Videoconference-Delivered Physical Activity Peer Support Programs for Adults with Spinal Cord Injury: A Receptivity Survey and Pilot-Test

by

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A thesis submitted in conformity with the requirements for the degree of Master of Science,
Graduate Department of Exercise Sciences,
in the University of Toronto

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University of Toronto
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Abstract

Videoconference-based physical activity support (VPAS) is a novel method for overcoming time and space barriers to receiving peer support among persons with spinal cord injury (SCI). This thesis examines the receptivity towards VPAS (Study 1) and the feasibility, acceptability and usefulness of a VPAS pilot program (Study 2) in a sample of adults with SCI. An online questionnaire assessing needs, preferences and barriers towards VPAS was administered to 30 LTPA intenders and actors with SCI (Study 1). Nine of the survey respondents took part in the VPAS program; consisting of four, weekly 60-minute group Skype® sessions (Study 2). The majority of survey respondents (60%) expressed interest in the four-week VPAS program. PA level and age characterized videoconference participation and family and work commitment barriers, respectively. Overall, the pilot program demonstrated a modest level of feasibility; and high acceptability and usefulness. Taken together, group-based videoconferencing holds promise for delivering PA-enhancing interventions.
I would like to express my sincere gratitude to everyone who has played a pivotal role in the final product of my thesis. Over the past two years, I have been fortunate to work with individuals who have shown me how to use the tools to succeed in graduate school. Moreover, it is these individuals who have not only contributed to the foundation of this document but also to the person I have become today.

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<tr>
<td>e-SMART</td>
<td>exercise-Self-Management Assistance in Real-Time</td>
</tr>
<tr>
<td>GMCB</td>
<td>group-mediated cognitive behavioural</td>
</tr>
<tr>
<td>HAPA</td>
<td>health action process approach</td>
</tr>
<tr>
<td>ICP</td>
<td>Internet-based communication platform</td>
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<tr>
<td>LTPA</td>
<td>leisure-time physical activity</td>
</tr>
<tr>
<td>LTPAQ-SCI</td>
<td>Leisure-Time Physical Activity Questionnaire for Adults with Spinal Cord Injury</td>
</tr>
<tr>
<td>MVPA</td>
<td>moderate-to-vigorous physical activity</td>
</tr>
<tr>
<td>OE</td>
<td>outcome expectancy</td>
</tr>
<tr>
<td>PA</td>
<td>physical activity</td>
</tr>
<tr>
<td>PAG-SCI</td>
<td>Physical Activity Guidelines for Adults with Spinal Cord Injury</td>
</tr>
<tr>
<td>PARA-SCI</td>
<td>Physical Activity Recall Assessment for People with Spinal Cord Injury</td>
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<tr>
<td>SCI</td>
<td>spinal cord injury</td>
</tr>
<tr>
<td>SCT</td>
<td>social cognitive theory</td>
</tr>
<tr>
<td>SE</td>
<td>self-efficacy</td>
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<tr>
<td>SRE</td>
<td>self-regulatory efficacy</td>
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Glossary of Terms

**Actors** refer to individuals who are engaging in the intended behaviour specified (Schwarzer, 2008a).

**Brainstorming (virtual)** is a group collaborative activity that encourages all members of a group to provide input (i.e., words or phrases) on a specified topic via instant messaging (Nazzaro & Strazzabosco, 2009).

**Buddy system** is a method of developing a social bond among peer members outside of a structured program to facilitate a continued learning process and community engagement (Kabaroff et al., 2012).

**Deindividuation** is the process of being immersed into a group that allows an individual to interact with others and maintain a sense of anonymity, thereby providing greater freedom of expression without perceived consequence, and furthermore, control of his/her social identity (McKenna & Green, 2002).

**Exploratory** refers to identifying the key characteristics of a specified task, issue or event in a field of study and/or population that is limited in knowledge to set any hypotheses apriori (Stebbins, 2001).

**Feasibility** refers to the extent to which a proposed undertaking can be successfully performed with the available resources and under practical conditions (Bowen et al., 2009).

**Fidelity** refers to the extent to which the outlined dose and content of the proposed undertaking is delivered as intended (Carroll et al., 2007).

**Go-rounds (virtual)** is a group collaborative activity that involves an ordered sequence of participation by each group member in a specific discussion (Nazzaro & Strazzabosco, 2009).

**Group cohesion** refers to the extent to which a group of individuals are united and motivated to work together and collaborate to meet a common instrumental and affective goal (Carron et al., 1998).
**Group dynamics** is a multidimensional study of the nature and development of groups and the interrelationship between groups, individuals, and larger institutions (Cartwright & Zander, 1968).

**Informal peer groups** are composed of a set of individuals with equal status, share similar interests and are working towards a common goal without the guidance from a trained counsellor or peer mentor (Borkman, 1976).

**Instant messaging** is a virtual collaborative function (i.e., videoconference function) that allows for an exchange of text-based communication between two or more individuals in real-time (“Skype”, 2015).

**Intenders** refer to individuals who aim to perform the specified behaviour in the near future (Schwarzer, 2008a).

**Normative beliefs** refer to cognitive evaluations on behaviours and consequences as a result of social influence (Göckeritz, Schultz, Rendón, Cialdini, Goldstein, & Griskevicius, V., 2010).

**Participation** is a construct associated with quality of life and refers to the level of involvement in life situations based on one’s physical, emotional and social capabilities (“WHO”, 2002).

**Pilot-testing** is the initial assessment stage of determining the feasibility of implementing a larger-scale intervention (van Teijlingen, & Hundley, 2001).

**Private discussion (videoconference)** is a small group-based collaborative activity that provides group members the opportunity to discuss a specified topic, excluding the group facilitator via audio mute and video disconnect.

**Program acceptability** refers to the extent to which members are satisfied and engage in the program tasks (Bowen et al., 2009).

**Program usability** refers to the extent to which a particular interface (i.e., videoconference software) enables users to perform tasks easily and efficiently at the initial introduction and after an extended period of inactivity with minimal errors or complications (Nielsen, 2012).
**Program usefulness** refers to two key quality attributes of a program interface that facilitates learning and collaboration: 1) usability; and 2) utility (Nielsen, 2012).

**Program Utility** refers to the functionality of the user interface, or the extent to which the functions of the interface meets the user’s contextual needs (Nielsen, 2012).

**Quality of life** is the extent to which an individual can sufficiently participate in society as determined objectively or subjectively (Dijkers, 2005).

**Receptivity** refers to the extent to which an individual is willing and/or capable of accepting and participating in a specified product or action (Kim & Kim, 2001).

**Screen sharing** is a videoconference-based collaborative function that allows a user to share his/her computer screen (either his/her current window or entire screen) with the rest of the group members (“Skype”, 2015).

**Self-management** refers to the act of exercising control over one’s behaviour through the use of various motivational and self-regulatory skills (Bandura, 2005).

**Self-regulation** encompasses a set of cognitive (e.g., scheduling and barrier self-efficacy) and behavioural (e.g., goal-setting, action planning) processes that facilitate behaviour change (Bandura, 1997; Bandura, 2004).

**Social needs** refer to interaction and communication among close and meaningful personal relationships (McKenna & Green, 2002).

**Task needs** refer to the attainment of a tangible goal (McKenna & Green, 2002).

**Virtual** is a state of being whereby interactions with other persons and things are perceived under a real or imagined environment (Steuer, 2013).
Chapter 1
Review of the Literature

1 Review of literature

1.1 Overview of spinal cord injury

1.1.1 Spinal cord injury defined

A spinal cord injury (SCI) involves a lesion within the spinal cord, leading to the disruption of nerve fiber bundles responsible for regulating ascending sensory and/or descending motor information (Furlan, Krassioukov, Miller & Sakakibara, 2012; Raineteau & Schwab, 2001; Kraus, Franti, Riggins, Richards & Borhani, 1975). This may result from either a traumatic (e.g., motor vehicle accident or fall) or non-traumatic (e.g., acquired spinal tumor or spina bifida) event (Noreau, Adair, Boschen, Clarke, Jacquemin, Martin Ginis, et al., 2011). These two categories of SCI etiology present distinctive epidemiology, demographic, injury level and severity characteristics, and recovery processes (Furlan et al., 2012).

Traumatic SCI is most prevalent among males (74.3%; Farry & Baxter, 2010) and is typically acquired among young adults (e.g., under 40 years old [Pickett, Campos-Benitez, Keller & Duggal, 2006]); whereas a non-traumatic SCI is typically diagnosed among older, married, and retired females (McKinley, Seel, Gadi & Tewksbury, 2001). Based on the location and extent of nerve fiber damage, an SCI is classified as either a full (complete) or partial (incomplete) lesion, leading to paralysis in the legs and trunk (paraplegia) or in more severe cases, all four limbs and trunk (tetraplegia) (“Living with spinal cord injury,” n.d., para. 1-3). An SCI imposes greater impairment when damage occurs higher in the spinal cord, with functional impairment found at or below the level of the lesion (“Living with spinal cord injury,” n.d., para. 6-10). The standard classification system consists of five grades of injury: i) complete, ii) sensory incomplete, iii) motor incomplete (more than 50% of muscle function graded less than 3), iv) motor incomplete (at least 50% of muscle function grades more than or equal to 3), and v) normal (full restoration of sensory and motor function) (“International Standards for Neurological Classification of Spinal Cord Injury”, 2014). In general, individuals with a traumatic SCI experience a greater
severity of injury than those with non-traumatic injuries ("Non-traumatic SCI," n.d., para. 2; McKinley, Seel & Hardman, 1999; McKinley, Tewksbury & Godbout, 2001a; McKinley, Tewksbury & Mujteba, 2001b), with some reports indicating that approximately 56% of traumatic SCI cases result in tetraplegia ("Traumatic SCI," n.d., para. 2; National Trauma Registry, 1999). Furthermore, McKinley and colleagues (1999) reported that within their sample of 220 individuals with an SCI, 11% of individuals with a traumatic SCI had tetraplegia; no cases of tetraplegia were found among adults with non-traumatic SCI.

The distinct differences between traumatic and non-traumatic aetiologies appear to have a significant impact on the recovery process, whereby those with a traumatic SCI spend a longer time in rehabilitation (McKinley et al., 2001). However, McKinley and colleagues (2001) state that upon discharge, the level and severity of an SCI presents a significant influence on the individual’s quality of life regardless of etiology. Research has shown that the greater the severity of the injury, the more challenging it is to engage in leisure-time PA (LTPA), which is defined as any form of physical activity that takes place during an individual’s free time (Martin Ginis, Latimer, Arbour-Nicitopoulos, Buchholz, Bray, Craven, et al., 2010). The relationship between injury severity and LTPA is often influenced by the amount of assistance and specialized equipment an individual requires to participate within their community (Martin Ginis et al., 2010; Scelza, Kalpakjian, Zemper & Tate, 2005).

1.1.2 Epidemiology of spinal cord injury

In 2010, Canadian estimates of the incidence and prevalence of SCI was 4,300 and 86,000 cases per million, respectively, with approximately 44,000 individuals representing the traumatic SCI population at any given time (Farry & Baxter, 2010). The demographic profile of the Canadian SCI population (both traumatic and non-traumatic) is estimated within this report (Farry & Baxter, 2010) to be mostly males (74.3%) living in urban-dwelling regions (80%; versus 20% rural residents), with a large proportion of Canadians living in the province of Ontario (55.7-69.2%). According to the reports from the recent Canadian Spinal Cord Injury Community Health Survey that assessed 1,549 adults (minimum 18 years of age) with SCI (Noreau et al., 2011), a large proportion of the survey respondents reported remaining single (29.4%) following
their injury or being widowed/separated/divorced (18.2%), compared to 51.5% of survey respondents reported being married or in a common-law relationship. Meanwhile, a bimodal age distribution clearly illustrates the prevalence of SCI according to cause. Falls and motor vehicle collisions are the most prevalent causes of SCI in North America (Furlan et al., 2012). Fall-related causes are becoming increasingly common within older age groups (65+ years old) (Couris, Guilcher, Munce, Fung, Craven, Verrier, et al., 2010; Furlan et al., 2012), while motor vehicle collisions are most commonly reported among young adults between the ages of 19 and 30 years (Furlan et al., 2012; Pirouzmand, 2010). These age-related predictors of SCI etiology have implications for functional status and life expectancy.

