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To cite this article: Valeria Chiu, Beth E. Fields, Yen-Nung Lin, Jiunn-Horng Kang, Der-Sheng Han, Yi-Hsuan Wu, Yu Su, Elizabeth R. Skidmore & Feng-Hang Chang (2023): Implementing strategy training in Taiwan: perspectives of individuals with Acquired brain injury, *Disability and Rehabilitation*, DOI: [10.1080/09638288.2023.2191013](https://doi.org/10.1080/09638288.2023.2191013)

To link to this article: <https://doi.org/10.1080/09638288.2023.2191013>

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Implementing strategy training in Taiwan: perspectives of individuals with Acquired brain injury

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ABSTRACT

Purpose: Strategy training is a rehabilitation intervention that aims to enhance problem-solving skills with respect to daily activity-related challenges and has achieved favorable results in Western countries. This study explored the perspectives of individuals with acquired brain injury (ABI) in Taiwan who received strategy training.

Materials and methods: Semi-structured interviews with community-dwelling adults with ABI were conducted, and reflective memos made by research team members were recorded. Interviews and memos were analyzed through thematic analysis

Results: This study included 55 participants. The analysis of the participants' interview responses and memos yielded nine themes under three categories: 1) expectations regarding strategy training, 2) perceived benefits of strategy training, and 3) barriers affecting the process and outcomes of strategy training.

Conclusions: All the participants endorsed strategy training through different gains. Most participants' expectations before the intervention were uncertain. Including family members into the strategy training is of key importance for a successfulness of their goals. The participants' experiences about strategy training were affected by various barriers (i.e., health and medical problems, the physical environment, and natural events). Clinicians and researchers should consider these expectations, benefits, and barriers when studying and implementing strategy training in non-Western contexts.

> IMPLICATIONS FOR REHABILITATION

- Strategy training provides clients the opportunity to actively engage in their own goal setting and decision making.
- Strategy training increases the client's confidence in their ability to participate in the community, communicate, and perform daily living and physical activities.
- Therapists should consider the health conditions and physical environment of clients when helping them set goals and before facilitating their engagement in the community.
- Taiwanese family members play a crucial role in supporting acquired brain injury survivors in strategy training.

ARTICLE HISTORY

Received 29 July 2022
Revised 7 March 2023
Accepted 9 March 2023

KEYWORDS

Qualitative research;
stroke;
brain injury;
rehabilitation;
strategy training;
community participation;
social participation

Introduction

Acquired brain injury (ABI) [1] is a leading cause of life-long disability [2] and commonly results in cognitive impairments, including a lack of self-awareness, self-regulation, and self-monitoring [3,4]. These cognitive impairments often persist over time and considerably limit an individual's performance with respect to daily activities and social participation [5,6]. The adverse effects of post-ABI cognitive impairments result in substantial health-care expenditures and a considerable financial burden for families and

society [7,8]. Therefore, rehabilitation interventions must be implemented to minimize the disability of individuals with post-ABI cognitive impairments.

Strategy training is an intervention designed to help clients identify challenges in their daily lives and develop their own strategies to address these challenges [9]. Through prompts and questions, a therapist guides a client through the process of learning a global strategy, which involves setting a goal, developing a plan, implementing the plan, and evaluating one's performance [10]. During training, clients can practice this global strategy

iteratively and subsequently apply it to the various challenges encountered in their daily lives [11].

Numerous studies have examined the efficacy of strategy training in individuals with ABI [9,12,13] and have demonstrated its favorable effects on long-term functional independence [9], participation [12,14], cognitive flexibility [15], and self-awareness [16]. Dawson et al. [12] conducted a pilot study with promising effect of strategy training on improving functional independence, which is reflected on an improvement of more than 20 points on the Functional Independence Measure, significantly more than the score changes of the control group. The preliminary efficacy of strategy training on enhancing participation frequency and lessening participation difficulty in adults with ABI was also observed in a preliminary study [14]. An efficacy study discovered that adults with stroke-related cognitive impairments who underwent strategy training exhibited significant improvements in cognitive flexibility and the ability to alter their behaviors in response to various circumstances [15].

