

ORIGINAL ARTICLE

Rehabilitation in the real-life environment of a shopping mall

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ABSTRACT

Aim: The aim of this study was to explore how shopping malls could be used during rehabilitation and to identify the facilitators and barriers to their use.

Method: Two focus groups, conducted with 15 rehabilitation professionals from various disciplines and working with people with disabilities of all ages were structured around two topics: (i) The usage of malls for rehabilitation and (ii) Factors that facilitate or limit rehabilitation professionals' use of the mall as an environment for clinical assessment and/or intervention.

Results: The thematic analysis revealed that shopping malls were used to achieve several rehabilitation goals targeting physical and cognitive skills, psychological health and socialization. This real-life environment is motivating and helps foster independence and normalization. Factors affecting mall use during rehabilitation included personal factors (e.g. clients' personality and level of readiness) and environmental factors (e.g. clinical context, accessibility of the mall and social attitudes of store owners).

Conclusion: Shopping malls may be a relevant rehabilitation assessment and treatment environment that could contribute to optimizing community integration of people with disabilities.

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► IMPLICATIONS FOR REHABILITATION

- To ensure successful community reintegration, clients could be trained at some point during their rehabilitation, to perform activities in real-life settings, such as a shopping mall.
- Shopping malls appear to enable the attainment of rehabilitation goals targeting a variety of skills.
- This real-life environment appears to be motivating and helps foster independence and normalization.
- Factors felt to affect mall use during rehabilitation include personal factors (e.g. clients' personality and level of readiness) and environmental factors (e.g. clinical context, accessibility of the mall and social attitudes of store owners).
- The shopping mall may be an untapped resource as it appears to be a relevant rehabilitation assessment and treatment environment that could contribute to optimizing community integration of people with disabilities.

Introduction

Participation is the ultimate goal of rehabilitation [1,2]. The WHO International Classification of Functioning describes participation as an outcome of the interaction between an individual's health condition and their contextual factors, including both environmental (e.g. physical, social and attitudinal) and personal factors (e.g. gender, age, life experience, and coping behaviours) [3]. Participation refers to the accomplishment of meaningful roles including but not restricted to domestic life, interpersonal interactions, education, work/employment, economic life, social life, recreation and leisure [3]. It is closely related to life satisfaction [4] and mental health [5].

Although rehabilitation aims to foster participation, it might fail to enable clients to reintegrate fully into the community post discharge [6,7,8,9]. For example, following inpatient rehabilitation, individuals with various disabilities have mentioned feeling

isolated and unable to fully carry out activities in their community [7,8]. Cott [7] reported that clients felt that rehabilitation had adequately addressed the physical issues associated with their condition and had satisfied their basic care needs, but did not adequately prepare them for the complexity of the "real world". A meta-synthesis of qualitative studies with adults with spinal cord injury (SCI) [9] highlighted the lack of training for real-life activities and a perceived gap between the skills and abilities taught during rehabilitation and those useful to accomplish real-life activities. Individuals with SCI also reported that the new skills were taught in a restrictive and limited manner and thus were not necessarily applicable outside of the rehabilitation setting [9]. Finally, in a study comparing hospital-based and home-based rehabilitation, individuals with traumatic brain injury (TBI), their relatives and therapists, thought strategies learned in the hospital were inadequate for use at home [10]. Furthermore, Ponsford et al. [11] suggest that individuals with TBI often do not

generalize what they have learned in the rehabilitation center to community-based activities.

To ensure the accomplishment of meaningful roles following rehabilitation and successful community reintegration, part of the solution could be to train clients, at some point during their rehabilitation, to perform their activities in natural settings [12]. For example, to facilitate re-engagement in everyday life following discharge it has been suggested to broaden the scope of rehabilitation to include leisure and work-related activities [13,14]. To improve physical health and reduce impairments related to locomotion, Robinson et al. [15] suggested individuals should be trained in diverse and complex conditions in the community. The intent is that providing ecologically-valid rehabilitation training and assessment in multiple environments allows for better transfer and application of the skills learned [16]. Adequate training in daily living and social activities during rehabilitation could also foster further participation in physical activities [17]. Moreover, performing assessments in real-life would allow rehabilitation professionals to evaluate the real performance and skill acquisition of their clients [10,18,19] and validate the actual impact of their interventions [20]. Interventions in a real-life setting are believed to be important for people with disabilities across the life-span. A literature review on participation-based rehabilitation for children with physical disabilities underlined ecological validity as one of the crucial criteria for interventions with children and their families [21] and performing activities in daily life was identified as an essential part of goal setting and training when working with frail elderly [22].