Despite the trend of increasing life expectancy within the SCI population (DeVivo, Stuart Krause & Lammertse, 1999; Strauss, DeVivo, Paculdo & Shavelle, 2006), the current estimated plateau in survival occurs in the mid-50’s age range as a result of functional decline (DeVivo et al., 1999). The most significant factors for increased life expectancy are level and severity of SCI, as well as age at injury onset (DeVivo & Chen, 2011). Those who acquired their injury at a younger age and have minimal functional motor loss are more likely to live a longer life (DeVivo & Chen, 2011). Most of these individuals who live to old age (i.e., 65+ years) report higher levels of independence, social participation, and well-being (DeVivo & Chen, 2011). However, accelerated aging remains a large concern for many persons with SCI as a result of reduced ability to cope with SCI-related stress (“SCI forum report & video: Aging with a spinal cord injury”, 2009). This specific stress is predominately associated with secondary health complications that occur more frequently among persons with SCI than the general population (Jensen Truitt, Schomer, Yorkston, Baylor & Molton, 2013).

1.1.3 Secondary health complications associated with spinal cord injury

Quality of life within the SCI population is measured according to the extent to which an individual is afflicted with physical and/or psychological health conditions, either directly or indirectly associated with their disability or impairment (Hitzig, Noreau, Balioussis, Routhier, Kairy & Craven, 2013). The most common health complications among persons with an SCI (both traumatic and non-traumatic) are: autonomic dysreflexia (e.g. sudden increase or recurrence of high blood pressure, in combination with other cerebrovascular and cardiovascular...
symptoms such as headache and slow heart rate), bladder and bowel dysfunction (e.g. urinary tract infection and constipation), bone complications (e.g. fractures, osteoporosis), pain (e.g. neuropathic, musculoskeletal), pressure ulcers, respiratory complications, and spasticity Hitzig et al., 2013; Hitzig, Tonack, Campbell, McGillivray, Boschen, Richards et al., 2008).

Based on findings from the Canadian Spinal Cord Injury Community Health Survey (Noreau et al., 2011), sexual dysfunction was the most frequently reported health condition (79%) for individuals with traumatic SCI ($N = 1137$), and was perceived to have the greatest impact on daily activities, irrespective of injury level or severity. Other frequently reported secondary health conditions within this sample of individuals with traumatic SCI include: neuropathic pain (78%), shoulder problems (73%), and urinary tract infections (58%) (Noreau et al., 2011). Given the prevalence of pressure ulcers (at least to cases within the last 12 months; 15%) experienced among individuals with traumatic SCI, it is important to note that 43% of this group perceived their condition to be debilitating to their daily activities (Noreau et al., 2011). Furthermore, these individuals most commonly suffered from a complete spinal lesion (Noreau et al., 2011).

Fortunately, many individuals with an SCI learn over time how to cope with and adapt to these secondary health complications, as evident in the decreasing frequency in reports of activity limitations from 7.5 to 30 years and greater post-injury (Noreau et al., 2011). These learned coping mechanisms may be positive (Löfgren, & Norrbrink, 2012), however there are many instances where individuals with SCI avoid engaging in certain activities (e.g., LTPA, range of motion) due to the presence of secondary health complications, in particular neuropathic pain (Molton, Stoelb, Jensen, Ehde, Raichle, & Cardenas, 2009).

Considering that the ultimate goal of SCI recovery is well-being and social participation (Craig, Nicholson Perry, Guest, Tran, & Middleton, 2015), it is crucial that individuals with an SCI acquire the self-management skills to engage in healthy lifestyle behaviours, such as LTPA. LTPA has been shown to prevent the incidence and debilitating nature of secondary health complications that adults with SCI are often faced with, thereby maintaining one’s independence (Munce, Fehlings, Straus, Nugaeva, Jang, Webster, et al., 2014; Noreau & Shephard, 1995; Kroll, Neri, & Ho, 2007; Tawashy, Eng, Lin, Tang, & Hung, 2009). Furthermore, a self-managed healthy and active lifestyle ensures the prevention of chronic
diseases associated with natural aging, such as cardiovascular disease and obesity (Noreau & Shephard, 1995). The next chapter will provide an up-to-date synthesis of the literature describing the recommended amount of LTPA to gain the associated fitness benefits tailored specifically for the SCI population.

1.2 Review on spinal cord injury and leisure-time physical activity

1.2.1 Current leisure-time physical activity levels within the spinal cord injury population

LTPA participation has a profound impact on social participation, life satisfaction and overall quality of life following SCI rehabilitation (Tomasone, Wesch, Martin Ginis, & Noreau, 2013). LTPA also provides many physical and psychological health benefits to individuals with SCI, which contribute to an active lifestyle throughout the life course including: increased functional capacity (Durán, Lugo, Ramírez, & Lic, 2001), improved upper body bone density (Noreau, Shephard, Simard, Pare, & Pomerleau, 1993; Jones, Legge, & Goulding, 2002), enhanced aerobic fitness (Dallmeijer, & Van der Woude, 2001), muscle strength (Ragnarsson, 1995, pp. 79-99), and reduced stress levels (DeVivo & Stover, 1995, pp. 289-317). Additionally, LTPA has been shown to reduce pain (Hicks et al., 2003) and prevent the development of the aforementioned secondary health conditions that are often faced by individuals with SCI (e.g., Scelza, Kalpakjian, Zemper, & Tate, 2005).

In 2011, a Canadian expert panel developed the first-ever Physical Activity Guidelines (PAGs) for adults with SCI (Martin Ginis, Hicks, Latimer, Warburton, Bourne, Ditor, et al., 2011). The expert panel followed a six-step, systematic process to ensure objective assessment and implementation of recommendations based on the highest quality evidence and stakeholder needs (Martin Ginis, Hicks, et al., 2011). The guideline development framework (Martin Ginis, Hicks, et al., 2011) consisted of 1) maintaining appropriate clinical scope and purpose for the defined target population; 2) contribution from SCI consumers; 3) collecting and synthesizing high quality evidence; 4) clear and representative language, format and implementation; 5) assessing organizational and financial implications; and 6) controlling for potential expert
contribution biases. This development process took into consideration such demographic factors as age, cause and level of injury. Based on the available scientific evidence, the PAGs were appropriately designed for fitness-related benefits (e.g. muscle strength and aerobic capacity) for those adults (ages 18-64 years) living with a traumatic injury, and either tetraplegia or paraplegia (Martin Ginis, Hicks, et al., 2011) and consist of the following recommendations: a minimum of 20 minutes of moderate-to-heavy intensity aerobic activity two times per week, and three sets of whole body strength training exercises, consisting of 8-10 repetitions, two times per week (Martin Ginis, Hicks, et al., 2011). There was insufficient evidence to conclude that the PAGs are associated with body composition and functional performance benefits (Martin Ginis, Hicks, et al., 2011).

Despite the fitness benefits that the PAG-SCI has to offer to the adult SCI population, approximately 50% of the Canadian SCI population do not engage in any form of LTPA within their daily routine (Martin Ginis, Latimer, Arbour-Nicitopoulos, Buchholz, Bray, Craven, 2010). This level of physical inactivity is approximately 12% greater than what is typically reported within the able-bodied population (38%; Craig & Cameron, 2004; Martin Ginis, Arbour-Nicitopoulos, Latimer-Cheung, Buchholz, Bray, Craven, et al., 2012). In particular, the average amount of time adults with SCI report engaging in any LTPA is only about 27 minutes per day (SD±49.36 min/d), with the majority of time spent in moderate-intensity LTPA (mean ± SD, 25.49±42.11 min/d), followed by mild-intensity (mean ± SD, 19.14±37.77 min/d) and heavy-intensity (mean ± SD, 10.52±22.17 min/d) activities (Martin Ginis et al., 2010). These intensity categories are based on the validated, SCI-specific Physical Activity Recall Assessment for People with Spinal Cord Injury (PARA-SCI; Martin Ginis, Latimer, Hicks & Craven, 2005), which defines moderate intensity LTPA as 40–59% maximum oxygen consumption or a resistance load of 50–69% of 1 repetition maximum (RM), mild intensity LTPA as 20-39% maximum oxygen consumption or a resistance load of 30-49% of 1 RM, and heavy intensity LTPA as greater than 60% maximum oxygen consumption or a resistance load of greater than 70% of 1 RM. Using these intensity values as standard comparisons, research has shown that LTPA patterns within the SCI population vary greatly on a weekly basis, often as a result of the reoccurring barriers to LTPA and secondary health conditions (Sweet et al., 2012; Martin Ginis et al., 2005). Sweet et al. (2012) investigated the LTPA trajectories among community-dwelling
adults with SCI within an 18-month period and found four main categories: decreaser (32%), stable active (32%); inactive (22%), and increaser (14%). A significant linear trend was identified among the ‘increaser’ and ‘decreaser’ trajectory categories, indicating that LTPA participation is variable for a large proportion of the SCI population. No significant change in LTPA was shown for the 32% of participants within the ‘inactive’ trajectory category (Sweet et al., 2012).

In terms of the types of LTPA that community-dwelling adults with SCI engage in, resistance training is the most common (33%), followed by aerobic exercise (25%), and wheeling (24%) (Martin Ginis et al., 2010). The greatest amount of time adults with SCI spend in LTPA is during craftsmanship ($M = 83.79 \pm 96.00$ min/d) and sports activities ($M = 60.86 \pm 59.76$ min/d) (Martin Ginis et al., 2010).

Overall, physical inactivity is of great concern within the SCI population. While there are many adults with SCI who engage in LTPA, their activity levels are quite variable, with the majority of participants spending their time in mild-to-moderate intensity LTPA. One potential reason for this variability is the SCI-related secondary health complications (e.g. pressure ulcers) that are perceived to hinder LTPA access and performance.

