2): So if you went to a new place, like if you were to start a new programme somewhere else, what kind of things might you worry about or be concerned about when you first go? Like when you are just joining a programme.

P: Like if I can get into the washroom.

I2: Okay.

P: Ummm if they have handicapped toilets.

I2: Yep, is there anything specific to the communication part?

P: No. (P3, mild aphasia)

Box 3 Strategies to Improve Access to or Participation in Community-Based Exercise Programmes for Adults with Post-stroke Aphasia

Programme-level strategies

Exercise programming

- Advertise to enhance awareness of exercise programmes for adults with aphasia
- Improve availability of accessible exercise programmes
- Enhance public awareness of aphasia
- Build exercise programmes that accommodate participants with physical and communication-related disabilities

Individual-level strategies

Strategies for adults with aphasia

- Go with someone to the exercise programmes
- Take your time and go slowly when communicating with others
- Repeat yourself to help convey your message
- Make people aware that you have aphasia
- Use supported conversation strategies
- Ask questions or ask for help
- Use facial expressions to relay your message
- Start talking immediately after stroke to practise communication

Strategies for adults without aphasia

- Keep the conversation simple
- For health care professionals: provide more information about stroke and aphasia in the acute phase after stroke

Strategies to enhance access to and participation in community-based exercise

Many participants suggested strategies to help improve access to or participation in exercise (see Box 3). We divided these suggestions into two categories: programme-level and individual-level strategies. The former aimed at enhancing programming, while the latter were directed toward individual adults both with and without aphasia.

One suggestion that emerged at the programme level was to provide better advertising for programmes outside of the AI: "Advertise them . . . if we were aware of it, then we would go" (P2, mild aphasia). Participants also suggested that adults with aphasia should make others aware that they have aphasia: "I well. I try to tell the people that I had a stroke. And or or aphasia" (P7, moderate aphasia). Finally, they themselves should slow down and take their time when communicating:

I: I know earlier you were saying that when you are trying to speak to somebody you try to . . .

P: Ye ye.

I: Take your time?

P: Ye yes yes.

I: Go slow?

P: Yes yes ve very slow that it ve very okay. It's go good good you know. Ya take my time. Oh. Take my yes yes. (P10, moderate aphasia)

Finally, a strategy suggested for adults without aphasia when interacting with adults with aphasia was to keep the conversation simple: "Do something simple and don't very confuse with uh difficult words because they they don't get uh, they don't understand" (P7, moderate aphasia).

DISCUSSION

To our knowledge, this is the first study to thoroughly explore the experiences of adults with post-stroke aphasia engaging in community-based exercise programmes. Our findings reveal a combination of communication-related, environmental, and personal facilitators of and barriers to exercise (see Boxes 1 and 2). We have also identified programme- and individual-level strategies to improve access to and participation in community-based exercise programmes for adults with aphasia (see Box 3).

Although people with stroke experience participation restrictions in general, those with post-stroke aphasia are particularly vulnerable because of the additional challenges associated with their communication impairment.^{10,15} Participation in community-based exercise programmes is an important aspect of community reintegration for adults with aphasia, who already experience reduced social participation and restricted involvement in community activities.^{4,9,10} We found, however, that only a few of our study participants had accessed exercise programmes outside of the AI, and those who did so attended only one exercise programme at a time. This finding may be related to their participation in the AI's aphasia-friendly programming, which offers an extensive support network of peers and staff members.

Participants' outlook on aphasia and exercise participation appears to have changed as they progressed through their rehabilitation process. Participants reported that at the onset of aphasia, they felt embarrassed and fearful about how others would perceive them. Law and colleagues (2009) also reported a sense of stigmatization among adults with aphasia, which may contribute to delayed participation in exercise.⁴ Increasing awareness among community-based exercise programme providers (of potential communication facilitators and barriers) could also help to promote a sense of inclusion and socialization for adults with aphasia, especially in the early phases of rehabilitation.⁷

All participants, regardless of aphasia level or time elapsed since stroke, reported barriers to accessing and participating in exercise programmes. This finding highlights the importance of using strategies to enhance communication accessibility and the need for health care professionals to develop skills to accommodate adults with aphasia. Incorporating experiential aphasia education into rehabilitation professional curricula may help promote early awareness of aphasia and enhance opportunities to facilitate participation in exercise for people with post-stroke aphasia.