Few empirical studies have focused on rehabilitation training or assessment in naturalistic settings for people with physical disabilities. These studies were either conducted in the home environment (e.g. [22,23]) or in a public environment such as a community center (e.g. [24]), and the training and assessment programs ranged from activities of daily living (e.g. [23] or [25]) to leisure and shopping activities (e.g. [26]). Benefits of conducting rehabilitation in real-life settings have been demonstrated in cognitive rehabilitation [10,23,25,26,27,28]. For instance, Cicerone et al. [27] conducted a non-randomized controlled intervention trial to compare the effectiveness of an intensive cognitive rehabilitation program including real-life interventions at home, work or school with standard neuro-rehabilitation. They found that the participants receiving naturalistic interventions showed greater improvements in community integration and community functioning as measured by the Community Integration Questionnaire and the Quality of Community Integration Questionnaire. In a qualitative study investigating how therapy conducted in home and day-hospital environments impact the rehabilitation processes and outcomes for TBI, the findings suggested that the home environment provided strategies better suited for real environments and promoted a more client-centred, goal orientated approach [28]. Another qualitative study focusing on the experience of young men with TBI in a “real-life activities” program in Australia [26] reported that the young men felt well prepared to perform activities of daily living at home and to return to work following the program. Still another study, looking at a rehabilitation program to improve executive functioning among people with cognitive limitations, showed that home interventions help with the generalization of tasks and goal-management [23]. Real-life settings were also found to be useful for physical rehabilitation among the elderly. For example, a rehabilitation walking program in the community enabled the elderly with a history of falls to better deal with the complexity of the environment while improving balance [24].

Despite the support for the use of ecologically-valid environments, their use may be limited by various factors. In one of the

rare studies looking at the determinants of conducting rehabilitation in the community, Barker and Zino [29] interviewed health professionals who reported barriers pertaining to occupational health and safety, efficiency, transport issues/logistics, interaction between the goals and the environment, and the client’s physical condition. Lack of accessibility of the physical environment and organizational barriers were also identified as having an impact on participation-based interventions [30]. Finally, in another study on post-acute/inpatient rehabilitation, the authors highlighted that the capacity of the person has to be considered to ensure he/she can handle the higher quantity of stimulation in natural environments [20]. Indeed, more research is needed to better understand the personal and environmental factors impacting the use of real-life settings during rehabilitation.

To contribute to the knowledge about how to promote the use of ecologically-valid or real-life environments during rehabilitation, we explored rehabilitation professionals’ perceptions of how shopping malls are used during rehabilitation, and present what facilitates or hinders their use during rehabilitation. To our knowledge, the use of shopping malls for rehabilitation purposes has never been reported. The shopping mall is a public space visited by many different people of all ages from diverse cultures with various abilities. In fact, people with physical disabilities use the shopping mall as do able bodied individuals, to shop and run errands but also to meet with friends and family or to see people, to eat and drink, or just to be entertained [31].

Methods

This paper presents the results of exploratory research conducted within the *Rehabilitation Living Lab in the MaLL (RehabMaLL)*, a project initiated by the Center for Interdisciplinary Research in Rehabilitation of Greater Montreal (CRIR) within a shopping mall in downtown Montreal aimed at creating an enabling and inclusive environment to support participation and inclusion of people with disabilities [32].