Most research on strategy training has employed quantitative methods; by contrast, few qualitative studies have explored the subjective experiences of clients and therapists involved in strategy training interventions. A qualitative study conducted in Canada reported that participants with chronic stroke could apply the strategies that they learned during the intervention, and that they experienced improvements in various areas (i.e., increased autonomy, sense of responsibility, self-attribution of success, confidence, and the desire to challenge themselves by setting goals that would have been unfeasible or disallowed through conventional rehabilitation training) [17]. These findings regarding the perceived advantages of client empowerment, improvements in client engagement, and the generalization skills associated with strategy training are similar to those of another qualitative study, in which the perspectives of therapists from Western and Asian countries were compared [18]. In this rapid ethnographic study, cultural differences between therapists from the United States and Taiwan were identified in terms of conventional rehabilitation practices, the challenges encountered during the early stages of strategy training, and the role of family members during strategy training [18]. These two qualitative studies exemplify the importance of clients and therapists' perspectives and bring attention to active ingredients for successful intervention implementation and sustainability [19]. Although these two studies allude to some potential cultural differences, no study, to the best of our knowledge, has explored the strategy training experiences of clients in non-Western countries. This constitutes a research gap because the cultural context strongly affects clients' expectations and perceptions of interventions, thereby affecting various outcomes [18,20]. To address this gap, the present study extended findings from the ethnographic study by exploring the expectations, experiences, and perspectives of individuals with ABI in Taiwan who underwent strategy training. The findings of the present study contribute to the limited qualitative evidence pertaining to strategy training, and they can be applied to enhance the adoption and implementation of strategy training for clients with ABI in rehabilitation settings in non-Western countries.

Methods

Design

The present study interviews participants of two clinical trials [14,21] that explored the feasibility and efficacy of strategy training for adults with cognitive impairments following ABI in Taiwan.

A qualitative descriptive approach [22,23] was adopted to characterize the perspectives and experiences of individuals with ABI regarding strategy training. The study protocol was approved by the ethical committees of Taipei Medical University and all the participating hospitals, including Taipei Medical University Hospital, Taipei Municipal Wanfang Hospital, and Shuang Ho Hospital, National Taiwan University Hospital and its Beihu Branch, and Taipei Tzu Chi Hospital (approval numbers: N201704046, N201804055, 201805079RINC, 201908020RINC, and 08-M-065). Written informed consent was obtained from all participants. The methodology and findings of this study comply with the Consolidated Criteria for Reporting Qualitative Research (COREQ; see [Supplementary Appendix 1](#)) [24].

Participants

Individuals with ABI who underwent strategy training in a feasibility study [14] or a randomized controlled study [21] were invited to participate in the qualitative interviews (conducted between August 2017 and November 2020) through one of two methods. The first was in-person invitations (by VC, YS, YNL, YHW, JHK, and DSH) that was extended when they visited the departments of physical medicine and rehabilitation of six academic medical centers (three were affiliated with Taipei Medical University, two with National Taiwan University, and one with Tzu Chi Medical Foundation) in the greater Taipei area; the second method was phone calls made by a research team member (YS).

Individuals were eligible if they were 20 years or older, had a confirmed diagnosis of stroke or traumatic brain injury (TBI), and had cognitive impairments (defined based on a score of ≥ 3 on the 14-item version of the Executive Interview scale [25]). Those with severe aphasia, a diagnosis of dementia or psychiatric disorders, or any condition that could have prevented them from participating in the study were excluded.

Data collection

Trained researchers (YS, VC, HWL, and YHH) collected demographic and clinical information and conducted interviews with the participants after they underwent strategy training (12–15 sessions). For each participant, we conducted a face-to-face interview that lasted approximately 60–90 min in a quiet room preferred by the participant (either at their home or a hospital). If the participant was accompanied by their family caregiver during the interview, the caregiver's comments were recorded to supplement the participant's responses. We continued data collection until data saturation was reached [26], that is, the point at which no further codes and themes could be identified from the data.

To achieve the purpose of the present study, we developed an interview guide that comprised a series of open-ended questions (see [Supplementary Appendix 2](#)), including "What were the goals you set for this intervention?" "Tell me about your experiences with strategy training?" and "What were the challenges that you encountered during strategy training?" In addition to the guide, trained researchers (YS, VC, and YHH) used probing techniques to elicit more discussions and made reflective memos following each interview. All the interviews were audio recorded, transcribed verbatim, and reviewed for congruence. An example of a reflective memo is provided in [Supplementary Appendix 3](#).