### 1.2.2 Barriers to leisure-time physical activity for adults with spinal cord injury

While secondary health complications may impose a challenge to engaging in LTPA, there are several negative health consequences to leading a physically inactive lifestyle. Indeed, research has demonstrated that inactivity contributes to a reduction in physical capacity, as well as an increase in secondary health conditions and chronic diseases (Martin Ginis et al., 2010). Specifically among individuals with SCI, a sedentary lifestyle poses a significantly greater risk for cardiovascular disease and obesity (Martin Ginis et al., 2012), as well as chronic pain (Ditor et al., 2003; Tawashy et al., 2009; Hicks et al., 2003; Latimer et al., 2004; Martin Ginis et al., 2003). The barriers most commonly expressed by individuals with SCI often act as contributing factors for the fluctuating LTPA levels observed within this population (Sweet et al., 2012; Martin Ginis et al., 2005). A comprehensive health promotion and disease prevention agenda in
the United States (US Department of Health and Human Services, 2000) reported that more disabled (55%) compared to able-bodied (43%) individuals experience barriers to LTPA (Scelza et al., 2005). Findings from numerous LTPA studies within the SCI population appear to support this claim (e.g., Williams, 2014; Scelza et al., 2005; Vissers et al., 2008; Kehn et al., 2009). For example, Scelza and colleagues’ (2005) well-cited study reported that despite the best of intentions to participate in a LTPA program, 47.2% of intenders with SCI (i.e., individuals who plan on engaging in LTPA in the near future; Schwarzer, 2008a) remained inactive potentially as a result of being challenged with three forms of perceived barriers: (1) intrapersonal or intrinsic; (2) limited resources; and (3) structural/architectural. The intrapersonal or intrinsic barriers were defined as psychological in nature and included factors such as lack of motivation (54.2%), energy (41.7%) and/or interest (33.3%) (Scelza et al., 2005; Williams et al., 2014). A lack of financial resources to afford LTPA programs (40.3%), and limited knowledge of LTPA program locations (36.1%) were reported by many individuals, while structural and/or architectural barriers that are reported to inhibit LTPA (e.g. transportation to LTPA facilities [8.3%] and knowledgeable LTPA instructors [48.6%]) were also identified as significant barriers to LTPA (Scelza et al., 2005; Williams et al., 2014).

Furthermore, within the sample, injury severity was found to influence perceived barriers to LTPA, whereby individuals with tetraplegia (in comparison to those with paraplegia) perceived their health conditions to impede their LTPA participation (38.5% vs. 14.7%) and that LTPA was too difficult (26.9% vs. 5.9%) (Scelza et al., 2005; Williams et al., 2014). Taken together, these findings suggest that SCI-specific barriers to LTPA participation arise from an interplay between personal and societal factors.

Given that the level and extent of injury severity plays a large role in how individuals with SCI perceive barriers to engaging in LTPA, research has directed its attention to the best strategies for enhancing motivation and access to community-based LTPA-related resources to help alleviate the negative effects of a SCI. Previous qualitative research investigating the life experiences of individuals with SCI have shown that having the opportunity to gain access to an ‘embodied source of knowledge’ (Mazanderani, Locock & Powell, 2013, p. 897) from fellow SCI peers in a sport or exercise setting is highly valued and can therefore enhance intrapersonal characteristics (e.g., self-efficacy, self-esteem and motivation) and social characteristics (i.e.,
community reintegration and identity) that are shown to facilitate LTPA participation (Williams et al., 2014). While Williams and colleagues (2013) state that peer mentorship can play a motivating role in developing positive outcome expectancies towards LTPA participation (e.g., increased physical and social independence), additional efforts should be taken to improve environmental accessibility in order to support positive intentions to engage in LTPA. One such strategy is targeting physical environmental barriers that have been shown to inhibit LTPA participation, such as lack of transportation (Kehn and Kroll, 2009; Smith, 2013; Stephens et al., 2012; Wahman et al., 2006). Lack of transportation can be impacted by the level of injury (i.e., greater for those with tetraplegia vs. paraplegia) and the number of years post-injury (i.e., greater vs. fewer number of years post-injury are more affected by transportation barriers) (Noreau et al., 2011). Furthermore, decreased perceptions of relatedness and connection to others within one’s community (especially in rural areas) can have an effect on transportation resources, leading to feelings of isolation, discomfort and a lack of motivation to engage in community-based LTPA programs (Dattilo et al., 1998). As such, Williams and colleagues (2013) suggest, based on previous literature examining perceptions of the physical environment on LTPA participation, that the use of social support networks (e.g., peers, family and disability groups) can help overcome this type of physical environmental barrier common in the SCI population (Cohen, Underwood, & Gottlieb, 2000; Levins et al., 2004; Martin et al., 2002; Price et al., 2011; Smith, 2013; Stephens et al., 2012).

To account for these three types of LTPA barriers (i.e., intrapersonal, social resources and environment), a novel avenue of intervention research for enhancing community reintegration and increased LTPA participation within the SCI population is real-time, videoconference-delivered self-management programs. This mode of program delivery has the potential to address the need expressed within the SCI population for social integration (Price, Stephenson, Krantz & Ward, 2011; Stephens et al., 2012; van de Ven, Post, de Witte & van den Heuvel, 2008) and increased self-efficacy and motivation for LTPA (Kehn & Kroll, 2009; Löfgren & Norrbrink, 2012; Martin et al., 2002; O’Brien et al., 2008) by providing a safe, friendly, and accessible LTPA environment. One recent example of such an intervention is an online, real-time 45-60 minute seated aerobics group program delivered to four groups of adults with SCI ($N = 19$), twice per week for a total of 9 weeks by a trained instructor with expertise in seated
aerobics (Wolfe, Ravenek, Chapman, Fraser, Legassic & Walia, 2012). Within the preliminary results ($n = 9$), Wolfe and colleagues (2012) reported that most participants were extremely satisfied with their general experience and the quality of group class instruction; as well as greater levels of preferences for live fitness classes compared to previous face-to-face classes. However, there was less reception towards the functionality (i.e., utility) of the videoconference and monitoring technologies (Wolfe et al., 2012). Additional reported analyses (Wolfe, Walia, Chapman, Ravenek, Chapman, Fraser, Askes, 2013) reported positive overall satisfaction with the physical and psychological effects of the program ($N = 13; M = 3.8 \pm 0.4$ out of 4). Despite the positive feedback provided by the group members following their participation in the videoconference-delivered fitness classes (Wolfe et al., 2013), there still remains speculation as to whether a virtual fitness class can foster initiation and long-term adherence to LTPA. As such, further research is required to evaluate the receptivity, feasibility, acceptability and utility of using videoconference as an intervention modality for delivering training on the self-regulatory skills that are necessary for managing LTPA participation among physically inactive (i.e., intenders) and currently active adults with SCI population (e.g., self-monitoring, goal-setting; Bandura, 1997, p. 415; Martin Ginis, Latimer, Arbour-Nicitopoulos, Bassett, Wolfe, & Hanna, 2011).

Taken together, the literature on LTPA within the SCI population indicates that adults with SCI are often confronted with personal, social and environmental barriers to LTPA participation. In order to address these barriers and increase LTPA behaviour, it is essential that LTPA-enhancing interventions identify and target theoretical constructs that are proven to be the most salient modifiable predictors of LTPA for the population. The following section will cover the most up-to-date research on predictors (both modifiable and non-modifiable) of LTPA behaviour in the SCI population.

1.2.3 Spinal cord injury-specific predictors of leisure-time physical activity

There are several demographic and social cognitive variables, which have been reported to influence LTPA participation within the SCI population. The primary demographic variables include age, sex, injury level, number of years post-injury, and mode of mobility (e.g., manual
or power wheelchair, walker; Martin Ginis et al., 2010). In terms of social cognitive variables, attitudes, subjective norms, perceived behavioural control, intentions, and perceived social integration, have been shown to be significant predictors of LTPA in the SCI population, together accounting for 19-25% of the variance in LTPA behaviour, with intentions exhibiting the strongest influence on LTPA behaviour (Martin Ginis et al., 2012). Given the concerns with the intention-behaviour gap within the behaviour change literature (Sutton, 2008), and that intentions only account for a small proportion (e.g. ~16%; Latimer & Martin Ginis, 2005; Martin Ginis et al., 2012) of the total variance in LTPA behaviour among individuals with SCI, further research has been directed towards examining the role of self-regulatory cognitions in translating intentions into action (e.g., Arbour-Nicitopoulos, Martin Ginis, & Latimer, 2009; Brawley et al., 2013; Latimer-Cheung et al., 2013; Latimer, Martin Ginis, & Arbour, 2006; Martin Ginis, Latimer, et al., 2011; Martin Ginis et al., 2013).

Many psychological theories have focused on self-regulation (e.g., self-determination theory; Deci & Ryan 1985; Deci & Ryan, 1991), with a large proportion of the foundational work dated back to Bandura’s Social Cognitive Theory (SCT) (Bandura, 1986). According to SCT, self-regulation is defined as a psychological process for maintaining both motivation and behaviour based on one’s: 1) personal standards and values; 2) self-monitoring performance level and outcomes; and 3) self-reaction to incentives and affect (Bandura, 1991). Self-regulation is comprised of cognitive (e.g., scheduling and barrier self-efficacy) and behavioural (e.g., goal-setting, action planning) components (Bandura, 1997; Bandura, 2004), both of which have been shown to strongly influence one’s ability to initiate and maintain LTPA behaviour (Schwarzer et al., 2008). LTPA preparation is especially relevant for individuals with SCI who have a considerable amount of commitments and needs related to their disability (e.g., daily self-care activities, rehabilitation, and transportation) (Martin Ginis et al., 2010; Martin Ginis et al., 2012). Previous research has shown that self-regulatory behaviours have a significant direct effect on LTPA behaviour (β =.72) within the SCI population, and that having the confidence to prepare for LTPA behaviour (e.g. self-regulatory efficacy) is an indirect determinant (β =.53) of LTPA through its mediating effect on outcome expectancies and self-regulatory behaviour (e.g., action planning) (Martin Ginis, Latimer, et al., 2011). Martin Ginis and colleagues (2011) reported that outcome expectancies are positively associated with task self-efficacy, an
additional social cognitive construct that supports LTPA behaviour through its indirect effect on self-regulatory behaviour. Thus, it is believed that these theoretical constructs can be useful targets within interventions aiming to alleviate the LTPA barriers most relevant to the SCI population (e.g., personal self-care and transportation).

In summary, the extensive theory-based research examining LTPA predictors within the SCI population supports the mediating role of self-regulation for translating LTPA intentions into behaviour, and therefore is considered to be an important construct to target in future interventions to promote LTPA participation within this population. The next chapter will follow-through with the current knowledge and theoretical underpinnings of self-regulatory training within LTPA-enhancing interventions for the SCI population. A large focus of these LTPA-enhancing interventions will be on the mediating role of groups and peer support to account for the previously mentioned SCI-specific barriers and predictors of LTPA (i.e., lack of motivation and social integration).

1.3 Review of leisure-time physical activity-enhancing interventions utilizing self-regulatory training and peer support

1.3.1 Theoretical framework for leisure-time physical activity-enhancing interventions

The current chapter will provide an overview of the key theoretical constructs supporting the development and maintenance of self-regulatory behaviour and the current LTPA-enhancing interventions tailored for the SCI population.

One theoretical framework that has a strong focus on the self-regulatory mechanisms underlying LTPA adoption and maintenance is the Health Action Process Approach model (HAPA; see Figures 1) (Lippke et al., 2004; Luszczynska & Schwarzer, 2003; Sniehotta et al., 2005; Ziegelmann et al., 2006). Within the HAPA framework, intention is the central construct that divides the model into a pre-intentional goal-setting (i.e. motivational) phase and a post-intentional goal pursuit (i.e., volitional) phase (see Figure 1; Schwarzer, 2008; Schwarzer, 2010). The motivational phase consists of three social cognitive constructs: risk perceptions,
outcome expectancies, and task self-efficacy (Schwarzer et al. 2008). Risk perceptions are distal predictors that contribute to the contemplation process of change involving thoughts regarding consequences and for a specific behaviour or lack thereof (Schwarzer et al. 2008). The latter two constructs in this phase are considered proximal antecedents to developing behavioural intentions (Schwarzer et al. 2008). Outcome expectancies are a result of comparing the advantages and disadvantages of engaging in a particular behaviour, while task self-efficacy focuses on one’s confidence to perform the target behaviour adequately (Schwarzer et al. 2008). Meanwhile, the volitional phase of HAPA consists of the self-regulatory mediating variables, which support the translation of intentions into action (termed the intention-behaviour gap; Sutton, 2008; Schwarzer et al. 2008). Developing an action plan with situational parameters detailing when, where, and how to engage in the behaviour, and supplementing this plan with strategies for coping with setbacks (e.g. coping plans) elicits two proximal constructs to strengthen one’s intention for engaging in the target behaviour (Schwarzer et al. 2008). There are also several self-regulatory efficacy constructs, which support an individual’s ability to translate these action and coping plans into action within the volitional phase, which include maintenance (coping) self-efficacy and recovery self-efficacy (Schwarzer et al. 2008). Prior to action, the individual develops the confidence to manage task-related barriers (coping self-efficacy), and the motivation to regain control over behaviour following a relapse (recovery self-efficacy) (Schwarzer et al. 2008). These self-efficacy constructs provide the self-regulatory skills necessary to maintain the desired behaviour upon successful initiation. Additionally, it is imperative for the individual to understand that unforeseen, external challenges may impede behaviour maintenance. Action control, referring to the act of simultaneously evaluating behaviour against a standard, as well as the implementation of a contingency plan are helpful resources for possible future relapse(s) to enhance confidence in regaining control and resuming the behaviour of interest (recovery self-efficacy) (cf. Schwarzer et al., 2008).