Participants

The participants were rehabilitation professionals recruited on a voluntary basis from the six rehabilitation center members of the CRIR providing services to people within and around the Montreal metropolitan area. These centers provide in-patient and out-patient services to persons of all ages with a wide range of physical and cognitive disabilities, including those with visual and hearing impairments, and communication and language difficulties. Clinical research coordinators from each facility spoke, during routine clinical activities, about the study with rehabilitation professionals working in various clinical programs (e.g. spinal cord injury, visual impairment, stroke, neurology) in the participating rehabilitation centers. The coordinators then transmitted contact details of potential participants to the first author who then called the eligible participants to describe the study objectives and the nature of their participation. The only inclusion criterion was being able to speak/understand French or English. Ethics approval was obtained from the Ethics Boards concerned and informed consent was obtained from all participants.

Procedure

Considering the exploratory nature of this study, a qualitative methodology was used [33]. We conducted two focus groups at two different rehabilitation facilities with 7 and 8 rehabilitation professionals, respectively. Each focus group lasted approximately

three hours and were held during working hours. Permission to participate in this study was provided by their immediate superior. Each participant received a gift card to a local shop for their participation, and their parking fees were reimbursed, when applicable. A doctoral student (DL), with a background in environmental psychology and the principal investigator of the project (BS) facilitated the focus group discussions using a guide to structure the dialog around two questions: (i) How are malls currently used for rehabilitation or how could they be used in the future? (ii) What are the factors that facilitate or limit rehabilitation professionals' use of the mall as an assessment/intervention environment? A second research assistant attended the focus groups, kept a speaker log and took notes to assist with the transcription and analysis.

Data analysis

The focus groups were recorded and transcribed verbatim. The transcriptions were then coded using NVivo software. An inductive approach was used, meaning the ideas or categories arising from the data were coded without imposing a preexisting framework [34]. First, all ideas expressed during the participants' discourse during the first focus group were coded in themes by the first author. The themes were grouped under two headings: mall uses during rehabilitation and factors influencing mall use. A second research assistant reviewed and validated the labeling of all the themes/subthemes, followed by the first author coding the verbatim transcription from the second focus group. Finally, two co-investigators (BS and AR) reviewed and validated the final coding.

Results

Participants

We met with 15 rehabilitation professionals from six rehabilitation centers from the metropolitan region of Montréal and one center serving a semi-rural population. There were two men and 13 women with varying levels of clinical experience (i.e. new graduates to senior therapists) from various disciplines: occupational therapists (3), physiotherapist (1), special care Counselors (4), orientation and mobility specialists (3), audiologists (2), social worker (1), and leisure technician (1). They worked with children,

adults or the elderly with various types of disability: physical (e.g. SCI, multiple sclerosis), neurological/cognitive (e.g. TBI, stroke), visual or hearing. The characteristics of the participants are presented in Table 1.

During the focus groups, the rehabilitation professionals discussed the perceived benefits of using shopping malls as a setting for rehabilitation as well as the factors that influence their use/usage. Figure 1 shows the themes and subthemes regrouped under the two headings: Perceived Benefits of Using Shopping Malls During Rehabilitation and Factors Perceived as Influencing Mall Use During Rehabilitation. It is important to note that the participants did not refer to a specific shopping mall with specific features, but rather spoke about shopping malls in general.

Perceived benefits of using shopping malls during rehabilitation

Participants mentioned many reasons why they used or could use a mall during their rehabilitation, commenting mainly on the achievement of rehabilitation goals or the real-life context provided by the mall environment.

The majority of professionals mentioned using shopping malls to varying degrees in their clinical practice. As with all community-based interventions, they underlined the importance of aligning the activities in the mall with the needs of the person living with a disability. As an occupational therapist working with the older adults (P1) mentioned, "In terms of efficacy, it's a win-win situation both for the patient and the professional. If your patient improves his balance, walking endurance, or divided attention in functional situations [...] and at the same time he integrates these improvements into his everyday life, it's a success for everyone". Another participant stated: "Throughout the rehabilitation process, we should put them in situations where they would have to be observed by others, but with professionals around to support and help them, allowing them to live fully and actively for the rest of their "new" life. It's great to say it, but it's better to put it in action" (P15, Leisure Technician).

Achievement of rehabilitation goals

Some rehabilitation professionals mentioned the mall was a setting that enabled training and supported learning of various functions, skills and roles. For instance, in the mall, people with visual

Table 1. Description of participants (n = 15).