Data analysis

To determine the participants' experiences with strategy training, we performed thematic analysis [22]. First, two research team members (VC and YS) independently read each transcript to obtain a general overview of the interviews. Subsequently, relevant statements in the transcribed text were highlighted and further abstracted and coded using NVivo 12 Pro (QSR International, Melbourne, Australia). Thereafter, the codes belonging to a given category were clustered into themes and given an inductive category name. All data with similar meanings were grouped, synthesized (into a description of a participant's personal experience), revised, compared, and discussed. The two research team members resolved discrepancies through consultation with other research team members (FHC and BEF). We analyzed the data until categorical saturation was reached; that is, the co-coders agreed that no new categories could be identified. The final coding results were translated into English, and their accuracy was reviewed by two bilingual team members (VC and FHC). The translated coding results were reviewed and discussed by the research team until a consensus was reached regarding the final textual-structural interpretation of the significance of the participants' experiences [27].

To enhance the credibility of the research team's interpretation of the results, we performed between-method triangulation [28] of the participants' demographic data, the interview content, and the reflective memos. We employed member checking to determine whether the identified themes aligned with the participants' perspectives [29].

Results

We recruited 55 participants (35 men and 20 women), none of whom refused to participate or withdrew from the present study. Table 1 presents the characteristics of the participants. The participants' median age was 62 years (range, 20–83 years). The median period following ABI onset was 17 months (range, 1–240 months). Regarding lesion type, 27.3%, 54.3%, and 18.2% of the participants had hemorrhagic stroke, ischemic stroke, and TBI, respectively. The participants' median Montreal Cognitive Assessment (MoCA) score was 21 (range, 4–30); they were

Table 1. Demographic characteristics of participants.

Characteristics (N=55)	Participants
Age, median (IQR), years	62.0 (50.0–68.0)
Sex % (n)	
Men	63.6% (35)
Women	36.4% (20)
Time since onset, median (IQR), months	17.0 (7.0–46.0)
Lesion type % (n)	
Hemorrhagic stroke	27.3% (15)
Ischemic stroke	54.3% (30)
TBI	18.2% (10)
Lesion side % (n)	
Left	47.3% (26)
Right	34.5% (19)
TBI	18.2% (10)
Cognitive impairment, median (IQR), MoCA score (0–30)	21.0 (18.0–25.0)
NIHSS (0–42), median (IQR)	7.0 (0.0–16.0)
MRS (0–6), median (IQR)	3.0 (1.0–5.0)
Education % (n)	
High school or lower	58.2% (32)
College or higher	41.8% (23)

TBI: traumatic brain injury; IQR: interquartile range; MoCA: Montreal Cognitive Assessment; NIHSS: National Institutes of Health Stroke Scale; MRS: Modified Rankin Scale.

classified as having mild cognitive impairment if they had a MoCA score of 24 or higher and having moderate/severe cognitive impairment if they had a MoCA score of <24 [30]. For the participants with stroke, their median Modified Rankin Scale score was 3 (range, 1–5), and their median National Institutes of Health Stroke Scale score was 7 (range, 0–16). For the participants with TBI, the median Rancho Los Amigos scale score was 6 (range, 5–8).

Experiences with strategy training

Before the participants underwent strategy training, most of them had uncertain expectations or expected the training to help them address ABI-related challenges. After the participants underwent strategy training, many experienced improvements in their self-efficacy, physical and cognitive functional abilities, and confidence in participating in meaningful activities. Nevertheless, the participants reported that they experienced several personal and environmental barriers to participating in strategy training in Taiwan, including health and medical problems, challenges related to the physical environment, and natural events. Overall, we identified several themes from the participants' interviews and reflective memos and classified them under three key categories: 1) expectations regarding strategy training, 2) perceived benefits of strategy training, and 3) barriers affecting the process and outcomes of strategy training. Table 2 provides an overview of the key themes and representative quotes identified through the interviews with the participants.

Expectations regarding strategy training

One theme that was identified pertained to the participants' expectations regarding the strategy training process, namely their familiarity with strategy training.

Prior to starting strategy training, most of the participants were unfamiliar with strategy training and had no or uncertain expectations regarding the training; they perceived strategy training as a novel and different intervention relative to conventional rehabilitation. A patient who had a hemorrhagic stroke 11 months ago with mild cognitive impairment stated that "Before the class, I didn't know what the therapist would teach me" (P006). Other participants described strategy training as a passive process in which someone provided directions and told them what to do (i.e., similar to conventional rehabilitation). A participant who had a hemorrhagic stroke 20 years ago with moderate cognitive impairment described that "I thought she (the therapist) would give the instructions, then I would follow the instructions and proceed with that..." (N002).