Within these two HAPA phases, there are stage-specific ‘mindsets’ which exemplify an individual’s readiness to initiate the target behaviour: the non-intender, intender, and actor (Schwarzer, 2008a; 2008b). With respect to LTPA, a non-intender mindset is when an individual is not actively engaged in a regular LTPA routine and does not have any interest in initiating LTPA in the future (Schwarzer, 2008a). An intender mindset is portrayed when an
individual is not actively engaged in a regular LTPA routine but plans on initiating LTPA in the future (e.g., within the next 6 months) (Schwarzer, 2008a). Meanwhile, an actor mindset is exemplified when an individual who has been regularly participating in LTPA for any given length of time (Schwarzer, 2008a), and has made plans in the future to continue with this behaviour. An underlying assumption of the HAPA framework is that when the individual progresses from a non-intender to actor mindset, the respective social cognitive constructs within each stage of the HAPA model strengthen (Schwarzer, 2008). This assumption has been supported in previous SCI research where significant group differences were exhibited for the HAPA constructs, with individuals of an actor mindset reporting the greatest use of self-regulatory behaviours and strongest self-efficacy for maintaining regular LTPA than either the intender or non-intender mindset groups (Martin Ginis et al., 2013).
Figure 1. Diagram of the Health Action Process Approach (HAPA; cf., Schwarzer, 2008b) divided into the goal-setting (motivation) phase and the goal pursuit (volitional) phase.
1.3.2 Self-regulatory leisure-time physical activity interventions in the spinal cord injury population

The self-efficacy and planning constructs collectively manage behaviour maintenance and recovery following a relapse. Self-regulatory efficacy for scheduling and planning LTPA as well as action and coping planning behaviours have been shown to positively influence the self-management of LTPA in many clinical populations such as SCI, postnatal women, and obese adolescents (e.g., Arbour-Nicitopoulos et al., 2009; Brawley et al., 2013; Cramp & Brawley, 2009; Wilson et al., 2012). For example, a randomized controlled trial was conducted among a sample of 44 intenders with SCI to investigate the effects of supplementing action plans with coping plans on LTPA behaviour and coping self-efficacy (e.g., having the confidence to schedule LTPA and overcoming barriers to LTPA) (Arbour-Nicitopoulos et al., 2009). In the action planning only condition, participants were asked to form detailed plans outlining when, where, how long, and at what intensity they intended on engaging in LTPA. In the combined action and coping planning condition, participants developed action plans as well as coping strategies for solving up to three self-identified potential LTPA barriers. Findings from this 10-week intervention support the use of action and coping planning strategies for the SCI population given that LTPA behaviour was significantly greater in the combined action and coping planning condition in comparison to the action planning only condition. Further regression analyses indicated that the intervention accounted for 38% of the variance in LTPA behaviour, with scheduling self-regulatory efficacy partially mediating this effect ($\alpha = .31, p < .03$) (Arbour-Nicitopoulos et al., 2009). Based on these findings, the authors recommended that further research is needed to understand the key intervention strategies for teaching community-dwelling adults with SCI how to acquire action and coping planning skills.

A follow-up pilot feasibility intervention (known as RAMP-Up) was conducted to address this need for teaching community-dwelling adults with SCI the key self-regulatory skills (e.g., action and coping planning) to self-manage their own LTPA behaviour outside of a structured, supervised exercise program (Brawley et al., 2013). Within this feasibility intervention, a technique called group-mediated cognitive behavioural (GMCB) counselling was used based on the expectation that a group-based format for delivering counselling treatment can act as an
agent of change (Cartwright, 1972), and consequently, facilitate long-term adherence to self-regulatory strategies and behaviour (cf. Meichenbaum & Turk, 1987). The main research objective of this intervention was to pilot the feasibility, usability and participant acceptability of using the GMCB approach, in a face-to-face setting, to teach a sample of 10 actors with SCI how to increase and maintain self-managed LTPA outside of a structured, supervised exercise program. The intervention consisted of a 7-week ‘intensive’ phase that involved the formation of detailed action and coping plans for adding an extra day of moderate-to-heavy LTPA outside of a structured, supervised exercise program. The last two weeks of the ‘intensive’ phase of the intervention were devoted to designing and evaluating progress for a personal 2-week LTPA action plan. Once the participants had the opportunity to translate their action plans into behaviour and receive feedback from the group on progress during the final session, the participants were fully prepared to conclude the program by developing a 3-week action and coping plan to be implemented during a subsequent 2-week ‘Transition’ period. Post-intervention (week 10) results demonstrated that the GMCB counselling intervention had a moderate-to-large effect on action planning \(d=0.77\), and self-managed moderate-to-heavy LTPA \(d=0.83\), as well as a small-to-moderate effect on scheduling self-regulatory efficacy \(d=0.31\) (Brawley et al., 2013). These positive findings from the RAMP-Up intervention have substantially advanced knowledge on effective intervention techniques for delivering face-to-face group-based self-regulatory training to the SCI population. However, given the focus on actors with SCI, and the face-to-face nature of this intervention, and consequently the concerns surrounding transportation barriers for implementing such a group-based intervention to the larger SCI population, further research is required to examine the generalizability of these findings to individuals exhibiting other mindsets (e.g., intenders) as well as more accessible delivery format of the group intervention (e.g., online).

In addition to the GMCB technique, there has been research conducted utilizing an individualized counselling technique called motivational interviewing (MI) for facilitating LTPA within the SCI population (Latimer-Cheung et al., 2013). In comparison to the increase in self-regulatory skills that were reported in the earlier GMCB intervention among actors with SCI (Brawley et al., 2013), Latimer-Cheung and colleagues (2013) demonstrated that a single, one-on-one MI session yielded positive self-regulatory cognitions in a sample of seven LTPA
intenders with a SCI for action planning (small-to-medium effect \([d=0.42]\)), but a reduction in scheduling self-efficacy (small non-significant reduction \([d=-0.23]\)). Given the differences in intervention dose (i.e., a single session vs. 10-weeks), LTPA status (intenders only vs. actors only), and the inclusion of a 2-week ‘Transition’ period only in the GMCB intervention, further research is warranted to determine whether the MI approach can also produce stronger, long-term effects for self-regulatory cognitions and behaviour with multiple sessions. However, it is important to note that the differences in objectives of these two counselling techniques. The primary aim of the GMCB counselling is to educate and build skills (i.e., LTPA self-regulation) (Brawley et al., 2014; Beck, 2011), while MI counselling uses a person-centered approach with briefer sessions to evoke the self-evaluation of thoughts and emotions (i.e., ambivalence), while simultaneously building intrinsic motivation to change behaviour (Miller & Rollnick, 2002). Consequently, the structure and principles of MI counselling may only provide an indirect focus on informational support; whereas, interventions, such as GMCB that are primarily aimed at increasing knowledge and application of skills by utilizing group members as an agent of change (Brawley et al., 2014). Given that the individual-based approach to cognitive behavioural intervention have been shown to feasibly and effectively deliver its education-focused principles in a group-based format (Lundahl et al., 2010), it is worthy to note that the social influence and group identity elicited in group-based counselling can evoke similar feelings of empathy and client engagement, primarily emphasized in MI techniques (Beck, 2011). Furthermore, it is speculated that the incorporation of the person-centered approach (i.e, MI) with the educational aspect of GMCB interventions can support the needs of those in the initial stages of changing behaviour (i.e., LTPA intenders) and require additional support during the motivational phase of overcoming barriers related to low self-efficacy and ambivalence (i.e. task self-efficacy; Schwarzer et al. 2008). Therefore, the group-based environment of the GMCB approach provides a useful, economical and safe opportunity to share personal experiences and learn the appropriate skills and strategies to manage unhealthy behaviours (Brawley et al., 2014) among a diverse set of individuals (i.e., LTPA intenders and actors).
1.3.3 Using group-mediated cognitive behavioural interventions in the context of leisure-time physical activity promotion

The GMCB approach to self-management counselling has been effectively implemented within a diverse group of individuals, including obese adolescents (Wilson et al., 2012), postnatal women (Cramp & Brawley, 2009), older adults with a risk of cardiovascular disease (Rejeski et al., 2003), and most notably, actors with SCI (Brawley et al., 2013). Typically, GMCB interventions to promote LTPA are two to three months in duration, and are most often delivered in a face-to-face group environment, followed by a 3-week home-based self-management phase (Brawley et al., 2014, p. 189). The study designs of GMCB interventions have most often used either a within-subjects, treatment only condition or a comparison between GMCB and standard exercise conditions. The three primary intervention outcomes examined in the LTPA promotion research utilizing the GMCB approach to increase self-regulatory behaviour include LTPA adherence and social cognitions (Brawley et al., 2014). Table 1 provides an outline of the current LTPA-enhancing research utilizing the GMCB approach in a diverse selection of populations and the corresponding intervention findings.

As shown in Table 1, the GMCB interventions involving between-group and within-treatment methodologies have demonstrated positive results for participant adherence to self-managed LTPA behaviour, ranging from moderate to very large-sized effects (Brawley et al., 2000; Brawley et al., 2012; Brawley et al., 2013; Brawley et al., 2014; Cramp & Brawley, 2006; Cramp & Brawley, 2009; Focht et al., 2005; Rejeski et al., 2003; Sarkisian et al., 2007; Wilson et al., 2012). These effect sizes have been attributed to the group dynamics of the GMCB intervention as well as the value of tailoring the intervention to the needs of the target population (Brawley et al., 2014). For instance, Brawley and colleagues (2013) conducted interviews with prospective study participants prior to gain a clear understanding of actors with SCI’s current lifestyle and barriers to independent LTPA (Brawley et al., 2013). This background information informed the GMCB interventionist on potentially relevant intervention content and ensured that participants’ motivation and collaboration were sustained throughout the 10-week GMCB intervention (Brawley et al., 2013).
In addition to the changes in self-managed LTPA behaviour, several GMCB interventions have shown positive results for social cognitions with moderate to very large-sized effects \((ds = 0.31-1.40)\) (Brawley et al., 2014). These social cognitions have consisted of task and self-regulatory (scheduling and planning) self-efficacy (Cramp & Brawley, 2009; Focht et al., 2005), outcome expectancies (Cramp & Brawley, 2009), and satisfaction with physical functioning (Brawley et al., 2012). Interestingly, Cramp and colleagues (2009) demonstrated significant partial mediation for self-regulatory efficacy in the context of home-based LTPA. Taken together, these results indicate that the GMCB approach promotes positive changes in self-regulatory efficacy such as scheduling and planning, which consequently influence the maintenance of self-managed LTPA.