No	Gender	Discipline/ profession	Age of patients			Phase of Rehabilitation		Diagnostic groups treated	User of shopping malls in rehabilitation
			Children	Adult	Elderly	Outpatient	Inpatient		
1	Female	Occupational therapist			x	x		Stroke	No
2	Male	Occupational therapist		x	x	x		Various mobility impairment	No
3	Female	Occupational therapist		x	x	x		Various mobility impairment	Yes
4	Female	Physiotherapist			x		x	Severe orthopedic injury and pulmonary disease	No
5	Female	Special care Counselor	x	x		x		Hearing and mobility impairment	Yes
6	Female	Special care Counselor		x		x		Spinal cord injury, traumatic brain injury, severe orthopedic injury	Yes
7	Female	Special care Counselor		x	x	x		Stroke	Yes
8	Female	Special care Counselor		x		x		Various mobility impairment	Yes
9	Female	Orientation and mobility specialist		x		x		Visual impairment	Yes
10	Female	Orientation and mobility specialist		x	x	x		Visual impairment	Yes
11	Female	Orientation and mobility specialist	x		x	x		Visual impairment	Yes
12	Female	Audiologist			x	x		Hearing impairment	No
13	Male	Audiologist			x	x		Hearing impairment	No
14	Female	Social worker		x		x		Neurology, rheumatology, severe orthopedic injury	Yes
15	Female	Leisure technician		x			x	Various mobility impairment	Yes

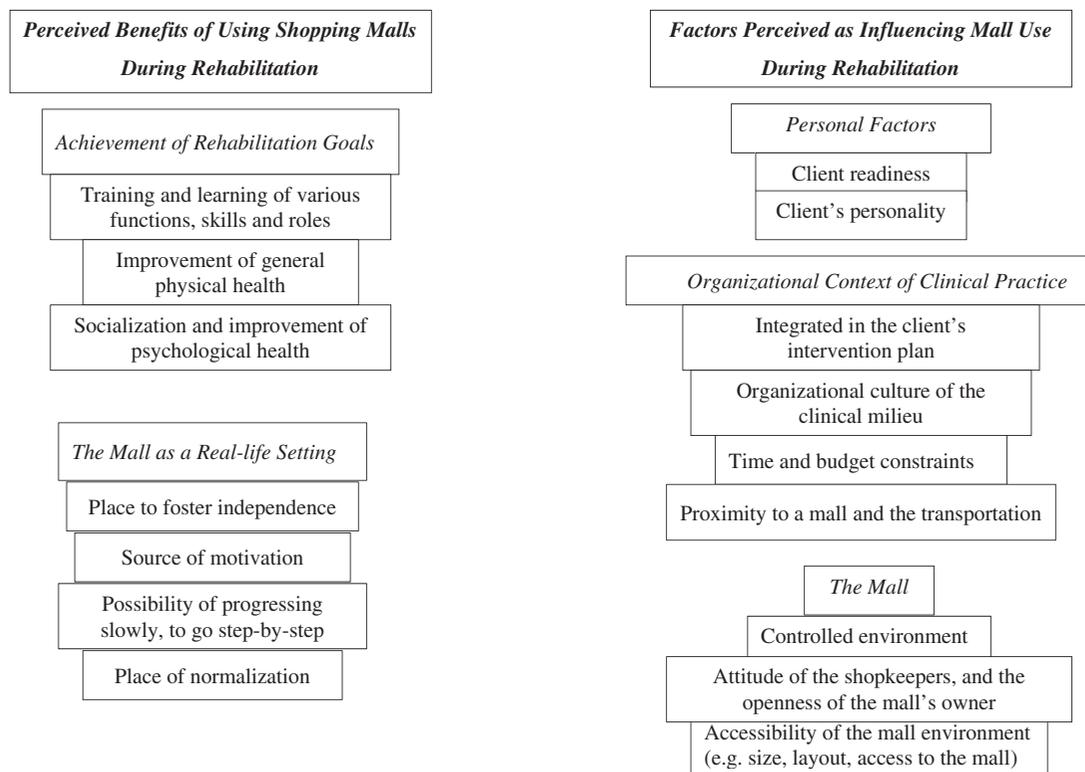


Figure 1. Themes and sub-themes mentioned by the rehabilitation professionals.