Participants reflected on their experience with aphasia and exercise as a whole, rather than focusing on the impact of communication alone. They also had difficulty in articulating differences between accessing and participating in exercise programmes, although where possible we attempted to differentiate between the two. Our analysis revealed that communication impairments made

joining an exercise programme difficult but were less commonly reported as a barrier to ongoing participation. Discussions of barriers to participation revolved around physical disability, which may be because there is less reliance on verbal communication in the exercise environment or may reflect the effectiveness of the SCA strategies used by members of the AI.

Communication-related factors

Although social participation can be affected by communication impairment, participants reported minimal difficulty in engaging in exercise.^{10,16} This may be because exercise is less reliant on auditory cues than other activities: just as graphics can be helpful when conversing with adults with aphasia, gestures and demonstrations provide a visual of the desired exercise activity, offering a more concrete and tangible communication aid.¹⁷ Although more complex verbal transactions may be necessary in other environments, such as banks and grocery stores,¹⁸ exercise settings often use instructions that are inherently nonverbal, which encourages ongoing participation.

Our study, like previous studies,^{18,19} identified the degree of patience exhibited by others during interactions with adults with aphasia as an important communication factor. Howe and colleagues^{18,19} found that adults with aphasia who perceived others as impatient became uncomfortable and self-conscious. Such experiences may discourage adults with aphasia from accessing and participating in community programmes that are not adapted to be aphasia friendly; on the other hand, exercise staff who understand the communication needs of adults with aphasia may allow more time for interactions, and thus empower participants.

Environmental factors

Lack of awareness of aphasia among the general public has been reported as a common barrier, as it engenders feelings of incompetence among adults with aphasia.²⁰ Reflecting findings on social participation in the literature,²⁰ our analysis indicates that, regardless of aphasia severity, the presence of a communication partner was critical in facilitating access to community-based exercise programmes for our participants, although it was less important to ongoing exercise participation. Thus enhancing access to community-based exercise programmes that serve a stroke population requires training staff in SCA.

Personal factors

Participants often focused on physical impairments (e.g., paresis, decreased mobility) rather than on communication limitations—perhaps because supportive AI programming is tailored toward adults with aphasia, mitigating potential communication barriers, or perhaps because of the profound impact of post-stroke physical limitations on their ability to exercise. This finding highlights the importance of recognizing both communicative

and physical impairments when developing aphasia-friendly community-based exercise programmes.

Participants outlined several strategies to enhance access to and participation in exercise. Previous studies used trained communication partners and SCA to improve communication for people with aphasia in other social contexts;^{12,21} our findings support the use of these strategies in the context of community exercise and also indicate a need for enhanced public awareness of aphasia (see Box 3). Public knowledge about aphasia is limited,²² and strategies such as taking extra time, using SCA, and using specific facial expressions are seldom employed when communicating with people with aphasia (see Box 3). Improving access to general community-based exercise programmes may increase exercise participation for adults with aphasia.

Barriers and facilitators identified in this study may not be unique to individuals with post-stroke aphasia; some of our findings may also apply to other community-dwelling adults, such as people with stroke, spinal-cord injury, or other complex medical conditions. However, it is important to keep in mind that people with aphasia have additional challenges related to communication, beyond their possible physical limitations.