The main findings for the GMCB interventions highlighted in Table 1 demonstrate the feasibility of delivering face-to-face, group-based interventions to enhance self-managed LTPA, and several self-regulatory processes (e.g., outcome expectancies, action planning, and self-regulatory efficacy). Currently, the research has shown positive results for adherence rate in the GMCB interventions (e.g., 88% adherence rate for total intervention duration; Brawley et al., 2013). These positive results have been reported within a wide range of clinical populations in both feasibility and randomized controlled trials.
Table 1.

**Summary of Studies Using the Group-Mediated Cognitive Behavioural Intervention Approach for Promoting Self-Managed Leisure-Time Physical Activity**

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Brief GMCB protocol</th>
<th>Measures</th>
<th>Results</th>
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| Brawley et al., 2013| 13 active adults with SCI from a supervised exercise program (2-3 days/week); 5 males; $M_{age}=57.00$ years ($SD=9.36$); 50% tetraplegia; 70% incomplete SCI | Treatment-only study design                               | Baseline and post- intervention • SRE (scheduling and planning)           | • Increased self-managed MVPA (minutes/week): $t=3.05^*; d=0.83^a$
|                     |                                                                              | 1. Baseline assessment                                    | • Action plan agreement                                                  | • Increased scheduling SRE: $t=0.62; d=0.31$
|                     |                                                                              | 2. 7-week intensive phase                                 | • LTPA                                                                   | • Increased action planning: $t=2.12^b; d=0.77^b$
|                     |                                                                              | 3. 3-week transition phase                               | • Likelihood of physically meaningful outcomes                           | • Increased physical outcome likelihood: $t=2.40^*; d=0.73^a$
| Wilson et al., 2012 | 43 obese adolescents; 13 males; BMI > 95th percentile; 10–16 years old       | Randomized feasibility study design; Weekly group sessions (20-38 min) | • SRE                                                                    | • A significant main effect for time for LTPA volume (increase; $F(2, 36) = 15.51, p < .001, \eta^2 = .46$)
|                     |                                                                              |                                                          | • OE                                                                     | • A significant main effect for time for LTPA volume (increase; $F(2, 36) = 15.51, p < .001, \eta^2 = .46$) |
|                     |                                                                              |                                                          | • Self-managed LTPA                                                     | • A significant main effect for time for LTPA volume (increase; $F(2, 36) = 15.51, p < .001, \eta^2 = .46$) |

*Note: $t$-tests were one-tailed for directional hypotheses.*
<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Intervention Details</th>
<th>Pre- and post- centre-based training</th>
<th>Post- centre based training as well as home-based training</th>
<th>Follow-up changes</th>
</tr>
</thead>
</table>
| Cramp & Brawley, 2009 | 57 postnatal women (SE: N = 31; GMCB: N = 26) | 2 intervention conditions: GMCB plus exercise or SE only; 4-week supervised, centre-based intensive exercise training followed by 4-week home-based training; 6 GMCB sessions (20 minute duration) following each centre-based training session | • SRE  
• OE  
Post- centre based training as well as home-based training:  
• Self-managed LTPA | GMCB condition: SRE and OE maintained;  
SE condition: SRE and OE declined;  
High ratings: Group cohesion: $M=2.96$ ($SD=0.29$); Collaboration: $M=3.19$ ($SD=0.36$) |  

Rejeski et al., 2003 | 147 older men and women (GMCB: $M_{age}$ =64.73 yrs, SD=7.18; SE: | 2 treatment groups: GMCB vs SE; 12 month trial; GMCB protocol: Months 1-2: Two  
• Task self-efficacy  
• Barrier self-efficacy  
• Self-reported LTPA | | Follow-up changes: GMCB > SE  
Increased LTPA (square root), $M = 2.09$ hours/week, SE=0.10, effect size = 0.36; increased task self-efficacy, $M = 66.70$, |
M_{age} = 64.87 yrs, SD = 6.76, respectively) at risk or diagnosed with CV disease (75% heart disease) 20-25 min sessions/week; Month 3: One 20-25 minute session/week; Months 4, 6, 9: 30 min booster session/month

SE = 1.90, effect size = 0.41;

- Barrier SE associated with LTPA (r = .36, p = .04)

SCI = spinal cord injury; MVPA = moderate-to-vigorous physical activity; LTPA = leisure-time physical activity; SRE = self-regulatory efficacy; OE = outcome expectancies; GMCB = group-mediated cognitive behavioural intervention; SE = standard exercise; CV = cardiovascular.

* Cohen’s d effect sizes interpreted as small (d = 0.20), medium (d = 0.50), and large (d = 0.80); \(^{b}p < .10; ^{c}0 to 4 scale.\)

* p < .05.
In summary, the findings from previous GMCB-related literature have supported the group-based format as a feasible intervention strategy for delivering face-to-face LTPA self-regulatory training within the SCI population. However, there still remains a large portion of the SCI population who cannot take advantage of this group-based format of LTPA interventions and programs due to transportation access barriers (e.g., ~20% of persons with SCI living in rural communities in Canada). Therefore, further research is needed to examine how to reach out to these individuals with limited access to group-based community programs (i.e., Internet-based intervention delivery).

Based on the evidence showing positive outcomes from self-regulatory training among a group of peers, the following section will provide an overview of peer-to-peer socialization, the theoretical background of peer support, as well as a review of the current literature related to peer-based promotion of LTPA behaviour in the SCI population.

1.3.4 Literature review of peer support in a health care context

Peer support has the potential to meet the task and social needs of self-regulatory training programs. These programs can benefit from the inclusion of peers who possess similar characteristics, but who can also contribute their unique skills and knowledge in order to encourage vicarious learning and self-regulatory training education (i.e., learning of coping skills) (Dennis, 2003). Using previous literature to inform the conceptualization of peer support in a health care context, Dennis (2003) defined peer support as, “the provision of emotional, appraisal, and informational assistance by a created social network of members who possess experiential knowledge of a specific behaviour or stressor and similar characteristics as the target population…” (p. 329). As such, peer support may play a significant role in promoting LTPA participation and ultimately community reintegration following hospitalization or rehabilitation in the SCI population.

Peers are one of the most preferred sought out messengers for general health and LTPA-related information within the SCI population (Faulkner et al., 2010; Letts et al., 2011). The experiential knowledge that peers can provide is invaluable during the adjustment process while
reintegrating back into the community after acquiring an SCI (Boschen, 2003). This experiential knowledge is believed to contribute to the credibility of information received, compared to messengers who have not directly experienced the adjustment process (Borkman, 1976; Faulkner et al., 2010; Letts et al., 2011). In addition to gaining informational support, there is also the additive effect of emotional support when interacting with individuals who are relatable and equal in hierarchy status (Borkman, 1976; Dennis, 2003), and who can contribute meaningfully with encouraging feedback and inspirational stories about independent living (Perrier et al., 2013). However, this aspect of peer support is reported to be poorly met in SCI rehabilitation and community-based services (i.e., self-management of long-term conditions) due to the challenge of providing accessible, tailored and empathetic care (Goodridge et al., 2015; Martin Ginis et al., 2015). The importance of increasing access to peer support is crucial for the SCI population, as research has shown that peer support need fulfillment is positively associated with participation in specific types of autonomous outdoor activities, such as maintaining physical health (Sweet et al., 2015).

Physical activities and, most notably, sport participation has been shown to be one avenue for receiving informational, emotional and coping support from fellow peers with a SCI (Faulkner et al., 2010; Goodridge et al., 2015; Zemper et al., 2003). Furthermore, Goodridge and colleagues (2015) indicated that gaining sport-related advice from a peer athlete can facilitate continued participation in sports, as well as act as a form of psychological counselling (Faulkner et al., 2010; Goodridge et al., 2015). This is especially relevant for those individuals with SCI who may have limited access or availability to medical care, such as those residing in rural environments (Goodridge et al., 2015). Taken together, the evidence shows that peer support can play a role in enhancing physical and psychological health within the SCI population.

In support of the need to accommodate injury-specific barriers to LTPA, it is recommended that the provision of LTPA resources, such as peer support, should be tailored to the target demographic group (i.e., age, gender, injury level) (Faulkner et al., 2010; Martin Ginis 2015). For a good mentor-mentee relationship to develop and to enhance LTPA promotion, peer support programs should consider matching mentors and mentees according to injury
characteristics, such as primary use of mobility aid (Haas, Price & Freeman, 2013; Martin Ginis et al., 2015). In addition to demographic characteristics, it is recommended that peer mentors possess similar interests, as well as certain personality traits (i.e., good sense of humour and sociability), and have the ability to tailor peer interactions according to individual learning styles (Haas, Price & Freeman, 2013). Thus, peers who are matched according to injury characteristics, functional capacity, and social needs can be an appropriate method for delivering relevant and practical advice and encouragement. The expectation is that the provision of relatable and engaging peers in LTPA-enhancing interventions can stimulate perceived behavioural control among mentees in the targeted health behaviour (Martin Ginis et al., 2015).

1.3.5 Theoretical underpinning for leisure-time physical activity peer support interventions

The literature presented, thus far, has introduced the use of Social Cognitive Theory (SCT) and the Health Action Process Approach (HAPA) to inform the key self-regulatory constructs supporting LTPA-enhancing interventions within the SCI population. Within the peer support and LTPA literature, SCT has been suggested as a useful theory to focus on in LTPA-enhancing interventions to develop peer interactions (Martin Ginis et al., 2013). Human behaviour is conceptualized within SCT as a dynamic social learning process involving the self-regulation of personal goals through constant self-monitoring, self-evaluation, reinforcement and modification of behaviour (Bandura, 1997; Bandura, 2004). Self-efficacy, defined as the belief in one’s ability to accomplish a certain task successfully, is the central, influential construct for this self-regulatory process (Bandura, 1997; Bandura, 2004). The interrelationship within SCT between personal, behavioural and environmental factors has an influential effect on the development of self-efficacy and behaviour change (Bandura, 1997; Bandura, 2004). The reciprocal nature of these three factors has been shown to have a strong effect on self-efficacy through four strategies: 1) mastery experience; 2) vicarious learning; 3) verbal persuasion; and 4) physiological and emotional state (Bandura, 1997). Martin Ginis and colleagues (2013) suggest that these strategies effectively enable motivational processes within peer-to-peer interactions.
The four strategies established by SCT as having a strong impact on self-efficacy have informed group dynamics theory, the theoretical basis for the GMCB intervention approaches (Brawley et al., 2014). For example, the social environmental context within the GMCB intervention (i.e., peer-to-peer socialization) is believed to enhance group development and furthermore, create positive changes in cognitions, and physiological, emotional, and behavioural responses (Beck, 2011; Brawley et al., 2014). Vicarious learning and verbal persuasion are the key constructs that impact the four important processes for positive group dynamics (Brawley et al., 2014; Cartwright, 2008) which include: 1) the formation of a common group motivating goal for the basis of all group discussions; 2) increased group cohesion through active listening and productive feedback; 3) acceptance of group norms by all members; and 4) commitment to continued practice of learned self-regulatory skills outside of the group (Brawley et al., 2014). The development of self-regulatory behavioural skills and self-efficacy through these four processes is expected to have an influence on self-efficacy and, consequently, manage key self-regulatory cognitions and affect for behavioural maintenance (Brawley et al., 2014). The initiation of group interaction centered on a common goal becomes a group norm and facilitates group cohesion, identity, and distinction (Brawley et al., 2014). Therefore, the group is considered both an agent and target of change (Brawley et al., 2014).