Some participants revealed that they anticipated conquering the challenges due to their stroke or traumatic brain lesion. A participant who had a hemorrhagic stroke 2 months ago with moderate cognitive impairment stated that "I became physically impaired, so I thought that maybe learning more of these things would allow me to overcome some barriers by myself" (W16). A participant who had an ischemic stroke 12 months ago with moderate cognitive impairment described that "Before the training, I had been told that the course would allow me to focus on things related to thinking, so I wanted to give it a try" (T019).

Perceived benefits of strategy training

The following themes are related to the perceived benefits of strategy training: 1) increased community and social participation, 2) increased capability to perform activities, 3) increased

Table 2. List of themes and subthemes identified from interviews with the participants.

Category	Theme	Representative quote
1. Expectations of strategy training	Familiarity with strategy training	<i>I didn't expect anything before, because I didn't attend to the classes before.</i>
2. Perceived benefits of strategy training	Increased community and social participation	<i>I go out more for walks, which are helpful for my body and mind. He was an old friend of mine from the past. We used to go mountain climbing together. So, I went up to find him and we talked a lot.</i>
	Increased capability to perform activities	<i>I cook everything by myself now. I mop the floor and do everything by myself now. Now I take stairs as much as possible instead of using the elevator to train myself to improve my physical strength.</i>
	Increased confidence	<i>I didn't know what was written before, but now when I look at those things, I understand more. Now I can do more things that I didn't dare to with more confidence. After my stroke, I never cooked again. This was the first time and I'm satisfied.</i>
	Increased cognitive function	<i>My memory improved, for example, what class am I going to have today, when to eat or drink, at least I don't forget now. My memory has improved. In the past, I only did the thing I thought of before, now I think about how I want to accomplish it.</i>
	Perceived social support	<i>We work together. Whatever she needs to do, I would help her if it were within my ability. I don't easily show my emotions in front of people, and he (therapist) respects me in this regard. In every class, he guided me to express my feelings.</i>
3. Barriers affecting the process and outcomes of strategy training	Health and medical problems	<i>Because of my leg problem, especially when I step on the beach or rocky ground, I still cannot walk.</i>
	Physical environment	<i>I had to watch out for vehicles and avoid getting hit by cars. Also, if the road was uneven, I had to be careful.</i>
	Natural events	<i>About returning to the workplace as previously mentioned, because of the COVID pandemic, it is unlikely now. Maybe I have to postpone the plan for a little longer.</i>

confidence, 4) increased cognitive function, and 5) acknowledgment of social support.

Theme 1: Increased community and social participation

The participants indicated that after strategy training, they could participate in numerous community activities that they wanted to attempt but never did, such as going to various places and events (e.g., market, temple, bank, wedding, and restaurant) and participating in various outdoor activities. Many of the participants did not believe that they could leave their apartment after their injury and were surprised by their performance. A participant who had an ischemic stroke 12 months ago with mild cognitive impairment stated that "It was an all-you-can-eat, self-service hotpot restaurant... I could consume more of the food that I liked to eat and less of those that I didn't like" (N001). Some participants even applied for a job or a volunteer position. For example, a participant who had a hemorrhagic stroke 20 years ago with moderate cognitive impairment described the following: "We first went to the hospital, asked the volunteer office, and went for the volunteer class" (N002).

The participants mentioned that strategy training created opportunities for them to engage in social activities in the community, such as gathering with old friends and making new friends. They enjoyed their increased participation in more social activities and felt less isolated. Some participants arranged a 2-day trip to Southern Taiwan to visit old friends; this activity included making room and restaurant reservations and booking bus and train tickets by themselves (memos by VC, January 31, 2021). A participant who had a hemorrhagic stroke 30 months ago with moderate cognitive impairment reported the following: "Visiting the park made me more cheerful. I tried not to be a hermit at home. I used to be quiet, and I didn't like meeting people. Now I meet two or three people every day" (T008).

Theme 2: Increased capability to perform activities

The participants reported that strategy training increased their ability to perform various activities, including daily activities (e.g.,

dressing, bathing, and cooking), physical activities (e.g., walking, biking, and hiking), and communication (e.g., talking to someone on a phone and expressing themselves).

Because of their injury, numerous participants experienced limitations in performing activities of daily living and were dependent on their caregivers. During strategy training, the participants were encouraged to explore their own abilities and apply them in real-life activities, through which they realized that they could perform various activities independently; this process increased their sense of empowerment and autonomy. Two patients reported the following:

"I collected and folded clothes to make myself feel more useful. I forced myself to walk to the bank and post office" (T008: a participant who had a hemorrhagic stroke 30 months ago with moderate cognitive impairment).

