



Research Article

Translating an Evidence-Based Physical Activity Service From Context To Context: A Single Organizational Case Study

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Keywords: Implementation; Leisure-time physical activity; Evidence-based program; Spinal cord injuries; Disabilities; Consolidated framework for implementation research; Behavioural counselling

Abbreviations: CFIR: Consolidated Framework for Implementation Research; CIRRS: Centre Interdisciplinaire de Recherche en Réadaptation et en Intégration Sociale; CIUSSS-CN: Centre Intégré Universitaires de Santé et de Services Sociaux de la Capitale National; GIM: Get In Motion; IRDPQ: Institut de Réadaptation en Déficience Physique de Québec; LTPA: Leisure-Time Physical Activity; PAL: Passez à l'Action; SCI: Spinal Cord Injury

ABSTRACT

Background: SCI Action Canada partnered with researchers to adapt an evidence-based leisure-time physical activity (LTPA) counselling service (Get-in-Motion (GIM)). A satellite GIM service called Passez à l'action was established within a French-speaking context for persons with physical disabilities. An understanding of the determinants that influenced the implementation and functioning of the GIM service within the Adaptive context are required to maximize the potential of other community-based LTPA services being successfully introduced in similar organizations.

Purpose: The case study objectives are to: 1) describe the characteristics and implementation contexts of two leisure-time physical activity counselling services for Canadians with a physical disability and the adoption process that took place when the protocol was translated to a new context, and 2) elucidate, from the point of view of the service providers, the organizational determinants that could have facilitated and/or hindered the implementation and functioning of these services.

Methods: Guided by the Consolidated Framework for Implementation Research, focus groups were held with the directors and staff of each service. Mixed-content and thematic analyses were then used to determine overarching themes.

Results: Findings suggest that the presence of service innovators fosters ownership of the service and facilitates ongoing staff training and support. A thoughtful implementation plan should be included as a component of translation between contexts.

Conclusions: Lessons learned and recommendations for future translation of similar evidence-based services to additional contexts are discussed.

INTRODUCTION

Persons with physical disabilities experience limitations to their musculoskeletal and/or neurological body systems that influence their functional abilities [1]. Despite evidence demonstrating that participation in leisure-time physical activity (LTPA), or physical activity that one chooses to do in their spare time [2], is associated with many benefits for people with physical disabilities [3-7] inactivity levels remain high within



this population [8]. A commonly reported barrier to LTPA participation among persons with physical disabilities is a lack of evidence-based LTPA resources and services that have been implemented within the community [9]. Thus, the provision of evidence-based LTPA resources and services remains a priority for this population.

SCI Action Canada is a community-university research alliance that aims to promote LTPA participation among persons with spinal cord injury (SCI; [10]). In June 2008, SCI Action Canada translated two randomized controlled trials testing the efficacy of behaviour change techniques on LTPA participation among persons with SCI [11,12] into a nationwide LTPA telephone-counselling service called Get In Motion (GIM). GIM is an evidence- and theory-based service designed to provide LTPA information [13-15] and education on behaviour change techniques. Such LTPA information have been shown to be efficacious for enhancing theory-based determinants of LTPA participation [16,17], particularly within the SCI community [11,12,18,19]. The original 8 and 10-week randomized controlled trial protocols were adapted during the development of GIM. First, the main barriers to LTPA participation in the SCI community were addressed by (a) providing knowledge on how and where to be active, (b) teaching skills that will help clients increase and maintain LTPA motivation and behaviour, and (c) offering the service at no cost to adults with SCI [20]. Second, the protocols were further modified to the “real-world” context by offering the service for six months. This adaptation aligns with research indicating that telephone-delivered LTPA interventions lasting at least six months are more effective than interventions of shorter duration in applied settings [21]. The resulting GIM program consist in a six months telephone counselling program, where counselors contact the participants with SCI on a predetermined basis (e.g. each week for eight weeks, each two weeks for eight weeks and each month for two months). The content of the counseling sessions (approximately 30 minutes each) includes discussions about (but not limited to) beliefs, self-efficacy, obstacles to the practice of LTPA and coping strategies, and so on. The program also includes the evaluation of LTPA time and socio-cognitive determinants.

From its inception in June 2008 to June 2011, GIM was implemented as an applied, evidence-based service across Canada; clients’ LTPA intentions were sustained throughout the service, and more clients were active at the end of the service than at the beginning [22]. These results suggest that GIM is effective at promoting LTPA intentions and behaviour in the SCI community. However, over this three-year period, the service only reached 65 Canadians with SCI (estimated proportional reach of 10%), with the majority (62%) of clients being from the province of Ontario [22]. There was also a greater need for rigorous monitoring of implementation to better understand outcomes. These findings led to refinements in the national promotion and implementation process of GIM, along with a re-launching of the service in September 2011.