Limitations

Our study has several limitations. First, for participants with severe aphasia, we relied heavily on nonverbal communication (e.g., head nods), field notes, interview booklets, and our own interpretations to understand the participants' messages. To mitigate this potential source of error, we incorporated steps to ensure the trustworthiness of the data we collected, such as having two interviewers present for each interview, transcribing interviews verbatim, having a second researcher review transcripts for accuracy, and having two researchers code each transcript. Second, while our interview guide consisted of open-ended questions, we frequently employed more closed-ended questions when interviewing participants with severe aphasia, which may have influenced their responses. Third, some participants with moderate to severe aphasia occasionally had difficulty in distinguishing between “yes” and “no” when answering questions. Using video-recording might have helped us to capture additional forms of nonverbal communication that audio-recording and field notes missed.^{10,17} Despite these challenges, including adults with severe aphasia, who historically have been excluded from study participation,^{15,16,23} enhances the applicability of our findings to the broader aphasia population. Finally, all participants in our study were members of the AI who had received education in SCA, which may explain why they did not report communication as a major barrier to participating in exercise programmes. The impact of communication-related barriers to exercise among the larger aphasia population,

who do not have access to aphasia-specific programming, requires further study.

Future directions

Future research should explore the experiences of adults with aphasia in the broader community who are not AI members and are not trained in SCA. Experiences may differ among people who access and participate in varying types of community-based exercise programmes across regions. A more comprehensive understanding of barriers and facilitators in rural areas, where community-based exercise programmes may be more limited and less accessible, would also be useful. Future research could also include a qualitative study exploring the perspective of the providers who deliver programmes for people with aphasia, to gain insights about what services may be feasible to implement in community programmes.

CONCLUSION

Our study provides insight into the experiences of adults with post-stroke aphasia who try to access and participate in community-based exercise programmes. Participants identified a combination of communication-related, environmental, and personal facilitators of and barriers to accessing and participating in community-based exercise programmes. Programme- and individual-level strategies can be implemented to create inclusive, aphasia-friendly exercise environments that recognize the importance of both communicative and physical accessibility. Our findings can inform programming to optimize access to and participation in community-based exercise programmes for adults with post-stroke aphasia.

KEY MESSAGES

What is already known on this topic

People with post-stroke aphasia can experience barriers to social participation that may influence their participation in community-based exercise.

What this study adds

Adults with post-stroke aphasia in our study experienced a combination of communication, environmental, and personal facilitators and barriers to accessing and participating in community-based exercise programmes that may help to inform exercise programming for adults with aphasia. Providers of community-based exercise programmes, including physical therapists, can use programme- and individual-level strategies to enhance communicative accessibility for adults with aphasia. Using nonverbal communication, providing more time during interactions, and using a communication partner may positively influence the exercise experience.