"Without pursuing these goals, I would have never thought that I could go to the market to buy things again. Because I didn't try it, I didn't know that I could actually do it" (S036: a participant who had an ischemic stroke 46 months ago with mild cognitive impairment).

Several participants felt that, during strategy training, their ability to perform physical activities was substantially and initially affected by their injury, especially when engaging in activities such as hiking, mountain climbing, and biking. However, by the end of the training, the participants realized that they could control their body movements during these physical activities. A participant who had an ischemic stroke 12 months ago with mild cognitive impairment stated that "Let's talk about jogging, for example, my mobility has indeed improved. I can control my joints better after training" (S014).

After strategy training, the participants felt that they could express their feelings and thoughts, communicate with their family members, read and write information quicker, understand reading materials better, and think more thoroughly before speaking. A participant who had an ischemic stroke 20 months ago with mild cognitive impairment stated the following: "I was not good at expressing my feelings, but the therapist encouraged me all the time and helped me to speak up. My communication skills have definitely improved" (S032).

Theme 3: Increased confidence

All the participants reported that their confidence substantially increased following strategy training. Most of the participants did not believe that they could perform various activities independently, and they indicated that they feared undertaking new tasks after the injury. After strategy training, these participants could overcome their fear and became more willing to attempt various tasks of their interest. A participant who had ischemic stroke 12 months ago with mild cognitive impairment stated: "I simply found an open area where there was no car, and I started practicing driving there. I went forward and then pulled over. I felt it was ok" (N001).

Several participants revealed that they became more confident about their physical and communication capabilities through successful experiences during strategy training and believed that they could attempt new tasks and solve more problems independently. Several participants with hemiplegia were unafraid of failure and drove an automobile or motorcycle with confidence and achieved favorable outcomes (memos by VC, January 31, 2021). Two patients reported the following:

"Now I can do with more confidence a lot more things that I previously didn't dare to do" (W19: a participant who had an ischemic stroke 22 months ago with mild cognitive impairment).

"When I encountered challenges, I didn't give up. I worked hard to solve the problems. I tried again and again until I succeeded" (T008: a participant who had a hemorrhagic stroke 30 months ago with moderate cognitive impairment).

Theme 4: Increased cognitive function

The participants emphasized that their cognitive functions, such as memory and executive functions, were enhanced after strategy training. Numerous participants indicated that their memory improved after performing and repeating a goal-plan-do-check process, during which they had to remember the goals and plans that were established during practice. A participant who had an ischemic stroke 55 months ago with moderate cognitive impairment described the following: "When I experienced it (strategy training), I needed to remember things, such as where I'm going next. I tried to remember landmarks or road signs. Now, I don't get lost when I go to my kid's house" (W17). Setting appropriate goals, planning, performing tasks, and mastering them are crucial for achieving goals. One participant stated that she felt embarrassed about her inability to recall other people's names, and to overcome this issue, she utilized various strategies to successfully achieve her goals (memos by VC, January 27, 2021).

The participants described that their executive functioning improved, including their problem-solving and planning skills. Several participants mentioned that they were unaccustomed to thinking ahead before performing an action, which led to various problems. Strategy training required the participants to develop plans and explore options for overcoming performance barriers; these processes enabled them to acquire planning and problem-solving skills and become more comfortable with overcoming life's challenges. A participant who had a hemorrhagic stroke 7 months ago with moderate cognitive impairment stated that "Before I do things, I think about them first. I plan for the risks that I will encounter, how to do it, and how to achieve it. Anyway, now I think more thoroughly before doing something" (W14).

Theme 5: Acknowledgment of social support

Almost all the participants acknowledged the importance of being supported by their family members and friends during strategy training. This social support increased their confidence and

willingness to achieve their goals, build strength, and overcome the challenges that they encountered. In addition, the participants felt less isolated and became more willing to participate in community activities. A participant who had a hemorrhagic stroke 2 months ago with moderate cognitive impairment reported that "If I participate in an activity, people do not necessarily reach out and offer help. But with my family and friends, I am unafraid. They are accepting and encouraging, so I am not afraid" (W16).