One of the limitations to the reach of the first phase of GIM was that the service was only available to English-speaking clients, neglecting almost one-fifth (22%) of the Canadian population who speak French as their first language [23]. During the refinement of the GIM service, SCI Action Canada partnered with researchers from the Centre interdisciplinaire de recherche en réadaptation et en intégration sociale (CIRRIS), the research center of the Centre intégré universitaires de santé et de services sociaux (CIUSSS-CN)/Institut de réadaptation en déficience physique de Québec (IRDPO). There was an opportunity for CIRRIS to adopt the GIM protocol within its community-based LTPA organization called Adaptavie. A satellite GIM service called Passez à l’action (PAL) was established within a French-speaking context for persons with physical disabilities. An understanding of the determinants that influenced the implementation and functioning of the GIM service protocol within the Adaptavie context would be useful for maximizing the potential of other community-based LTPA services looking to expand to additional contexts.



Therefore, the objectives of this study are: 1) to explore and describe the characteristics and implementation contexts of the GIM and PAL services and the adoption process of the GIM protocol by Adaptavie; and 2) to elucidate the organizational determinants that could have facilitated and/or hindered the implementation and functioning of the two services, as described by service providers.

METHOD

We performed a multiple-case study to gather an in-depth and contextualized insight of the two Canadian LTPA counselling services for adults with physical disabilities. This type of research allowed us to focus on the “what” and “why” research questions about a phenomenon for which the researchers have little control [24]. We thus explored in depth, using multiple methodologies, the implementation of the two services in different context. Given our interest in examining the array of elements that could influence the implementation of both services at an organizational level, the Consolidated Framework for Implementation Research (CFIR; [25]) was used as an organizing structure for both aspects of the current study. Ethical approval was obtained from research ethics boards at IRDPQ, University of Toronto, and McMaster University. Below, we describe the service characteristics, implementation contexts, and adoption process. In turn, our focus group protocol is described.

Description of the Characteristics, Implementation Contexts, and Adoption Process of the Services

Get In Motion (GIM): A description of the refined GIM service according to the five domains of the CFIR framework is provided in table 1. GIM was initially created to meet the specific needs of the individuals with spinal cord injury, as the researchers who tested the intervention had an expertise in promoting LTPA with this clientele. It was implemented by Spinal Cord Injury Canada specially to meet the needs of the members of this association. Within the SCI Action Canada context, the focus of GIM is to provide theory- and evidence-based motivational support for clients to initiate and maintain a physically active lifestyle. All sessions are delivered over the telephone. The strong researcher presence within the organization provides a culture that facilitates a high implementation climate, as well as expertise and continuous training opportunities in the application of behaviour change theory and techniques for the counsellor.

Translating GIM and implementing it into the Adaptavie context: The GIM researchers provided their refined protocol manual and resources to CIRRIIS researchers, who facilitated the translation of the documents from English to French by a bilingual research assistant. The implementation strategy consists mainly in three educational meetings [26] (about 1.5 hours each) held in the CIRRIIS offices. Since the educational meetings were held by a researcher very well know and recognized, it could be considered that a local opinion leader strategy was used. The CIRRIIS research team met with the Adaptavie staff to discuss the protocol and documents. The Adaptavie staff then used all of the translated GIM documents to offer the PAL service to its existing members starting in fall 2011. There was no follow-up or evaluation after the end of the implementation strategy.

Passez à l'action (PAL): A description of the PAL service according to the five CFIR domains is provided in table 1. Within the Adaptavie context, the focus of PAL is to develop aerobic and strength-training exercise routines for Adaptavie members, a novel approach to LTPA participation in the Adaptavie context; thus, LTPA counselling sessions take place both in-person and over the telephone. Contrary to the GIM service, there is minimal researcher presence within the PAL service, a moderate organization implementation culture, and little to no on-going educational and training opportunities in the application of behaviour change theories and techniques for service providers. In addition,



Table 1: Descriptive comparison of the Get in Motion (GIM) and Passez-à-l'action (PAL) Services using the CFIR Framework.

CFIR Domain	GIM	PAL
Intervention characteristics	<ul style="list-style-type: none"> Source: Intervention originated from randomized controlled trials led by the research team members Mode: Telephone-based counselling Dose: 14 behaviour change sessions over a 6-month period; session topics tailored to clients' stage of change Theoretical Framework: Health Action Process Approach [32] 	<ul style="list-style-type: none"> Source: Intervention originated from GIM, externally developed service Mode: Significant proportion (~50%) of counselling sessions offered face-to-face; remaining sessions offered via telephone Dose: Flexible counselling session structure over a 2- to 4-month period Theoretical Framework: Health Action Process Approach [32]
Outer setting	<ul style="list-style-type: none"> University-based context, urban setting Service strongly supported by SCI Action Canada (researchers and staff) and its funders Target clients: English-speaking adults with SCI 	<ul style="list-style-type: none"> Community-based context, urban setting External English-French translation support from CIRRIIS researchers Target clients: French-speaking adults living with various physical disabilities resulting from stroke, arthritis, multiple sclerosis, etc.
Inner setting	<ul style="list-style-type: none"> Structural characteristics: Service established in 2008 and refined in 2011; implemented by three researchers and operated by two staff members (1 counsellor and 1 coordinator), researchers and staff worked closely throughout implementation Culture of evidence-based practice and respect of scientific standards Implementation climate: Facilitating Readiness for implementation: High 	<ul style="list-style-type: none"> Structural characteristics: Service established in 2011; implemented by two researchers and one coordinator and operated by one staff member (kinesiologist) Culture of flexibility and innovation Implementation climate: Neutral to facilitating Readiness for implementation: Moderate
Characteristics of individuals (service providers)	<ul style="list-style-type: none"> Providers have scientific background, highly engaged in evidence-based ways to improve LTPA for individuals with SCI Providers well-informed about behaviour change theories/techniques and their integration into the service Many opportunities for the counselor to receive education/training in behaviour change theories and techniques 	<ul style="list-style-type: none"> Providers have significant practical experience in offering physical activities for individuals with disabilities Providers minimally-informed about behaviour changes theories/techniques and their integration into the service Minimal training opportunities related to behaviour change theories and techniques
Implementation process	<ul style="list-style-type: none"> Internally-driven, well-planned implementation process (by researchers and staff) Presence of opinion leaders, champions and external change agents On-going opportunities for feedback and reflection about implementation between research team and counsellor 	<ul style="list-style-type: none"> Externally-driven implementation process (by researchers) Less intensive implementation process Presence of champions