impairments could develop and practice their way-finding skills. "Sometimes I'm just a seeing guide person. I would just help the person get the feeling of what it is to move around in a shopping mall" (P9, Orientation and mobility specialist). Purchasing and payment activities were seen as opportunities for communication, goal planning, improvement of organization, and problem-solving skills as well as executive functioning. "You can see if they can plan... you can assess the financial aspects, if they are able to calculate" (P4, Physiotherapist).

The mall was also identified as a place for rehabilitation clients to improve their general physical health; for example, they could walk longer distances or carry purchases to develop endurance. A participant mentioned: "I was going to the mall with clients who had to practice walking, because often their apartment is not big enough" (P7, Special care Counselor and P14, Social worker).

Finally, for the participating clinicians, the mall provided opportunities for socialization and improvement of psychological health for people with disabilities. They mentioned the benefits of asking shopkeepers for help or meeting with friends. "It's a place [...] to meet with friends, to go eat at the restaurant. In the mall's food court, it's often so noisy; we have to teach the child, teenagers and adults new communication strategies." (P5, Special care Counselor). An orientation and mobility specialist (P10) reported: "With people with visual impairments, the greatest difficulties are when it's time to ask for a price or to find the cashier. It's even an obstacle preventing them from going into stores. Therefore, it will sometimes be the goal of the visit. I will tell them 'today you are making a purchase' to kind of push them." According to the participants, conducting activities in the mall is useful because it allows the generalization (transferability) of all the skills learned during inpatient rehabilitation.

The mall as a real-life setting

The mall was identified as a place to foster independence, as rehabilitation clients could practice skills without having to rely on

their spouses or their friends, but have the help of professionals, if needed. "It's a great opportunity to practice independence when asking for help or questions. Sometimes when they are with their spouses, they would rely on them too much. And it's less disturbing to practice those kinds of requests in a shopping mall than when they will end up alone after the hospital" (P12, Audiologist).

The mall was also seen as a source of motivation. The rehabilitation professional and the client could identify something the person would want to buy or need to do at the mall. Having a specific goal encourages clients to get out and try to engage in an activity. "You find something motivating, for instance, in this specific mall we can go buy something people need. People will more likely make the effort to go. So we try, and if it works well, and the person feels she is well served, she will be motivated to go back again" (P11, Orientation and mobility specialist).

The professionals also mentioned the possibility of progressing slowly, to go step-by-step. For instance, it could mean starting by visiting a smaller mall close to the rehabilitation center for a certain period of time and then, when the person feels comfortable enough, going to a bigger mall using public transportation. This way, the client could build his/her confidence while gradually introducing new and more difficult rehabilitation goals. As one of the professionals mentioned, "when the activity goes well, the people with disabilities are proud of themselves which helps them build their self-esteem" (P5, Special care Counselor). The possibility of seeing progress can motivate the client. Moreover, the participants underlined the importance of consulting with the other professionals from the multidisciplinary team working with the client, to better understand the client's capabilities prior to going to the mall.

As a real-life setting, the mall represents a place of normalization. The participants described it as a place where the person in rehabilitation could feel like everyone else. Malls are familiar places where most people in North America usually go or have gone at least a couple of times in their life. "And it also gives them the

opportunity to realize they are able to live again ... It's normal to go shopping, to stand waiting to pay at the counter. 'I'm like everybody else'" (P15, Leisure Technician).

Finally, as a public place where a lot of different people gather and move around, the participants saw the mall as a setting that respects the client's desire for anonymity. Rehabilitation clients can practice their walking skills with a new mobility device around people they do not know, before being ready to go visit relatives. As an orientation mobility specialist (P11) said: "And there is the acceptance ... Someone who needed a cane said 'Well I don't want to start on my street, all the neighbors will see me!' so we go to the mall ... It's less threatening."