Several participants reported that they received considerable support from therapists during training. When the participants doubted their own abilities, their therapists helped them to review and learn from their experience and encouraged them to perform tasks. The therapists not only helped the participants to achieve their goals but also played a psychologically supportive role by providing the participants with positive feedback, which was crucial for the participants when they encountered difficulties in performing tasks (memos by VC, 24 January, 2021). Moreover, the participants shared that they regained their confidence and became more willing to attempt new tasks. A participant who had a hemorrhagic stroke 20 years ago with moderate cognitive impairment stated that "Because of the therapist's encouragement, I started to practice walking on a treadmill. Now I proactively do various things with more confidence" (N002).

During strategy training, the participants' family caregivers acquired knowledge and learned how to develop and implement a plan, evaluate performance, and apply their knowledge to similar problems when taking care of their loved ones. One family caregiver reported that "I began to understand that he (W14: a participant who had a hemorrhagic stroke 7 months ago with moderate cognitive impairment) was learning a method, a method that he could apply to whatever he wanted to do in the future... For me, what I have learned is a method that one can apply to other lifestyles" (W14's wife).

Barriers affecting process and outcomes of strategy training

These themes relate to the barriers affecting the process and outcomes of strategy training, namely 1) health and medical problems, 2) physical environment, and 3) natural events.

Theme 1: Health and medical problems

The participants described that health and medical conditions (e.g., fatigue, pain, joint stiffness, insufficient muscle strength and balance, hypertension, osteoarthritis, and dyspnea) reduced their motivation to set goals and implement plans. Numerous participants were determined to achieve their goals at the beginning of the training but subsequently experienced physical disability, tiredness, and depressive mood; thus, they could not perform physical activities on some days (memos by VC, January 31, 2021). A participant who had a hemorrhagic stroke 5 years ago with mild cognitive impairment stated the following: "Since I am not physically fit, I feel tired after a long walk. My legs are not fully recovered" (S009). A participant who had an ischemic stroke 4 years ago with mild cognitive impairment described that "I tried playing basketball but found it difficult to balance myself, and I fell... I tried to shoot the ball, but I couldn't balance well. I was afraid of getting myself in another accident, so I told the therapist that I wanted to put this on hold" (S036).

Theme 2: Physical environment

The participants frequently mentioned the physical environment as a crucial barrier. During strategy training, the participants were

required to perform activities at home or in the community, and they perceived that various environmental factors (e.g., stairs and roads) affected their performance. For example, the participants felt unsafe when they walked on uneven road surfaces or when their residential building was inaccessible to people with mobility limitations, preventing them from performing activities in their community. Transportation had a major effect on their community participation. Numerous participants were resistant to travel in the community when they were in traffic or when sidewalks or traffic lights were absent. A participant who had a hemorrhagic stroke 2.5 years ago with moderate cognitive impairment reported that “I had to watch out for vehicles and avoid getting hit by cars. Also, if the road was uneven, I had to be careful” (T008). These environmental factors not only affected the participants’ strategy training practice but also deterred them from performing more activities in the community.

Theme 3: Natural events

Numerous participants shared how the COVID-19 pandemic affected their strategy training participation and practice. The study period overlapped with the first wave of the COVID-19 pandemic in the winter of 2020, when hospitals announced various policies to reduce the spread of the virus, including the reorganization of hospital entrances and patient wards, the implementation of flow management, the imposition of mandatory face mask wearing in hospitals, the banning of symptomatic inbound passengers from using public transportation, the implementation of temperature checking in hospitals, and the implementation of public social distancing; these policies directly affected the participants’ willingness to go to public areas. The participants’ access to health care and community services and participation in work or volunteer activities were all limited by these policies. Moreover, the participants could not attend classes or travel according to their plans. A participant who had an ischemic stroke 9 months ago with moderate cognitive impairment described that “My first goal was to work as a volunteer at a hospital, and my second (goal) was going abroad. However, because of the COVID-19 pandemic, both goals could not be achieved” (S030).

Discussion

Because participants’ perspectives are crucial to the implementation and sustainability of successful interventions, the present study explored the expectations and experiences of individuals with ABI regarding strategy training in a non-Western country. Nine themes emerged from the analysis, namely familiarity with strategy training, increasing community and social participation, improving the capability to perform activities, increasing confidence, improving cognitive functioning, perceived social support, health and medical problems, physical environment, and natural events. These nine themes were classified under three key categories (expectations of strategy training, perceived benefits of strategy training, and barriers affecting the process and outcomes of strategy training). Our findings exhibit similarities to those of other studies on strategy training [17, 31].