Note: CFIR, Consolidated Framework for Implementation Research; CIRRIIS, Centre interdisciplinaire de recherche en réadaptation et en intégration sociale; GIM, Get in Motion; LTPA, leisure-time physical activity; PAL, Passez-à-l'action; SCI, spinal cord injury

Organizational Barriers and Facilitators of the Implementation of the GIM and PAL Services

Procedure: Two focus groups—one with GIM service providers (English) and one with PAL service providers (French)—were led by a bilingual facilitator (MEL) not involved in the implementation of the two services, two years after the re-launching of GIM and initiation of PAL. The focus groups served to address our second objective, to elucidate the service providers' perceptions of the organizational determinants that could have facilitated and/or hindered the implementation and functioning of the two services. Both focus group discussions were audio-recorded, and transcribed verbatim.

Participants: All the staff who participated in the current implementation and operation of the two services (n=13) were invited to participate in the focus groups. For GIM, participants (n=5) included the service directors (three researchers who conducted the original randomized controlled trials upon which GIM is founded [11,12], and who led the development of GIM within the applied context; one of these researchers is also the director of SCI Action Canada), the GIM service coordinator (who is responsible for recruiting and managing the day-to-day operations of the GIM service), and the counsellor (who delivers the telephone-based sessions). For PAL, participants (n=4) included the Adaptavie director (a manager with a Master's of Business Administration), the Adaptavie service coordinator (who is responsible for recruiting and managing day-to-day operations of the PAL service, as well as all other activities at Adaptavie), one researcher who was involved in the translation of the GIM documents, and the kinesiologist (who delivers the face-to-face and telephone-based sessions). Three individuals, one GIM counsellor, one GIM coordinator and one PAL



kinesiologist moved on from SCI Action Canada or Adaptavie and could no longer be contacted.

Interview guide: A semi-structured interview guide was developed for the focus groups based on the five CFIR domains [27,25]. The interviewer asked one broad question per domain, and further probed participants in discussing the dimensions related to each domain (see table 2 for a listing of CFIR domains and subdomains).

Analysis: A bilingual research assistant (IC), not involved in the two services and who was blinded to the context of both GIM and PAL, performed a mixed-content analysis of the focus group transcripts. The initial codes were based on the five CFIR domains and subdomains [25], with additional codes being created when the participant responses did not fit within the CFIR framework. A second analyst (MEL), also external to the two services, counter-coded 10% of the data to evaluate the accuracy and relevancy of the coded themes and patterns. Analysts agreed on 84% of the codes, and discrepancies were resolved through discussion. A second round of coding was performed on another 10% of the transcripts to increase the accuracy and relevancy of the coding. Codes were then subjected to a thematic analysis [28] to determine the overarching implementation themes across the CFIR domains.

RESULTS AND DISCUSSION

An overview of the major themes influencing the implementation of the two services are presented and discussed below. The complete results, their relation to the CFIR domains, and the major themes are provided in table 2. The subdomains under each of the five CFIR domains were used to direct the follow-up probes used by the interviewer during each focus group. For example, under the subdomain of “Intervention characteristics”, a probe concerning cost of the intervention would be, “What costs are incurred when delivering the intervention.

Innovators foster ownership of the service

The first theme emerging from the focus groups related to the involvement of the service innovators (researchers who developed the service) during implementation. The GIM service directors are the three researchers who conducted the randomized controlled trials upon which the service is based [11,12], and thus have in-depth knowledge of the service’s theoretical and evidence-based foundation. The researchers remain highly involved in the service’s daily operations because they have a sense of ownership over GIM, and are dedicated to its implementation and long-term functioning despite this not being a traditional role for researchers within an academic institution. As stated by one of the GIM researchers: “GIM is a volunteer activity. We have our distinct research programs and have been able to have this very unique knowledge translation opportunity; however, it’s in addition to our teaching, our service to the university, and our research. So we’re already giving a lot of our time and resources that we’ve sought out.” The researchers’ high level of involvement in, and consequently their sense of ownership to, the service is passed down to the staff who interact with the clients: “We have this element of (GIM) is almost a family. It’s not just a service where (the clients) get a little bit of support. They’re accountable to us and we’re accountable to them.” (GIM Service Coordinator).