Factors perceived as influencing mall use during rehabilitation

After discussing how they used the mall in their rehabilitation practice, the participants described the factors they perceived to facilitate or hinder rehabilitation activities in the mall. The two levels of analysis regarding the determinants pertain to personal and environmental factors, the latter being subdivided into the organizational context of clinical practice and the mall environment.

Personal factors

At the individual level, professionals referred to client readiness as being both a facilitator and a barrier to conducting rehabilitation activities in the mall. The client's needs and interests must always be considered because they influence the choice and the timing of the rehabilitation activities. For instance, one participant mentioned that one of her clients was ready to go out and test (practice) his new skills in the mall as early as the beginning of his rehabilitation: "I had a client for whom there were no limits. He was saying 'just tell me how to go, I'll go'" (P10, Orientation and mobility specialist).

One of the special care Counselors (P5) added that clinicians must consider the client's personality; some clients are shy and slow learners, while others are more outgoing and like to socialize, thus influencing the choice of rehabilitation activities to perform in the mall. "I worked with an 80-year-old woman who was very isolated in her residence for the elderly ... She was eager to return to the mall and she had hoped with her cochlear implant ... When she saw it was very difficult, I suggested, 'we can always go see your friends [at the mall], and tell them you are hard of hearing'. She was so proud to have made the step to go and meet her friends!"

Environmental factors – organizational context of clinical practice

The environmental factors referred to most often by the rehabilitation professionals pertained to their clinical practice. First, they felt that when activities in the mall were an integral part of the client's intervention plan, it was a great facilitator for conducting rehabilitation in the mall. "The mall is my therapeutic environment, it's part of the client's objectives, it is explicitly stated in the intervention plan" (P6, Special care Counselor). In this particular case, the participant was working in a rehabilitation center located on the second floor of a mall, which was considered as an extension of their rehabilitation center. According to participants, it is easier for some professions than for others to use the mall in their practice. As a participant stated, "My role as a special care Counselor allows me to conduct rehabilitation outside the center. It is clearly stated that I will go into clients' home or in the community. It's part of my job. For other professionals such as physiotherapists, it's individual therapy, it's more complicated" (P6, Special care Counselor).

Participants discussed how the organizational culture of their clinical practice was a factor influencing rehabilitation in the mall.

It was easier for rehabilitation professionals when the rehabilitation center's administration was open to bringing clients to the mall. "Everything depends of your administration and the latitude you have" (Special care Counselor). Time and budget constraints were also seen as barriers. Conducting rehabilitation activities in the community often requires more time than those conducted within the walls of a facility, reducing the number of clients that can be seen by each professional, and challenging the center's "productivity requirements". Proximity to a mall and the related need for transportation to the mall and back were reported as affecting the possibility of providing rehabilitation in the mall. One professional said, "To go to the mall, you need to block an entire afternoon, which means you'll have to cancel three other clients ... You need to reserve transportation and take it with your client. With the actual budget and time constraints, we are limited" (P4, Physiotherapist).

Finally, with regards to clinical practice, the participants proposed that knowledge transfer activities (KTA), such as best practice guidelines, should be developed to learn more about how best to use a mall during rehabilitation. For instance, KTA could provide information about the best time to introduce rehabilitation activities in the mall or the optimal number of visits to achieve transfer of skills. The participants mentioned that short activities that could be conducted in the mall should be suggested, thus helping professionals include them in their practice.

Environmental factors – the mall

The environmental factors mentioned by the rehabilitation professionals concerned the accessibility of the physical and social environments of the mall, particularly collaboration with mall owners, shopkeepers and employees.

The mall was described as a controlled environment, facilitating mall use during rehabilitation because it minimized clients' stress. In fact, according to the participants, the mall represented the right compromise between the rehabilitation center, an environment where almost everything is controlled, and the outdoor environment (e.g. the streets) where there are many uncontrollable variables (e.g. pedestrians and vehicle traffic, maintenance/state of the pavement, Canadian winters, etc.). "It allows one to be more efficient in a way, when you have specific goals, whether it rains or it snows. It's more controlled" (P2, Occupational therapist). For people with visual impairments, the controlled environment of the mall could also facilitate the training of echolocation skills for orientation, because the walls and openings can be perceived more easily than in other environments.