Numerous participants reported uncertain expectations regarding strategy training prior to strategy training. This finding is unsurprising in the clinical context, in which clients are accustomed to being a passive recipient of health care. A cross-country ethnographic study conducted in Taiwan and the United States indicated that clients were accustomed to following instructions from health-care providers and rarely undertake an active role in

patient–provider relationships [18]. Because strategy training emphasizes client empowerment and engagement, clinicians and therapists must provide sufficient support to help their clients to better understand their training before the intervention and to encourage them to take a proactive role in decision-making.

The participants perceived that they benefited from strategy training; their confidence and self-efficacy increased, enabling them to perform activities of daily living and increasing their participation in their community. The participants’ perceived favorable outcomes can be explained by the self-determination process, which helped them focus on their implicit and unconscious desires [32]. Strategy training requires clients to set goals, make and execute plans, check their performance, and modify their goals or plans continually until they achieve their goals [15]. During a metacognitive process, clients obtain insights into their strengths and limitations and, accordingly, apply their own abilities effectively to solve problems [33]. These insights gradually develop into generic self-efficacy, which enables clients to adapt to new situations and enhance their performance in various situations [31]. Our study results provide key insights into how individuals with ABI can overcome the barriers encountered during training, and they can apply and transfer their acquired skills to their daily lives and increase their confidence to participate in the community. Future research should examine the role of self-efficacy in strategy training.

The participants in the present study perceived that their cognitive functioning (e.g., memory, problem-solving, and planning) was enhanced by strategy training. Although their perceptions are subjective individual experiences, the results are consistent with those of other studies, which suggest that strategy training leads to neurocognitive changes resulting from practicing everyday activities [34]. In their pilot studies, Poulin et al. [35] and Skidmore et al. [15] have reported that strategy training had moderate to large effects on the executive functioning and higher-order cognitive abilities required for patients with stroke to perform complex and goal-directed activities [36]. On the basis of these preliminary findings, future studies should examine the effect of strategy training on cognitive functions by conducting standardized neuropsychological assessments.

In addition to positive health effects, the participants acknowledged the role and value of the social support from family members, friends, and therapists during strategy training. With this support, the participants gained the confidence to overcome their fear of attempting new tasks and became more willing to engage in various activities. These findings are consistent with those of other studies [17,37]. Strategy training not only benefited the participants but also enabled their family caregivers to acquire knowledge, learn strategy training, and apply the acquired knowledge to other similar problems. The support that individuals receive from family caregivers plays a crucial role in helping stroke survivors to participate in increased psychosocial activities and improving the quality of life of care providers [38,39]. In Taiwan, family plays a key role in stroke rehabilitation; stroke survivors depend on their family caregivers (spouses, parents, or children) for setting their rehabilitation goals and planning and arranging their daily life schedules [14]. Compared with rehabilitation programs for stroke survivors in Western countries, the success of rehabilitation programs in Taiwan is substantially affected by the participation of family caregivers [18]. This can be explained by the predominant influence of Confucianism and collectivism on Asian culture. Confucianism comprises moral obligations [40]. Taiwanese people advocate collectivist values, emphasizing group interests over individual interests. Therefore,

for family harmony and needs, family caregivers in Taiwan, who are typically spouses, tend to make sacrifices and undertake the role of caring for survivors of ABI [40]. In a rapid ethnographic study, Chang et al. [18] highlighted the differences in cultural norms between American and Taiwanese societies and the crucial role of family support in strategy training. These findings and our study results can serve as valuable references for clinicians to implement strategy training in Taiwan and various cultural contexts.

The participants shared their experiences regarding the barriers affecting the process and outcomes of their strategy training. They identified health and medical conditions as factors that interfered with their training. Numerous participants noted that disease-related symptoms (e.g., pain and fatigue) impeded their training progress and led to frustration. Comorbidities and stroke-related symptoms (e.g., pain and fatigue) were reported to substantially affect the rehabilitation outcomes of survivors, including their body function, self-efficacy, activity levels, and participation levels [41]. These symptoms and conditions may reduce the motivation and confidence of participants to continually implement a global strategy and apply it to various situations [18]. The stages of the transtheoretical model of behavior change (i.e., precontemplation, contemplation, preparation, action, maintenance, and termination stages) can explain why some individuals struggle during strategy training, whereas others excel in the training [42]. For example, individuals who struggle with strategy training may be in the precontemplation stage of the transtheoretical model; that is, they are unprepared to take action and start making healthy behavioral changes. Given the potential effect of these health conditions on intervention outcomes, researchers should examine how therapists can fully address these conditions during strategy training.