However, the strong ownership within the original GIM service may provide a challenge to other individuals and organizations that adopt and implement the service, because their setting may not have the same expertise as those of the researchers who developed the GIM service. In the case of PAL, the CIRRIIS researchers and Adaptavie were eager to adopt the GIM protocol and offer a similar service to their French-speaking clients. The CIRRIIS researchers and Adaptavie staff were confident in the quality of the evidence and foundation of theory built into the GIM protocol because



of the research upon which GIM is based: “CIRRIS contact[ed] us to implement the intervention, and it is research-based, so it’s solid...” (Adaptavie Director). The PAL team felt the GIM protocol had the characteristics of adaptability and trialability, which could facilitate its implementation within their community-based context. As mentioned by the Adaptavie service coordinator, “We like it - the fact that we can fit it into our usual programming and try it with only a few users...” While the CIRRIS researchers are closely linked to Adaptavie, they did not have a front-line role in the implementation of the PAL service and acted more as knowledge brokers. Accordingly, the CIRRIS researchers served as the link between the GIM researchers and Adaptavie staff; however, Adaptavie was autonomous in the implementation of PAL. The CIRRIS researchers, contrary to the GIM researchers, did not assist the PAL staff in tailoring

Table 2: Focus group results according to the CFIR domains and related major themes.

CFIR Domain	GIM	PAL	Major Theme(s)
Intervention characteristics Subdomains: <ul style="list-style-type: none"> Intervention source Evidence strength and quality Relative advantage Adaptability Trialability Complexity Design quality and packaging Cost 	Facilitators <ul style="list-style-type: none"> Providers have excellent knowledge of the service’s evidence and theoretical basis, as they developed the service based on findings from their earlier studies Strength of the evidence supporting the intervention Obstacles <ul style="list-style-type: none"> Service is implemented and managed by researchers who have many other responsibilities High perceived cost related to human resources and promotion of the service nation-wide 	Facilitators <ul style="list-style-type: none"> GIM protocol established by well-known and respected disability and LTPA researchers Trialability of the GIM protocol within a community-based organization and among other populations with physical disabilities Obstacles <ul style="list-style-type: none"> Complexity of the GIM protocol challenged implementation fidelity in a new context Poor perceived design and packaging of translated manual made its use unappealing by providers Relatively high cost (mainly human resources) related to initial adoption, implementation, and management 	Innovators foster ownership of the service
Outer setting Subdomains: <ul style="list-style-type: none"> Patient needs and resources Cosmopolitanism Peer pressure External policy and incentives 	Facilitators <ul style="list-style-type: none"> Financial support from partner organizations Obstacles <ul style="list-style-type: none"> Limited SCI population who may benefit/be interested in GIM Partner organizations perceive GIM implementation to be researchers’ responsibility 	Facilitators <ul style="list-style-type: none"> Initial close link with CIRRIS researchers Growing importance of LTPA for individuals with physical disabilities (important population in Québec City) Absence of similar services in Québec Obstacles <ul style="list-style-type: none"> Frailty of financial support from external sources 	Importance of a thoughtful plan for implementation
Inner setting Subdomains: <ul style="list-style-type: none"> Structural characteristics Networks and communication Culture Implementation climate Readiness for implementation 	Facilitators <ul style="list-style-type: none"> No turnover of SCI Action Canada researchers Presence of important expertise and resources – culture of innovation Researchers provide ongoing learning opportunities for counsellor Priority for SCI Acton Canada Obstacles <ul style="list-style-type: none"> Moderate turnover of counsellors 	Facilitators <ul style="list-style-type: none"> Dynamic nature of <i>Adaptavie</i> with staff turnover Culture of early adoption of the innovation Decision makers willingness to direct human and financial resources to implement the service in spite of other competing resource demands within the organization Obstacles <ul style="list-style-type: none"> One of many priorities for <i>Adaptavie</i> 	Innovators foster ownership of the service Innovators facilitate ongoing staff training and support Importance of a thoughtful plan for implementation
Characteristics of individuals Subdomains: <ul style="list-style-type: none"> Knowledge and beliefs about the intervention Self-efficacy Individual stage of change Individual identification with organization Other personal attributes 	Facilitators <ul style="list-style-type: none"> Strong individual and group beliefs about the value and effectiveness of the intervention Providers dedicated to meeting the scheduling needs of clients (e.g., on weekends, evening hours) Strong self-efficacy for providing an evidence-based service among providers Obstacles - none identified	Facilitators <ul style="list-style-type: none"> Strong individual and group beliefs about the value and effectiveness of the intervention facilitated initial adoption of the intervention <i>Adaptavie</i> staff were enthusiastic to offer a new innovation within their organization Obstacles <ul style="list-style-type: none"> Absence of individual knowledge about the theoretical foundation of the intervention 	Innovators foster ownership of the service Innovators facilitate ongoing staff training and support
Implementation process Subdomains: <ul style="list-style-type: none"> Planning Engaging Executing Reflecting and evaluating 	Facilitators <ul style="list-style-type: none"> Well-planned, progressive implementation process allowing for adaptation and improvement Presence of champions Constant opportunities for reflection and evaluation Obstacles – none identified	Facilitators – none identified Obstacles <ul style="list-style-type: none"> Absence of determined implementation strategy (information, training, feedback, etc.) Lack of resources and expertise Absence of opportunity for reflection and evaluation 	Innovators foster ongoing staff training and support Importance of a thoughtful plan for implementation

Note: CFIR, Consolidated Framework for Implementation Research (Damschroder et al., 2009); GIM, Get in Motion; LTPA, leisure-time physical activity; PAL, Passez à l’action



the protocol to the Adaptavie context and did not plan or deliver any long-term implementation activities.