The social environmental context of SCT strongly supports the utilization of peer support within the ‘Intensive’ and ‘Transition’ phases of the GMCB intervention approach (Brawley et al., 2012; Brawley 2013; Cramp 2006, Cramp 2009; Focht et al., 2005; Rejeski 2000;). During the ‘Intensive’ phase, the group engages in interactive discussions with a supplementary activity book focused on guiding discussions towards the formation of a toolbox containing valuable self-regulatory tools (e.g., self-monitoring, goal-setting, planning, relapse prevention, and problem solving strategies) (Brawley et al., 2014). During group sessions, participants learn to observe and model their peers’ attitudes and behaviours (vicarious experience), and gain valuable feedback from peers and the group facilitator (Brawley et al., 2014). Between group sessions, participants are held accountable to apply their learned skills and contribute to weekly group goals by self-monitoring cognitions and behaviours through home-based activities, as well as through ‘buddy interactions’ for continued peer feedback on problem solving (Brawley
et al., 2014). Through the practice and mastery of these self-regulatory skills (i.e., mastery experience), participants begin to acquire positive attitudes (outcome expectancies) and confidence (self-efficacy) to perform and adhere to healthy behaviours, independently (Brawley et al., 2014). The peer-based focus of the ‘Intensive’ phase of GMCB interventions is expected to promote a similar group-oriented approach as LTPA rehabilitation services by meeting the particular needs of a clinical group that is heavily reliant on the supervision from a qualified professional (e.g. persons with SCI who have pain-related activity restriction). This approach facilitates participant interest, cooperation, and relatedness to the intervention content and adherence to learning self-regulatory skills (Brawley et al., 2014). Meanwhile, during the second ‘Transition’ phase of GMCB interventions, participants graduate from the group and are expected to continue using their self-regulatory tools gained from the GMCB intervention to assist in maintaining their behaviour independently, with minimal supervision and/or follow-up consultation (e.g. booster sessions) with the facilitator (Brawley et al., 2014).

Taken together, SCT and group dynamics theory support the influential role of peer support for facilitating self-regulatory training. The following section will describe the current state of LTPA-enhancing interventions utilizing the key SCT constructs to inform the unique contribution of peer-based support in comparison to professional led interventions for enhancing physical and psychological health in the SCI population.

1.3.6 Literature review comparing peer support with professionally-led peer support

To assess the unique contributions of peer-based support, a focus group was followed up after conducting a scoping review of messengers of LTPA-related information to explore the perceptions and experiences of persons with SCI on the use of a wide range of messengers (Letts et al., 2011). Peers were identified by study participants as the most common messenger of LTPA-related information because of their perceived credibility and realistic nature of the information that they are able to provide (Faulkner et al., 2010; Letts et al., 2011). Many individuals also reported aspects of peer support that aligned with constructs of SCT. For example, participants emphasized the value of listening and observing the experiences and
successes of peers who have pursued a physically active lifestyle. Theoretically, this implies that gaining this kind of health information and peer support can enhance recipients’ self-efficacy in pursuing physical activities and, overall, promote community reintegration (Ljungberg et al., 2011; Shem et al., 2011; Veith et al., 2006). Therefore, it is suggested that peer-based interventions should target key motivational constructs linked to SCT, such as vicarious learning and verbal persuasion (Bandura, 1997) in order to effectively impact the initiation and maintenance of LTPA participation. The delivery of theoretically-sound interventions to manipulate the social environment has been shown to facilitate psychological adjustment and longer life expectancy (Cohen, 2000). Indeed, an accumulation of peer support has shown the positive effects of using peers in interventions for enhancing physical, psychological and social health outcomes (Dennis, 2003). Dennis (2003) conceptualized the implementation of peer support in the social environment on a continuum, according to the extent of preparation or training and the type of created peer support (group or one-on-one): 1) self-help (limited professional training); and 2) professionally trained peer support.

In the context of LTPA-enhancing interventions, the provision of informal self-help groups comprised of peers of equal status without peer training experience is relatively sparse in SCI research. On the other hand, trained peer mentors have commonly been utilized to provide informational (i.e., self-regulation) and appraisal (i.e., feedback and encouragement) support, as a means for increasing psychological well-being (i.e., self-efficacy, intrinsic motivation and perceived competence) (Martin Ginis et al., 2013). In a systematic review of peer-delivered LTPA interventions, Martin Ginis and colleagues (2013) determined that individuals who interact with peer mentors can increase their LTPA behaviour as effectively as being educated through a health care professional. In addition, the literature evaluated showed that the peer mentorship experimental groups produced significantly greater LTPA outcomes than attention-control (Castro, 2011) and normal intervention control (Parent, 2000) groups, indicating that the effectiveness of peer mentorship is specifically attributed to the focus on experiential LTPA knowledge and promotion.
Peer mentorship has also been offered in the mentee’s home environment. The benefit of home visits is that it can overcome time and space barriers commonly experienced by persons with SCI who are seeking peer support services. The first reported brief LTPA-enhancing intervention delivered in a home environment in any population was conducted within a sample of 12 intenders with paraplegia (Latimer-Cheung et al., 2013). A single home visit was made to each participant, with the session focused on designing and practising a home-based strength-training routine. The role of the peer was to demonstrate the exercises prior to the participant practising their individual-based strength-training routine. Overall, Latimer-Cheung and colleagues (2013) reported that 7 out of the 12 participants completed an end-of-visit survey and reported positive perceptions regarding the impact of the single peer-based session on their confidence levels and knowledge regarding self-managed application of the exercises demonstrated by the peer ($M > 6.60$ out of 7). Furthermore, participants believed that the home visit with the peer provided relatedness, convenience and helpfulness in achieving their strength-training goal ($M > 6.49$ out of 7), and all participants were satisfied ($M = 6.50 \pm 0.54$ out of 7) with their prescribed exercises; including a 1-week action plan designed at the end of the home visit (Latimer-Cheung et al., 2013). Based on these preliminary findings, peer mentors appear to be very useful for providing informational and emotional support while promoting LTPA behaviour change (Latimer-Cheung et al., 2013). Future research is recommended to determine the receptivity and feasibility of delivering peer support in a home environment that does not require excessive resources for the mentor (i.e., travelling).

### 1.3.7 Future research considerations on peer support for the promotion of leisure-time physical activity in the spinal cord injury population

Given the positive outcomes associated with peer support and LTPA promotion, further research is required to determine the best strategies for reaching out to a large proportion of the SCI population and increasing access to peer support. The provision of peer support to particular subgroups of a population who struggle to gain access to tailored community-based LTPA programs (i.e., rural communities) can potentially be enhanced through informal self-help peer support groups. The experiential knowledge fostered in this kind of peer support setting is based on a gathering of “persons who share a common problem and who band together to resolve the
problem through their mutual efforts” (Borkman, 1976). Additionally, informal self-help groups offer the opportunity for peers to gain multiple perspectives on a certain topic, as supported by previous opinions expressed by peer mentees (O’Riley, 2014). The evidence supporting GMCB interventions can help foster this approach to peer support. Moreover, it is speculated that informal self-help groups may promote learning and positive social interactions without the additional training and interventionist monitoring resources that are necessary to ensure implementation fidelity in peer interventions delivered by a peer mentor or health care professional (Martin Ginis, Nigg, & Smith, 2013). However, transportation still remains a large barrier to accessing this tailored peer support network. New and innovative methods are necessary for increasing population reach and access to such networks. Within the SCI literature, individuals report a high preference for receiving peer support and health-related information via the Internet (Faulkner et al., 2010; Letts et al., 2011). It can also further enhance the cost-effectiveness of peer-delivered home visits. Based on this knowledge, a peer support program delivered via the Internet holds promise for the SCI population, especially via videoconference when interaction is supported via video and audio input.

Taken together, a feasibility study on the effects of a more accessible, Internet-based delivery of the GMCB intervention to promote self-managed LTPA and self-regulatory cognitions and behaviour holds promise for addressing the accessibility and socialization needs within the SCI population. Furthermore, the greater accessibility to peer support via Internet-based communication platforms (ICPs) may encourage individuals with SCI to reintegrate back into the community earlier in the rehabilitation process; thereby instilling greater social integration. Currently, there is limited evidence for the efficacy of an Internet-based delivery of the GMCB intervention in the SCI population.

In the next chapter, an overview of the current literature regarding Internet-based communication platforms (ICPs) in the SCI population will be provided as a means for proposing ICPs to deliver peer support. Based on the lack of research available for the SCI population, a specific focus will be on the provision of online informal self-help groups.
1.4 Internet-based communication platforms

With the increasing use of Internet-based communication platforms (ICPs; e.g., email, instant messaging, videoconferencing) across a range of sociodemographic variables (Correa et al., 2010), it is perhaps of no surprise of the increasing interest among behaviour change researchers to use ICPs as a mode of delivery to evaluate the real-world applicability of accessible group-based peer support programs. There are numerous strengths and limitations for the delivery of peer support via ICPs, particularly within videoconference platforms, such as Skype® (see Table 2). For the purpose of this thesis, a critique of the use of specifically videoconference platforms will be discussed.

1.4.1 Special considerations for using videoconferencing for self-management peer support

Amidst the debate of whether ICPs can effectively deliver self-management peer support (Sarhan, 2009), there is evidence to support that the benefits far outweigh the challenges of using videoconferencing (see Table 2 for an overview of the strengths and limitations). As opposed to asynchronous communication such as email, chat rooms, and instant messaging, videoconferencing provides real-time (i.e., synchronous) communication via audio-visual transmission, whereby peers and group facilitators can maintain a strong collaborative relationship by conveying meaning through speech, body language, and paralinguistic channels (e.g., voice pitch, volume, and intonation) (Abbass et al, 2011). The delivery of peer support via videoconference can be especially useful for individuals who experience face-to-face social anxiety or simply prefer distant communication (Woo et al., 2011; Yuen et al., 2013). However, there are some cases where individuals view the use of videoconferencing as a detriment to the collaborative relationship between the peers and group facilitator as a result of reduced interpersonal connection. Table 2 provides examples of solutions for enhancing the audio and video quality, and maintaining privacy and interpersonal connection in a videoconference platform (Shore, 2013). Ultimately, the success of a videoconference-delivered peer support group depends on efforts on the part of both the group facilitator and peers to maintain a safe
and trustworthy environment for discussion and promotion of group identity and cohesion (Beck, 2011; Brawley et al., 2014; Laitinen et al., 2010; Shore, 2013).

Through the use of videoconferencing, interventionists can potentially reach a larger and more diverse proportion of peers of a specific population (e.g., SCI) on a wider geographical scale (Mcgee & Tangalos, 1994). Videoconferencing can also provide convenient, accessible, and affordable opportunities to learn self-management skills and strategies in the comfort of one’s own home (Phillips et al., 2001). Taken together, the use of an accessible and interactive videoconference platform can help informal self-help peer groups thrive and furthermore, facilitate self-management support. With these benefits for using a videoconferencing platform considered, the following section will outline the current literature describing individual-level motives for joining virtual groups and the resulting outcomes for group members.
### Table 2.