In terms of the accessibility of the mall environment, the size and layout of the mall was identified as a facilitator to mall use during rehabilitation. Participants talked about the long hallways particularly suitable for practicing walking and wayfinding. They also mentioned that some mall designs were easier than others "For the clients, a small mall is better, with right angle corners. It's easier and helps wayfinding" (P10, Orientation and mobility specialist). Rehabilitation professionals reported that outside access to the mall was often problematic. For instance, an orientation and mobility specialist said that malls rarely have a well-marked footpath to travel from outside parking to the mall, making it unsafe for people with visual impairments and for those with limited mobility. For blind people, the lack of adapted floor plans also represents an impediment to rehabilitation in a mall. Available accessible plans can help clients prepare for their trips to the mall by helping them build a mental map of the mall, which then facilitates their orientation in the space. The professionals also reported the lack of benches to rest/relax as a barrier for their

clients who have limited endurance and who tire easily. In the words of an occupational therapist (P1): “For the majority of my clients, after 5–7 minutes, they need to sit and there is rarely place to sit in the stores”.

The attitude of the people working at the mall, and the openness of the mall owner, were identified as important facilitators for rehabilitation activities in the mall. The participants felt it was very helpful when the mall staff and shopkeepers were informed about people coming to the mall for their rehabilitation. A professional mentioned: “We MUST let people know that the mall will be used for rehab activities. You WILL see people with X conditions, doing Y activities with or without a clinician” (P4, Physiotherapist). This might be easier if the mall and the rehabilitation center establish an official collaboration, like the one established within the RehabMaLL project [32].

The professionals also made some suggestions about how to facilitate rehabilitation in the shopping mall. They thought dedicated periods of time for rehabilitation inside and outside of regular business hours could be used to practice different skills. Another suggestion included dedicated areas within the mall for rehabilitation activities. One special care Counselor (P5) suggested “To have a place to practice, for example if I want to go to the restaurant, there would be a place where I can practice ordering something.”

Discussion

The goal of this study was to contribute knowledge about the use of ecologically-valid or real environments during rehabilitation, using the shopping mall as an example. We also sought to understand the determinants affecting the use of shopping malls during rehabilitation. This exploratory study highlights how the mall is being used and can be used to train and assess a variety of skills. As a real-life setting, rehabilitation professionals believe the mall promotes independence, a feeling of normality and motivates their clients. Perceptions about the determinants affecting mall use for rehabilitation purposes were related to personal factors such as the client’s personality and level of readiness, and to environmental factors including the clinical context, the accessibility of the mall and social attitudes of storeowners.

This study suggests that the mall environment provides rehabilitation professionals with the opportunity to train their clients with disabilities on a variety of tasks related to physical, emotional and social aspects of their life. Our findings are consistent with those of Delle Fave et al. [35] who argue that persons should be exposed to meaningful activities and environments to achieve health interventions that promote the best attainable physical, psychological, and social well-being. Moreover, community outings provide the person with a disability with the opportunity to be an active part of their care [36] giving them back power over their life. Regarding community integration, professionals also talked about the mall as a normalizing environment; people with disabilities want to feel a part of their community, and using the mall for rehabilitation gives them the opportunity to carry out their daily activities like everyone else.

The rehabilitation professionals also felt the mall could be a source of motivation for people with disabilities. This result is corroborated by Sullivan et al. [26], who suggested that motivation is enhanced through real-life activities which in turn improve the enjoyment, engagement and satisfaction of people with disabilities in rehabilitation and help them return to their life. Motivation and goal achievement have been shown to positively influence people with stroke; when motivated towards achieving a goal, they are less likely to be depressed, and they perceive their

participation in everyday and community life more positively [37]. Indeed, the motivation of clients is thought to be an important factor related to the success of rehabilitation [38].