Innovators facilitate on-going staff training and support

The strong presence of the GIM directors/researchers also provided a unique opportunity for the GIM staff to receive initial and on-going training and support in research evidence and behaviour change theories and techniques that are relevant to the service. As indicated by one of the GIM directors: “[The service coordinator, the counsellor, and I] meet every three weeks to ensure... what we want is happening in terms of counselling. So I guess I lead those meetings and it’s helpful for me to know. I know the theory behind the service, but does it work in practice?” Also as stated by the GIM counsellor, “last summer (...) we went through and did that intensive couple of weeks where we met every week and read through the research studies and the (theory) papers”. This training and support facilitated service implementation because it ensured the counsellor had a strong sense of self-efficacy for providing theory- and evidence-based counselling. It also provided an opportunity for the GIM counsellor and the service coordinator to evaluate and reflect on their delivery of the protocol, offering feedback about implementation fidelity and whether the “active ingredients”, or behaviour change techniques [29], embedded in the service were being delivered.

In contrast, the Adaptavie service coordinator and kinesiologist who offered the PAL service were not provided with continuous training and support from LTPA promotion experts, making it more difficult for them to maintain fidelity to the GIM protocol and to the theoretical principles informing the counselling intervention. In addition, the implementation strategy was not intensive and did not offer follow up neither opportunity for reflexivity. Thus, the PAL staff made modifications to the protocol to suit their context without consideration of the evidence and theoretical principles informing the service protocol (e.g., some clients were seen in person, others over the telephone; see table 1 for more examples). As stated by the Adaptavie manager, “The perception I got is that we can choose to turn right or left, at the end we modify it to fit our image and our reality, to make it work in our context”. The PAL staff did not have the same opportunity for self-evaluation and reflection about delivery of the protocol with the GIM researchers, and thus the small modifications made to the PAL protocol over time cumulated in a service that looks much different than the GIM protocol. These differences result from the fact that the GIM service is reflective of a research-driven protocol operating in a “real-world” context, whereas the PAL service was designed from the outset to be a “real-world” protocol whereby program delivery is tailored to the needs of each client. The impact of these differences is currently unknown and is an avenue for future research.

Importance of a thoughtful plan for implementation

The on-going training and support provided to the GIM staff is one component of the service’s thoughtful and well-developed implementation process. This process also includes the continual refinement of a protocol manual that exists as a “working document” (i.e., adaptations to the protocol are made as new research evidence emerges about promoting LTPA to persons with physical disabilities) as well as a rigorous monitoring of the implementation of each telephone session through Counselling Session Checklists ([30] (In preparation)). As discussed by the service coordinator: “(The counsellor) is able to work through this checklist that we have and touch on at least one or two theory-based components every (session). And so the person on the other end of the phone doesn’t even realize what’s happening but they set a LTPA goal with all of the components that [behaviour change experts] think should be in a LTPA goal, and to them, it was “I just chatted with (the counsellor)... So we have this really rich implementation data.”



The complex implementation process that was developed for GIM was not suitable for PAL. The differences in the complexity of the GIM and PAL implementation processes may be attributable to how long the services have been operating and the breadth of the target populations. GIM was established three years prior to PAL. During this time period, the GIM team had the opportunity to learn first-hand about the benefits and challenges of monitoring the service's implementation in order to better understand how the service was leading to changes in key outcomes [23]. Similar time and resources were not dedicated to the implementation of PAL (e.g., protocol manuals were initially translated, but not regularly refined; the implementation of client sessions were not monitored). Compared with the GIM staff, who were focused on a single disability group (i.e., SCI), the PAL staff were working with a more diverse population (i.e., adults with physical disabilities). Consequently, necessary changes were made to the GIM protocol to accommodate this diverse clientele, and thus, less attention could be devoted to PAL's implementation process: "We do it [evaluation], but rather informally. When something happened, we ask[ed] ourselves how we [could] have done it differently (...) but, truly, we are more in an action-reaction mode than in a reflective mode" (PAL kinesiologist). In a similar vein, the same implementation process that was adopted and used for GIM may not work for PAL given the differences in several of the CFIR domains between the two services (e.g., training and background of interventionists; service goals). Thus, it cannot be assumed that an implementation process for a service in one context will work in replication when the service is translated to a new context; a thoughtful plan for implementation needs to be created to meet the needs of the specific context and continuously updated for each iteration of the service. In addition, the intensive implementation protocol used for GIM could not be used for PAL, which might have had an impact on the resulting program. Indeed, using a limited number of meetings, despite with an opinion leader, might not be sufficient to insure the fidelity of the program implemented. Thus, the plan for implementation should consider the reported effectiveness of each implementation strategy and aim to optimize the implementation process.