REFERENCES

1. Public Health Agency of Canada. Tracking heart disease and stroke in Canada, 2009. Ottawa: The Agency; 2009.
2. National Institute of Neurological Disorders and Stroke [NINDS]. NINDS aphasia information page [Internet]. Bethesda (MD): The Institute; 2012 [updated 2012 Jul 9; cited 2013 Aug]. Available from: www.ninds.nih.gov/disorders/aphasia/aphasia.htm.
3. Dickey L, Kagan A, Lindsay MP, et al. Incidence and profile of inpatient stroke-induced aphasia in Ontario, Canada. *Arch Phys Med Rehabil*. 2010;91(2):196–202. <http://dx.doi.org/10.1016/j.apmr.2009.09.020>. Medline:20159121
4. Law J, Huby G, Irving AM, et al. Reconciling the perspective of practitioner and service user: findings from the Aphasia in Scotland study. *Int J Lang Commun Disord*. 2010;45(5):551–60. <http://dx.doi.org/10.3109/13682820903308509>. Medline:19886848
5. Boysen G, Krarup LH. Benefits of physical activity for stroke survivors. *Expert Rev Neurother*. 2009;9(2):147–9. <http://dx.doi.org/10.1586/14737175.9.2.147>. Medline:19210189
6. Morris JH, Williams B. Optimising long-term participation in physical activities after stroke: exploring new ways of working for physiotherapists. *Physiotherapy*. 2009;95(3):227–33. <http://dx.doi.org/10.1016/j.physio.2008.11.006>. Medline:19635344
7. Morris J, Oliver T, Kroll T, et al. The importance of psychological and social factors in influencing the uptake and maintenance of physical activity after stroke: a structured review of the empirical literature. *Stroke Res Treat*. 2012;2012:art. 195249. <http://dx.doi.org/10.1155/2012/195249>. Medline:21918730
8. Rimmer JH, Wang E, Smith D. Barriers associated with exercise and community access for individuals with stroke. *J Rehabil Res Dev*. 2008;45(2):315–22. <http://dx.doi.org/10.1682/JRRD.2007.02.0042>. Medline:18566948
9. Dalemans RJ, de Witte L, Wade D, et al. Social participation through the eyes of people with aphasia. *Int J Lang Commun Disord*. 2010;45(5):537–50. <http://dx.doi.org/10.3109/13682820903223633>. Medline:19839875
10. Wallace GL. Profile of life participation after stroke and aphasia. *Top Stroke Rehabil*. 2010;17(6):432–50. <http://dx.doi.org/10.1310/tsr1706-432>. Medline:21239367
11. Kagan A. Supported Conversation for Adults with Aphasia: methods and resources for training conversation partners. *Aphasiology*. 1998;12(9):816–30. <http://dx.doi.org/10.1080/02687039808249575>
12. Kagan A, Black SE, Duchan FJ, et al. Training volunteers as conversation partners using “Supported Conversation for Adults with Aphasia” (SCA): a controlled trial. *J Speech Lang Hear Res*. 2001;44(3):624–38. [http://dx.doi.org/10.1044/1092-4388\(2001/051\)](http://dx.doi.org/10.1044/1092-4388(2001/051)). Medline:11407567
13. American Speech-Language Hearing Association [ASHA]. Aphasia [Internet]. Rockville (MD): The Association; c2014 [cited 2014 Jan 9]. Available from: <http://www.asha.org/public/speech/disorders/aphasia.htm>.
14. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277–88. <http://dx.doi.org/10.1177/1049732305276687>. Medline:16204405
15. Dalemans R, Wade DT, van den Heuvel WJ, et al. Facilitating the participation of people with aphasia in research: a description of strategies. *Clin Rehabil*. 2009;23(10):948–59. <http://dx.doi.org/10.1177/0269215509337197>. Medline:19570814
16. Worrall L, Rose T, Howe T, et al. Developing an evidence-base for accessibility for people with aphasia. *Aphasiology*. 2007;21(1):124–36. <http://dx.doi.org/10.1080/02687030600798352>
17. Garrett KL, Huth C. The impact of graphic contextual information and instruction on the conversational behaviours of a person with severe aphasia. *Aphasiology*. 2002;16(4–6):523–36. <http://dx.doi.org/10.1080/02687030244000149>
18. Howe TJ, Worrall LE, Hickson LMH. Observing people with aphasia: Environmental factors that influence their community participation. *Aphasiology*. 2008;22(6):618–43. <http://dx.doi.org/10.1080/02687030701536024>

19. Howe TJ, Worrall LE, Hickson LMH. Interviews with people with aphasia: environmental factors that influence their community participation. *Aphasiology*. 2008;22(10):1092–120. <http://dx.doi.org/10.1080/02687030701640941>
20. Simmons-Mackie N, Raymer A, Armstrong E, et al. Communication partner training in aphasia: a systematic review. *Arch Phys Med Rehabil*. 2010;91(12):1814–37. <http://dx.doi.org/10.1016/j.apmr.2010.08.026>. Medline:21112422
21. Simmons-Mackie NN, Kagan A, O'Neill Christie C, et al. Communicative access and decision making for people with aphasia: implementing sustainable healthcare systems change. *Aphasiology*. 2007;21(1):39–66. <http://dx.doi.org/10.1080/02687030600798287>
22. Flynn L, Cumberland A, Marshall J. Public knowledge about aphasia: a survey with comparative data. *Aphasiology*. 2009;23(3):393–401. <http://dx.doi.org/10.1080/02687030701828942>
23. Ashton C, Aziz NA, Barwood C, et al. Communicatively accessible public transport for people with aphasia: A pilot study. *Aphasiology*. 2008;22(3):305–20. <http://dx.doi.org/10.1080/02687030701382841>