In this study, some of the factors influencing the use of a mall during rehabilitation were identified. This information may be helpful for clinicians wishing to use the mall as a place to provide treatment. The finding about the importance of personal factors suggests that rehabilitation interventions using the real-life environment of the mall could foster a client-centered approach. This is echoed by Doig et al. [10] who found that rehabilitation in the home environment promoted a more client-centred and goal oriented approach. Applying a more client-centered approach (e.g. offering more individualized training), has been proposed to improve the ability of people with a disability to become active in their communities and live fulfilling lives, “albeit within the constraints of their condition” [8,35]. For instance, the rehabilitation professionals may wish to learn about their clients’ needs and interests before the onset of the disability, and explore how the mall environment could be used to help respond to these needs during rehabilitation.

The rehabilitation professionals in this study reported that aspects of clinical practice may affect rehabilitation activities in the mall, with the organizational culture and structure emerging as particularly important. Workload and staffing issues have been identified as limiting the ability for rehabilitation professionals to use a client-centered approach in their practice, including using real-life settings [39]. In their study on participation of people with disabilities, Magasi et al. [30] reported that rehabilitation professionals often felt their desire to promote the participation of the people with disability in their clinical practice conflicted with the procedures imposed by rehabilitation settings. Our study also exposes transportation issues limiting the use of the mall during rehabilitation. However, only Barker and Zino [29] have identified transportation as an obstacle to rehabilitation in real-life settings in the community.

Finally, the physical and social environment of a mall may determine whether it is used as a treatment space. Mall size, layout and ease of access appear to be important determinants of use during rehabilitation. Similar environmental determinants were identified in other studies looking at the participation of people with disabilities in shopping malls [31,40,41,42] or other public spaces (e.g. [43,44,45]). Again, the attitude of the store owners and their openness to people with disabilities have been identified as really important to promote social participation in the mall (see [31]) and in society [46]. Moreover, using a real-life setting for rehabilitation provides an opportunity for community members, who may be unfamiliar with disability issues, to interact with people with disabilities [36], thus fostering social inclusion. In Quebec, rehabilitation professionals are protected by their employment insurance policies when they extend their work outside the walls of their rehabilitation center into a shopping mall, for example. Since this may not be the case in other parts of the world, rehabilitation professionals should thus keep in mind the possible legal and insurance ramifications related to the provision of rehabilitation in public settings.

Indeed, regularly providing rehabilitation in the real world may be challenging. Other options could include virtual rehabilitation and telerehabilitation. For instance, virtual reality could be a potential solution as it provides complex tasks for training and assessment [47] using simulated real world environments. It may be a great motivator to practice specific skills [48] and it could provide stimulation without increasing the workload of the staff [49]. Telerehabilitation in clients’ homes reduces the barriers

associated with transportation [48] and time constraints [50] related to using real world environments in rehabilitation.

With regards to the strengths and weaknesses of this research, we believe this study respects the criteria trustworthiness for qualitative study [51]. For instance, to ensure credibility, the analysis followed an iterative process involving a back-and-forth movement between the transcriptions and the codes, and the coding was validated by more than one researcher. Also, we believe we provide enough description of the themes to ensure transferability [52]. This study is however limited by the small sample size, and because saturation may not have been achieved with only two focus groups. However, it is the first study to explore the topic of using the real-life setting of a shopping mall for rehabilitation. Moreover, participants were from a variety of professions and worked with persons of all ages with various disabilities. We also did not record the number of years of experience of the rehabilitation professionals since *a priori* we did not believe it would affect their perceptions. However, after conducting the focus group, we realized that their experience probably influenced their beliefs about using the mall during rehabilitation, or their actual use of malls in their practice.

Future research is needed to corroborate the perceived benefits of the shopping mall identified in this study. Furthermore, the actual benefit of using ecologically-valid environments during rehabilitation should be further investigated in clinical trials.

Conclusion

The shopping mall represents a real-life environment with several perceived benefits for people with physical disabilities. It appears to be a relevant rehabilitation assessment and treatment environment that could contribute to optimizing community integration of people with disabilities. The results of this exploratory study provide food for thought for clinicians regarding the potential benefits of using ecologically valid environments as part of their rehabilitation practice; indeed, the shopping mall may be an untapped resource.

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Disclosure statement

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