Lessons learned and recommendations for future translation of evidence-based services in additional contexts

Together, these findings provide several lessons for teams who are working to implement applied behavioural interventions in a variety of contexts.

1. Credibility of the intervention is important for facilitating the service's adoption by other organizations: A key reason for Adaptavie's adoption of the GIM service protocol was that it was seen as an evidence-based service with a strong theoretical basis. The credibility and supporting evidence of an innovation (such as the GIM service protocol) are critical to its uptake within different contexts [25].

2. Two-way communication between the group that develops the service and the organization wishing to adopt and modify the service should be fostered, as this may promote greater ownership of the service. A participatory approach that involves both the service innovators and the new stakeholders in the modification of the protocol may enhance the feasibility, acceptability and "buy-in" of the service within a new context (e.g., [31]), and thus promote a culture that has high readiness for service implementation. Ideally, the group that develops a service would provide continued support to the adopting group. For example, the GIM researchers could have offered similar training in the theoretical underpinnings of the GIM protocol to the Adaptavie staff who run PAL as what is currently provided to the GIM staff, to ensure more consistent delivery of the service's theory- and evidence-based content. Unfortunately, this was not possible as the GIM researchers volunteer their time for the implementation of GIM, and did not have the resources to provide this on-going support. A mechanism should be put in place for continued communication between



the innovator setting and the new adopter setting (e.g., clear identification of a point person, such as the service coordinator, at the innovator setting who has time dedicated to answering questions and following up with service staff within the adopter setting).

3. Clear identification of the “active ingredients” of the service’s protocol is required to better understand which components of a protocol are to remain unchanged, and those which can be modified by the adopting organization to meet the needs of the context within which their service operates. For example, teaching clients behaviour change techniques like goal-setting and creating action plans will likely lead to greater LTPA participation regardless of whether it is done during sessions that are delivered over the telephone (as in GIM) or face-to-face (as in PAL) [19,32]. These “active ingredients” may be deciphered by examining and clearly describing the behaviour change techniques embedded within an existing service protocol [29], without consideration of delivery mode or interventionist characteristics. The adopter setting would be able to ensure that these “active ingredients” are included in their service’s protocol and implemented in a manner that is most feasible within their context.

4. Resources should be directed to thoughtful and continuous implementation of the service: Although the GIM implementation process is well-structured and can serve as a road map for other organizations who adopt the protocol, it should not be assumed that this protocol will work in a new setting without modification. The PAL team worked within their financial resources to adopt and implement the GIM service protocol to fit the Adaptavie context. This required the kinesiologist to modify the length and format of the intervention as well as to limit the time devoted to reflection and evaluation. It may be necessary for future organizations wishing to adopt the existing service protocols to have dedicated time and financial resources to the translation of the service to fit their context.

Based on these lessons learned, a new knowledge translation strategy for PAL has been created and implemented since 2014. This strategy is conjointly lead by an Adaptavie kinesiologist and a knowledge translation researcher, to combine expertise in both research and practice. Regular meetings have been established between the developers of GIM and PAL and the scientific knowledge translation team, and the Adaptavie kinesiologist has travelled to visit and learn from the original GIM program. The knowledge translation strategy itself involves a strong emphasis on the original GIM service, including its underlying theoretical framework, key behaviour change techniques, and 6-month counselling protocol. Some adaptations have been made to the format of the original GIM service manual (e.g., translation in French, addition of examples and pictograms to easier the reading and application) and evaluation tools (e.g., validation of the French version, development of a user-friendly visual format) to ensure that the refined PAL service better fits to the local Adaptavie context. The scientific evidences of the effectiveness of the original program were also used as a continuous argument to insure the greatest level of fidelity of implementation of the PAL program. This implementation strategy will continue over a 2-year period (2015 to 2017). Evaluation mechanisms have been put in place to measure the effectiveness of the new strategy and to measure the fidelity of the PAL intervention.

STUDY STRENGTHS AND LIMITATIONS

Our case study is innovative, since it allows for the comparison of the implementation of a similar service into two very different contexts. Both implementations were naturalistic (i.e., they occurred in a real-world context); thus allowing for the study of real life challenges?? that could arise when implementing GIM or PAL in other, similar contexts. Extensive efforts were made to invite all the providers of the two services to participate in the focus groups in order to gather an extensive and in-depth perspective



on the implementation of both GIM and PAL. Recruitment and data analysis were performed by individuals external to the two services, with data analysis following a deductive approach based on a the CFIR theoretical framework to ensure maximum objectivity.