The participants identified several environmental barriers to their strategy training practices, including the physical environment and natural events. For example, the participants reported encountering difficulties in implementing their plans at home or in their community because of buildings with poor accessibility, uneven terrain, or inadequate transportation. Individual environmental perceptions (i.e., perceptions and interpretations of surroundings) directly affect community mobility [43]. Environmental factors that affect the participation of people with disabilities include built environments, natural events, transportation, assistive technology, information and technology access, social support and societal attitudes, systems and policies, and economic environment [44]. A large-scale multicountry study reported that environmental attributes (e.g., residential density, land-use mix, street connectivity, aesthetics, crime rate, and proximity to parks) were significantly associated with the recreational walking behavior of adults [45]. The other study explored the satisfaction of customer with restaurants in Taiwan and discovered that only 44% of barrier-free physical environments were accessible to people with disabilities [46]. In that study, people with disabilities were unsatisfied with barrier-free environments, including parking lots, restroom accessibility, and slippery floors, and this phenomenon was not influenced by the building accessibility laws and acts of Taiwan [46]. The universal design concept is still not commonly applied in Taiwan's housing and construction industries, and building accessibility and external environment designs can still be improved [47].

The COVID-19 pandemic was an unanticipated event that disrupted the plans of numerous participants during their training. The study period overlapped with the first wave of the COVID-19 pandemic in Taiwan, during which various epidemic

prevention policies were implemented, namely population-based interventions (e.g., active promotion of face mask use, regulation of social distancing, school closure, ban on indoor gatherings, and performance of temperature checks in public areas) and individual-based interventions (e.g., early screening, home quarantine, home isolation, contact tracing, and restrictions to public transportation use) [48]. These policies limited the participants' access to numerous public facilities and their engagement in community activities. Additionally, previous findings indicate that during the pandemic, most people developed compliant attitudes toward government-implemented measures by engaging in psychological conceptualization, perception, judgement, and imagination [49]. These attitudes considerably affected the participants' engagement in various community activities and limited their performance during strategy training. These findings highlight the major effects of the unanticipated event on the intervention, and they suggest that the related factors should be considered carefully during the implementation of strategy training.

Limitations

The present study has several limitations. First, all the participants in the present study underwent strategy training in clinical trials. Therefore, their training experience may be relevant only in a highly controlled research context, and this training cannot be generalized to individuals in rural hospitals or other rehabilitation settings. Second, all the interviewers and research team members of the present study were involved in the clinical trials examining the effectiveness of strategy training, which could have affected the data collection and analysis. Because the research team members were aware of researcher assumptions, they continually employed reflexivity and conducted weekly team discussions regarding how their research motivations could affect the research process. Reflective memos were made to increase the trustworthiness of the present study.

Conclusions

Individuals with ABI who underwent strategy training in Taiwan reported improvements in their community and social participation, capability to perform various activities, confidence, and cognitive function. Most participants had uncertain expectations before undergoing strategy training because the intervention was novel and differed considerably from conventional rehabilitation programs; thus, providing an introduction before the intervention was helpful for the participants. The inclusion of family members in strategy training was a key factor that influenced the participants' successful attainment of their goals; notably, the participants who reported favorable outcomes received support from family caregivers and therapists during the training. The participants' experiences about strategy training were affected by various barriers (i.e., health and medical problems, the physical environment, and natural events). These findings highlight the crucial factors that should be considered during the adoption and implementation of strategy training for individuals with ABI in non-Western countries. Clinicians and researchers should consider the relevant expectations, benefits, and barriers of patients when they are studying and implementing strategy training in non-Western contexts.

Acknowledgments

The authors thank our team members Yi-Han Huang and Hong-Wei Lin (Taipei Medical University) for contributing to data collection. The authors thank our collaborating hospitals, namely Taipei Medical University Hospital, Wan Fang Hospital, Shuang Ho Hospital, Taipei Tzu Chi Hospital, National Taiwan University Hospital, Bei-Hu Branch, and National Taiwan University Hospital.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Ministry of Science and Technology, Taiwan [grant numbers MOST108-2314-B-038-030-MY3 and MOST111-2628-B-038-015-MY3], National Health Research Institutes, Taiwan [grant number NHRI-EX108-10819PC], Taipei Medical University – Wan Fang Hospital [grant no. 110TMU-WFH-03], and Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation [grant number TCRD-TPE-109-RT-6]. The funding sources did not influence the study design or findings.

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