**Advantages and Disadvantages of Videoconference As A Medium for Peer-Based Self-Management Support**

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages (plus solution/management)</strong></th>
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<tbody>
<tr>
<td>Self-management tool; promote community reintegration (Phillips et al., 2001)</td>
<td>Visual and audio clarity (Careau et al., 2008; Kairy et al., 2009; Sarhan, 2009)</td>
</tr>
<tr>
<td></td>
<td>Solution: demonstrate and practice navigating through the videoconference platform with participants (Shore, 2013); create cue cards to signify to the group on any technical issues (Laitinen et al., 2010)</td>
</tr>
<tr>
<td>Clinical outcome equivalent with face-to-face therapy (King et al., 2014; Nield &amp; Soo Hoo, 2012)</td>
<td>Privacy and confidentiality risks (Sarhan, 2009)</td>
</tr>
<tr>
<td></td>
<td>Solution: informed consent; voluntary disclosure of personal information; choice of a videoconference platform (e.g., Skype®) that encrypts visual and audio content to prevent interception from malicious users (Choi et al., 2014; Hayes, 2014; “ISO consensus paper: Skype,” 2008)</td>
</tr>
<tr>
<td>Eliminate transportation barriers; greater access to specialty health care (distant supervision; Galea et al., 2006; Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011)</td>
<td>Poor therapeutic alliance (e.g. reduced affective experience; reduced personal connection and empathy) (Shore, 2013)</td>
</tr>
<tr>
<td></td>
<td>Solution: build group identity and cohesion to develop trust and openness (Beck, 2011; Brawley et al., 2014)</td>
</tr>
<tr>
<td>Consistent monitoring and feedback resulting in sustained SCI recovery and medical cost-effectiveness (e.g. hospitalization duration, ambulance services; Matthewson et al., 2000; Phillips et al., 2001)</td>
<td></td>
</tr>
<tr>
<td>Reduce out-patient program wait-lists (Ekeland, Bowes &amp; Flottorp, 2010)</td>
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Enhanced physical presence with verbal and visual inputs (i.e., close replication of face-to-face interaction; Martins, Gilson & Maynard, 2004; Taylor, 2012)

Reduced social anxiety (Woo et al., 2011; Yuen et al., 2013)
1.4.2 Peer support in a virtual group setting: motives and consequences

Several key motives have been identified for participation in virtual groups via various ICPs. McKenna & Green (2002) suggest four reasons why individuals join a virtual group, which include: 1) having the ability to express one’s ‘ideal self’ in a non-judgmental environment (i.e., alleviate social anxiety); 2) the ability to meet individual time demands; 3) having the ability to bond with a group of like-minded individuals with similar experiences; and 4) reducing feelings of loneliness. Consequently, McKenna & Green (2002) determined that it is these four key attributes of virtual communities that develop group identity (Brawley et al., 2014) at a faster rate and instil group collaboration as effectively as face-to-face social interactions.

Additional virtual group research, specifically within the health care context, has proposed that successful virtual groups that successfully develop group identity and collaboration must have a common purpose, goal, and individual role(s) or identities for each group member (Demiris, 2006). For example, within informal self-help peer support networks, status hierarchies do not exist and all members share commonalities to support the attainment of the group goal (AmiChai-Hamburger et al., 2008; Demiris, 2006). These attributes of virtual groups are highly valued among stigmatized and underserved populations because of the opportunity to interact with like-minded others in a safe and non-threatening environment, where hidden identities can be socially validated and encouraged (AmiChai-Hamburger et al., 2008). AmiChai-Hamburger and colleagues (2008) suggest that these motivating factors empowers group members to accept normative behaviours, collaborate (i.e., brainstorm) and bond with the group (AmiChai-Hamburger et al., 2008). The expectation is that through these virtual interactions, group members will improve their self-concept, sense of social inclusion, and eventually participate in ‘real’ non-Internet social interactions (AmiChai-Hamburger et al., 2008). Overall, ICPs are perceived as an attractive communication medium for empowering members of remote communities and vulnerable populations (i.e., SCI) to take control of their physical health and social participation. As such, the group dynamics literature has directed attention to the effects of virtual groups on personal and social empowerment, most notably within the physical disability population.
1.4.3 Virtual group empowerment: determinants and consequences

The use of virtual peer groups in the health care context in general, has been shown to instil personal and social empowerment in patients, resulting in a reduced sense of social isolation (Demiris, 2006). Five key factors have been identified that influence virtual peer group empowerment: knowledge exchange and sharing, trust, intrinsic locus of control, design accessibility, and autonomy (Demiris, 2006). A common attribute of virtual groups that strengthens each of these factors is interactivity (e.g., a web-based weight loss program that includes email counselling) (Demiris, 2006). Furthermore, the extent to which the platform is perceived as easy to use with minimal errors or difficulties (i.e., usability) will influence its overall perceived usefulness (i.e., utility; Bellazzi et al., 2001; Nielsen, 2012)]. Therefore, the design accessibility, referred as the usability of internet-based communication platform (ICPs), is crucial for maximizing population reach in the health care context and, more specifically, individuals with functional limitations (e.g., SCI) (Demiris, 2006).

Considering the implications of virtual group usability for the disability population, ICPs should be physically and technologically accessible, and information should be tailored to meet the needs of the target population (i.e., personal information incentives) (Demiris, 2006). Furthermore, individuals with physical disabilities, such as SCI, require the information and technology literacy to access and utilize these virtual platforms (Tilley et al., 2006). Tilley and colleagues (2006) determined through an interview study which 12 adults with physical disabilities that perceived sense of control was a key factor for participants’ initiation and maintenance of ICP use. This sense of control was found to be a consequence of developing increased knowledge, empowerment and imagination of the possibilities of experiencing able-bodied functions in a virtual world (Tilley et al., 2006).

Despite the many benefits that ICP use has to offer to persons with physical disabilities, including SCI, there are many technical challenges associated with ICPs including issues with program utility, assistive technology software compatibility and Internet accessibility (O’Riley, 2014). In line with SCT (Bandura, 1997), self-efficacy has been shown to be a key theoretical construct that predicts persistence under these challenging circumstances (LaRose, 2001). Distal
predictors of persistence are positive outcome expectations and self-regulation of thoughts and beliefs during the early stages of mastery experience using ICPs (LaRose, 2001). Furthermore, personally valued incentives are what have been found to drive positive outcome expectations for using ICPs (Demiris, 2006; LaRose, 2001). For example, informational (i.e., tailored content), status (i.e., valued role model/leader) and social (i.e., interactivity) incentives have all been shown to be key attributes of attractive ICPs (LaRose, 2001). The effectiveness of these incentives, however, depends on vicarious learning (i.e., observing peers use the ICP), verbal persuasion (i.e., realistic and encouraging feedback) and the social diffusion of ICP innovations with instruction to enhance self-efficacy for using the ICP. Therefore, based on the principles of SCT, there is a combination of personal, environmental, and behavioural factors that can influence the use of ICPs. Through actual experience using the Internet (i.e., mastery experience) and observing others’ successes (i.e., vicarious learning), self-evaluations of one’s cognitions and behaviour and the formulation of behavioural expectations (i.e., outcome expectations, goal-setting, action planning) are posited to occur and guide future use of ICPs (LaRose, 2001).

Given the increasing importance of virtual groups for the physical disability population, it is imperative that future ICP-based self-management training interventions consider using the most accessible and usable platform. Videoconferencing (e.g., Skype®) is one type of ICP that is steadily becoming a preferred method of delivering self-management support among professionals and peers alike. The following section will outline the current research that has examined the use of videoconferencing within SCI-related rehabilitation and the current knowledge gaps that need to be addressed for future work in LTPA-related research.

1.4.4 Literature review of the delivery of self-management programs via ICPs

The current state of the self-management literature focused on ICP use within the SCI population has provided preliminary evidence to support videoconference as a promising rehabilitation delivery mode (King et al., 2014; Nield & Soo Hoo, 2012) for producing clinical and psychosocial outcomes in comparison to traditional, face-to-face rehabilitation programs
(Dorstyn et al., 2013; Phillips et al., 2001; Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011). However, these positive findings for delivering real-time self-management support have yet to be confirmed in a peer group and LTPA-related context in the SCI population.

The research that has been conducted in the SCI population has predominately focused on the delivery of physical therapies via videoconference (Galea et al., 2006; Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011). Based on this preliminary work, a videoconference platform appears to be a feasible mechanism to assist individuals in learning and practising self-management skills. Firstly, community-dwelling individuals living with SCI have recognized the value of videoconferencing in eliminating the burden of seeking transportation and travelling long distances to access specialty health care services (e.g., Galea et al., 2006; Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011). This may be especially useful for individuals in the earlier stages of SCI rehabilitation (Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011), where rather than having to travel to an outpatient clinic on a regular basis, videoconferencing provides newly discharged patients with the opportunity to acquire the cognitive and behavioural skills necessary for recovery in the comfort of their own home while simultaneously learning how to adapt and reintegrate into their home and community life (Galea et al., 2006; Nield & Soo Hoo, 2012; Sanford et al., 2006; Van Straaten et al., 2014; Woo et al., 2011). The ease in providing distant rehabilitation supervision via videoconference has prompted both researchers and clinicians to consider evaluating potentially positive clinical outcomes, such as reduced in-patient rehabilitation duration, and introducing self-management strategies earlier in the recovery process. In addition, videoconferencing can alleviate economic costs to the health care system (e.g., waitlists and health care professional home visits; Ekeland, Bowes & Flottorp, 2010). Currently, there is research to demonstrate the feasibility of monitoring patient progress and providing feedback on physical therapy exercises (Van Straaten et al., 2014), making adjustments to mobility devices (Sanford et al., 2006), and the teaching of proper skin self-care practices (Matthewson et al., 2000) in the comfort of one’s own home.

Overall, these findings suggest that videoconferencing may be a feasible option to employ for providing community-dwelling adults with SCI the tools to self-manage their LTPA behaviour.
However, no study to date has examined the feasibility of videoconferencing for delivering facilitated, group-based peer support LTPA programs within the SCI population. This is an important avenue for future research as a result of the growing body of evidence that adults with SCI are seeking large peer support networks and Internet-based sources for receiving LTPA-related resources (Faulkner et al., 2010; Letts et al., 2011).

In summary, videoconferencing has been shown to meet the physical and environmental needs of a diverse range of patients and community-dwelling individuals. Furthermore, a videoconference-delivery for health-related counselling holds the potential for improving an individual’s quality of life and healthcare delivery by increasing independence and being more readily accessible for other individuals who are dependent on closely supervised specialty health care. Indirectly, the positive health outcomes achieved through videoconference-based health care may lead to a reduction in hospitalization duration and ambulance services; resulting in reductions in cost-effectiveness for the individual and the health care system (Matthewson et al., 2000; Phillips et al., 2001). Currently though, there remains limited LTPA promotion research via videoconferencing (Wolfe et al., 2013) and, more specifically, group-based self-regulatory skill training using videoconferencing. Preliminary data by Wolfe and colleagues (2013) demonstrated that real-time LTPA sessions conducted over the Internet are perceived as feasible and of interest to individuals with SCI, and therefore have the potential to influence LTPA participation within the SCI population. However, further investigation of the feasibility of videoconference-style counselling for self-managed LTPA within the SCI population is warranted.

1.5 Concluding points

The literature described herein illustrates the need for further exploration into the use of ICPs for providing self-management assistance among LTPA intenders and actors with SCI. The following knowledge gaps remain within the aforementioned literature:

- Are adults with SCI receptive towards videoconferencing for LTPA support?
• What is the feasibility, acceptability and usefulness of facilitating informal self-help peer support in a virtual group context?

• What is the feasibility of delivering self-regulatory training via videoconference?

• What are the specific demographic groups (i.e., injury level, marital status, primary mode of mobility) in need of videoconference-delivered self-management peer support?

• Are other LTPA mindsets (i.e., intenders in addition to actors) receptive towards group-mediated LTPA self-management support, and specifically in a videoconference platform?