However, there are some caveats to the study that warrant mention when interpreting the findings. One relates to the service providers who were not included in the focus groups. The original GIM counsellor and coordinator along with the initial PAL kinesiologist could not be contacted to participate in the focus groups; therefore, information about the initial uptake of the two services with respect to the interventionist's perspective is limited to only those individuals who were able to participate in these sessions. However, staff turnover is part of the nature of implementing interventions in applied settings where employment is offered on a part-time basis (e.g., GIM experienced a turnover in counselling staff in 2011). A second limitation concerns the nature of the study participants. One challenge with conducting this type of qualitative, applied translational research is that some of the authors of this study were engaged as research participants within the focus group sessions. This study was a reflective opportunity for the GIM team to critically appraise the implementation process of the GIM service protocol and its adoption within a different setting. However, the first author (MEL), whom is neither part of the GIM nor PAL teams, conducted all of the focus groups and the analyses, thereby reducing the chance of bias on part of the researchers.

CONCLUSION

Implementation of research evidence in applied settings is a challenge. Our experience, as shared through this multiple case study, provides further evidence of the complex nature of implementation. Differences in implementation between the GIM and PAL services may be attributed to the service in itself (e.g., its format, characteristics, attractiveness), to the internal and external environments in which these services operate (e.g., readiness of the settings, interventionists and partners to implement the service, presence of required infrastructure), to implementation processes (e.g., marketing of the program, presence of an opinion leader), or to the needs, characteristics, and beliefs of the clients who enrol in these services [25]. Little attention has been devoted to the replication of implementation to date, and it is therefore important that further research is conducted to identify the key elements that may determine successful implementation of evidence-based services in additional contexts.

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REFERENCES

1. World Health Organization. International Classification of Functioning, Disability, and Health. 2001. [Ref.: https://goo.gl/mfp9Pj](https://goo.gl/mfp9Pj)
2. Godin G, Shepherd RJ. A simple method to assess exercise behavior in the community. *Can J Appl Sports Sci.* 1985; 10: 141-146. [Ref.: https://goo.gl/0JWxyB](https://goo.gl/0JWxyB)
3. Cooper RA, Quatrano LA, Axelson PW, Harlan W, Stineman M, et al. Research on physical activity and health among people with disabilities: A consensus statement. *J Rehab Res Dev.* 1999; 36: 142-159. [Ref.: https://goo.gl/1eol6T](https://goo.gl/1eol6T)
4. Durstine JL, Painter P, Franklin BA, Morgan D, Pitetti KH, et al. Physical activity for the chronically ill and disabled. *Sports Med.* 2000; 30: 207-219. [Ref.: https://goo.gl/fKcqvV](https://goo.gl/fKcqvV)
5. Giacobbi PR, Stancil M, Hardin B, Bryant L. Physical activity and quality of life experienced by highly active individuals with physical disabilities. *Adapt Phys Activ Q.* 2008; 25: 189-207. [Ref.: https://goo.gl/QYAoCL](https://goo.gl/QYAoCL)
6. Heath GW, Fentem PH. Physical activity among persons with disabilities: A public health perspective. *Exercise Sport Sci Rev.* 1997; 25: 195-233. [Ref.: https://goo.gl/bb9ll5](https://goo.gl/bb9ll5)
7. Tomasone JR, Wesch N, Martin Ginis KA, Noreau L. Spinal cord injury, physical activity, and quality of life: A systematic review. *Kinesiol R.* 2003; 2: 113-129. [Ref.: https://goo.gl/YVvmtgh](https://goo.gl/YVvmtgh)
8. Statistics Canada. Participation and Activity Limitation Survey 2001. Ottawa, Ontario
9. Rimmer JH, Riley B, Wang E, Rauworth A, Jurkowski J. Physical activity participation among persons with disabilities: barriers and facilitators. *Am J Prevent Med.* 2004; 26: 419-425. [Ref.: https://goo.gl/RmJQOg](https://goo.gl/RmJQOg)
10. Ginis KA, Latimer-Cheung A, Corkum S, Ginis S, Anathasopoulos P, et al. A case study of a community-university multidisciplinary partnership approach to increasing physical activity participation among people with spinal cord injury. *Transl Behav Med.* 2015; 2: 516-522. [Ref.: https://goo.gl/7fn82k](https://goo.gl/7fn82k)
11. Arbour-Nicitopoulos KA, Martin Ginis KA, Latimer AE. Planning, leisure-time physical activity, and coping self-efficacy in persons with spinal cord injury: a randomized controlled trial. *Arch Phys Med Rehab.* 2009; 90: 2003-2011. [Ref.: https://goo.gl/8td4l8](https://goo.gl/8td4l8)
12. Latimer AE, Martin Ginis KA, Arbour KA. The efficacy of an implementation intention intervention for promoting physical activity among individuals with spinal cord injury: a randomized controlled trial. *Rehabil Psychol.* 2006; 51: 273-280. [Ref.: https://goo.gl/fVI2gy](https://goo.gl/fVI2gy)
13. Arbour-Nicitopoulos KP, Martin Ginis KA, Latimer-Cheung AE, Bourne C, Campbell D, et al. Development of an evidence-informed leisure time physical activity resource for adults with spinal cord injury: the SCI Get Fit Toolkit. *Spinal Cord.* 2013; 51: 491-500. [Ref.: https://goo.gl/tZJUfq](https://goo.gl/tZJUfq)
14. Latimer-Cheung AE, Arbour-Nicitopoulos KP, Brawley LR, Gray C, Justine Wilson A, et al. Developing physical activity interventions for adults with spinal cord injury. Part 2: Motivational counseling and peer-mediated interventions for people intending to be active. *Rehabil Psychol.* 2013; 51: 273-280. [Ref.: https://goo.gl/0A4vyX](https://goo.gl/0A4vyX)
15. Martin Ginis KA, Hicks AL, Latimer AE, Warburton DER, Bourne C, et al. The development of evidence-informed physical activity guidelines for adults with spinal cord injury. *Spinal Cord.* 2011; 49: 1088-1096. [Ref.: https://goo.gl/kUZRIq](https://goo.gl/kUZRIq)
16. Michie S, Abraham C, Whittington C, McAteer J, Gupta S. Effective techniques in healthy eating and physical activity interventions: A meta-regression. *Health Psychol.* 2009; 28: 690-701. [Ref.: https://goo.gl/OZLmP0](https://goo.gl/OZLmP0)
17. Michie S, Johnston M. Theories and techniques of behaviour change: developing a cumulative science of behaviour change. *Health Psychol R.* 2012; 6: 1-6. [Ref.: https://goo.gl/z0OzH0](https://goo.gl/z0OzH0)
18. Martin Ginis KA, Latimer AE, Arbour-Nicitopoulos KP, Bassett RL, Wolfe DL, et al. Determinants of physical activity among people with spinal cord injury: A test of social cognitive theory. *Ann Behav Med.* 2011; 42: 127-133. [Ref.: https://goo.gl/aKe045](https://goo.gl/aKe045)
19. Martin Ginis KA, Tomasone JR, Arbour-Nicitopoulos KA, Bassett-Gunter RL, et al. Developing physical activity interventions for adults with spinal cord injury. Part 1: A comparison of social cognitions across actors, intenders, and non-intenders. *Rehabil Psychol.* 2013; 58: 299-306. [Ref.: https://goo.gl/Gqoi1C](https://goo.gl/Gqoi1C)



20. Cowan RE, Nash MS, Andersen KD. Exercise participation barrier prevalence and association with exercise participation status in individuals with spinal cord injury. *Spinal Cord*. 2013; 51: 27-32. [Ref.: https://goo.gl/uc7dIA](https://goo.gl/uc7dIA)
21. Eakin EG, Lawler SP, Vandelanotte C, Owen N. Telephone interventions for physical activity and dietary behavior change: a systematic review. *Am J Prev Med*. 2007; 32: 419-434. [Ref.: https://goo.gl/agveaO](https://goo.gl/agveaO)
22. Arbour-Nicitopoulos KA, Tomasone JR, Latimer-Cheung AE, Martin Ginis KA. Get In Motion: An evaluation of the reach and effectiveness of a physical activity telephone counseling service for Canadians living with spinal cord injury. *PM R*. 2014; 6: 1088-1096. [Ref.: https://goo.gl/ofya60](https://goo.gl/ofya60)
23. Statistics Canada. Census in brief: French and the francophonie in Canada. Catalogue no.98-314-X2011003. 2012. [Ref.: https://goo.gl/GdUchC](https://goo.gl/GdUchC)
24. Yin RK. Case study research: Design and methods (4th ed. Vol. 5). Thousand Oaks, CA: SAGE. 2009.
25. Damschroder L, Aron D, Keith R, Kirsh S, Alexander J, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009; 4: 50. [Ref.: https://goo.gl/p9teG1](https://goo.gl/p9teG1)
26. Effective Practice and Organisation of Care (EPOC). EPOC Taxonomy. 2015. [Ref.: https://goo.gl/O1AiwC](https://goo.gl/O1AiwC)
27. CFIR Research Team. Consolidated Framework for Implementation Research: Interview Guide Tool. 2015.
28. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006; 3: 77-101. [Ref.: https://goo.gl/3ye2t6](https://goo.gl/3ye2t6)
29. Michie S, Richardson M, Johnston M, Abraham C, Francis J, et al. The Behavior Change Technique Taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Ann Behav Med*. 2013; 46: 81-95. [Ref.: https://goo.gl/Btkgbv](https://goo.gl/Btkgbv)
30. Tomasone JR, Arbour-Nicitopoulos KP, Latimer-Cheung AE, Estabrooks PA, Martin Ginis KA. (Unpublished). Get in Motion 2.0: Understanding the population impact of a telephone-based physical activity counseling service using a full RE-AIM evaluation.
31. Tomasone JR, Martin Ginis KA, Estabrooks PA, Domenicucci L. Changing Minds, Changing Lives from the top down: An investigation of the dissemination and adoption of a nationwide educational intervention to enhance health care professionals' intentions to prescribe physical activity. *Int J Behavioral Med*. 2015; 22: 336-343. [Ref.: https://goo.gl/Hx6XGy](https://goo.gl/Hx6XGy)
32. Schwarzer R. Modeling health behavior change: how to predict and modify the adoption and maintenance of health behaviors. *Applied Psychol*. 2008; 57: 1-29. [Ref.: https://goo.gl/FpBqrf](https://goo.gl/FpBqrf)