Given that adults with SCI are faced with a multitude of personal responsibilities related to their health (e.g. self-care and transportation; Martin Ginis et al., 2010; 2012), the burden of time and effort required to meet these demands imposes significant barriers to maintaining regular participation in LTPA. Videoconferencing may be an ideal platform to accommodate the self-management training needs within the SCI population.

1.6 General purpose of thesis

The general purpose of this thesis is to determine the feasibility of using a videoconference platform (i.e., Skype®) for delivering a peer support, group-based LTPA program for PA intenders and actors living with a SCI. To explore this potential strategy for promoting LTPA, a two-stage approach was taken in this thesis. The first phase (Study 1) involved the development and dissemination of a receptivity questionnaire related to Internet-based communication platforms (ICPs) to gain a better understanding of the ICP participation levels, attitudes, preferences and needs for engaging in a peer support program via videoconference in the target population. In the second phase of this thesis (Study 2), a pilot study was conducted to evaluate the feasibility of a 4-week LTPA peer support program delivered via Skype® group video chat. A description of each study objective is described in greater detail in the proceeding chapters.
Chapter 2

2 Study 1: Receptivity towards videoconference-delivered physical activity peer support programs among adults with spinal cord injury

2.1 Research objective

The objective of Study 1 was to examine the perceptions and preferences toward Internet-based communication platforms (ICPs) among LTPA intenders and actors with a SCI. LTPA intenders refer to participants who are not currently meeting the Physical Activity Guidelines for Adults with SCI (PAG-SCI; Martin Ginis, Hicks, et al., 2011) but report having an interest in adding an additional 20-minute bout of LTPA per week within the subsequent 2 months. LTPA actors, on the other hand, refer to participants who are currently meeting the PAG-SCI and who are interested in adding an additional 20-minute bout of LTPA per week in the subsequent 2 months (Schwarzer, 2008).

2.2 Research questions

The following four research questions were addressed in Study 1:

1. Which types of ICPs are LTPA intenders and actors using?

2. What are their attitudes towards ICPs?

3. Are LTPA intenders and actors receptive to the use of videoconferencing for engaging in peer-based support for LTPA participation?

4. Do preferences for videoconferencing differ across demographic characteristics of LTPA intenders and actors with SCI?

As this was an exploratory study, no hypotheses have been put forth, however the results will advance the currently limited knowledge on the receptivity of videoconference platforms for delivering LTPA-related peer support programs in the SCI population.
2.3 Method

2.3.1 Study design

A cross-sectional, survey-based design was used in the current study to examine the perceptions and preferences toward ICP-based LTPA peer support programs and, more specifically, using a videoconferencing platform, for adults with SCI who intend on increasing their LTPA (i.e., intenders and actors). The survey was administered using FluidSurveys®, an online survey software, between April 2015 and June 2015.

2.3.2 Participants

Participants were primarily recruited using an existing database of 522 individuals who had previously participated in research affiliated with a community-based LTPA research initiative, SCI Action Canada. This database is composed of previous participants of exercise-related interventions and prospective correlational study design research. A total of 175 individuals were contacted through email or telephone by the student investigator. Advertisement postings were also posted on provincial SCI organization websites (e.g., SCI BC and SCI Ontario) and social media platforms (e.g., Facebook and Twitter).

To be eligible for the study (see Appendix A), participants must have met the following inclusion criteria: 1) have a SCI for at least 12 months; 2) have the intention to add one bout (minimum of 20 minutes) of moderate-to-vigorous intensity LTPA (based on the PAG-SCI developed by Martin Ginis, Hicks, et al., 2011) to their weekly routine within the subsequent 2 months; 3) have Internet access; 4) be able to read and speak fluently in English; and 5) have no cognitive and/or memory impairments. Given that the objective of this study was to understand the perceptions and preferences towards Internet-based communication platforms, a purposive sampling method was used to target Internet users.

2.3.3 Measures

As part of the screening process, individuals were asked questions related to the following: contact information (i.e., email address and telephone number), injury-related information (i.e.,
date of SCI, injury level and severity), Internet access (yes/no), ability to speak and read in English (yes/no), cognitive and/or memory condition (yes/no), LTPA behaviour (yes/no), and intention to add one 20-minute bout of moderate-to-vigorous intensity LTPA in the subsequent 2 months (yes/no). The criteria used for assessing LTPA behaviour was meeting the PAG-SCI, which consists of: 1) 20 minutes of moderate-to-vigorous intensity aerobic activity, two days per week; and 2) strength-training exercises of each major muscle group, consisting of three sets of 8-10 repetitions for each exercise, two times per week (Martin Ginis, Hicks, et al., 2011). This was not mandatory criteria to meet for participation in the study.

The Internet-based communication platform (ICP) receptivity survey, a 56-item questionnaire, was developed by the student investigator based on previous literature related to virtual group dynamics (McKenna & Green, 2002; Nazzaro & Strazzaboso, 2009). The survey was organized into four sections: 1) participant background information; 2) participation in and social cognitions (i.e., attitudes, intentions, self-efficacy, barriers and facilitators) towards using a wide array of ICPs; 3) perceptions and preferences towards using videoconference-delivered LTPA peer support groups; and 4) perceptions and preferences towards the e-SMART program (piloted in Study 2). Appendix B provides all of the 56 survey items. Below is a description of each of these four sections within the ICP receptivity survey.

**Participant background.** Background information gathered included participant characteristics, current LTPA participation, and participation in offline social activities. The participant characteristics assessed included: demographics (i.e., age, gender, ethnicity, highest level of education, marital status, geographical location of residence [time zone and type of built environment]), injury-related factors (i.e., injury level, cause of injury, primary mode of mobility, number of years since injury), as well as information related to computer operation and accessories available (i.e., Internet broadband connection, computer operating system, and [built-in or external] webcam, speakers, and microphone).

**Participation in LTPA and offline social activities.** Participants’ current LTPA participation was assessed using the previously validated, self-report 7-day leisure-time physical activity questionnaire for adults with SCI (LTPAQ-SCI; Martin Ginis et al., 2012). A total of six
items from this instrument were used to collect data on weekly LTPA frequency (days/week) and duration (minutes per week) at mild, moderate and vigorous intensities. All items were preceded by the statement, “During the last 7 days, on how many days did you do...” and “On those days, how many minutes did you usually spend doing...” Participation in offline social activities (e.g., face-to-face social interaction) was assessed using two items. The first item related to offline social participation duration (number of hours) over the past 7 days, while the second item assessed participants’ satisfaction with their offline social participation within the past 6 months (1 = very dissatisfied, 5 = very satisfied).

**ICP participation and social cognitions.** Information regarding individuals’ participation in ICPs was gathered in two areas: general ICPs (e.g., discussion boards, email messaging, videoconferencing) and SCI and/or disability-specific (e.g., Canadian Paraplegic Message Board) online programs or social networking sites (e.g., Facebook, Twitter). Multiple selections were permitted for general types of ICPs used, while participation in SCI and/or disability-specific or social networking sites was assessed using a dichotomized (yes/no) response.

General perceptions of the value and enjoyment in participating in ICPs were assessed using two items (“To what extent do you VALUE online communication” and “To what extent do you enjoy using the Internet to interact with others [e.g., email, instant messaging or video-conference]”), both of which were rated on a 5-point Likert scale (1 = low value/I do not enjoy at all; 5 = high value/I enjoy very much). Two additional items asked participants to indicate whether the task (i.e., gaining new knowledge and different viewpoints; sharing experiences) and social (i.e., connecting with new people; connecting with like-minded people) related attributes of ICPs were appealing or unappealing. Multiple selections were permitted for the appealing and unappealing items.

A description of the purpose for delivering LTPA peer support via ICPs in a group setting (“...where you can communicate with other peers with SCI and learn important skills, strategies and resources for leading an independent and physically active lifestyle” [Heath et al., 2012]) preceded the next seven items:
The first two items were related to participants’ level of interest and likelihood in participating within an ICP for LTPA support ("How would you rate your level of INTEREST in becoming a member in this program?" and "How LIKELY would you join this kind of program?"). Both items were measured on a 5-point Likert scale (1 = completely uninterested/ unlikely; 5 = completely interested/likely). The third item was regarding preferred types of self-management lessons from a list of six strategies relevant for the SCI population (e.g., self-monitoring, goal-setting, action planning, and overcoming barriers (Arbour-Nicitopoulos et al., 2009; Arbour-Nicitopoulos, Tomasone, Latimer-Cheung & Martin Ginis, 2014; Brawley et al., 2013; Froehlich-Grobe, Lee, Aaronson, Nary, Washburn & Little, 2014; Kooijmans, Post, van der Woude, de Groot, Stam & Bussmann, 2015; Latimer et al., 2006; Warms, Belza, Whitney, Mitchell & Stiens, 2004; Zemper et al., 2003). Multiple selections were permitted for this item.

The level of perceived usefulness of interacting with peers in each category of LTPA participation (i.e., in comparison to the participant: greater, less or similar LTPA level) was measured through three items (e.g., "How USEFUL would it be for you to be able to discuss physical activity with individuals who are at a SIMILAR activity level as you?"). All three items were rated on a 5-point Likert scale (1 = completely useless; 5 = completely useful). The final item for this section assessed participants’ self-efficacy towards using ICPs for LTPA peer support ("How confident would you feel in discussing physical activity with someone you do not know?"). This item was rated on a 5-point Likert scale (1 = not at all confident; 5 = completely confident).

Preferences for videoconference-based LTPA peer support. Given the focus on videoconferencing within this thesis, this section of the ICP receptivity survey consisted of 18 items that focused specifically on videoconference-based platforms in a group setting.

The first ten items were regarding perceptions towards and preferences for group-based videoconference-delivered LTPA peer support programs. Firstly, participants were asked to rate their perceptions of the effectiveness of eight different group collaborative activities (e.g., small group, brainstorming, go-rounds, fishbowl [see Appendix B for a description of each of these activities]) that have been previously used to promote group cohesion in general (Nazzaro &
Strazzabosco, 2009), and within virtual settings (Mitchell, 2012). All items were preceded by the statement, “Please indicate the extent to which you believe each of the following GROUP COLLABORATIVE activities would promote your participation in the online physical activity support program described above...” All eight items were rated on a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). Secondly, participants’ receptivity towards group-based videoconference-delivered LTPA peer support programs was assessed using the following item, “To what extent would you feel comfortable sharing your ideas on a specific topic during a videoconference session,” and was rated on a 5-point Likert scale (1 = completely uncomfortable; 5 = completely comfortable). Finally, one item regarding mode of participation (e.g., during small group discussion; via hand raising) was used to assess preference(s) for communicating with group members and the group facilitator.

The next four items assessed participants’ preferences towards using a videoconference-based LTPA peer support program, in general: 1) need for assistive-based technology for computer accessibility (e.g., voice recognition; on-screen keyboards); 2) form of videoconference interaction (i.e., video or audio only); 3) preferred group facilitator characteristics (e.g., age and gender) and 4) preferred group member characteristics (e.g., similar injury level; similar LTPA goals). Multiple selections were permitted for all items with the exception of the preferred form of videoconference interaction item (yes/no scale response).

The final set of questions (four items) assessed current participation levels and barriers to group-based videoconference use. Participation levels were evaluated through: 1) frequency of engaging in videoconference-based communication (i.e., daily, weekly, occasionally, rarely or never); and 2) specific types of videoconferencing platforms used at any point in the past (i.e., Skype, FaceTime, Google Hangouts, Oovoo). Perceived barriers towards participation in videoconferencing-based platforms were assessed using two items that focused on: 1) technical factors (i.e., voice and audio quality); and 2) personal factors (i.e., time availability, physical appearance). These barriers were included based on previous literature examining the motives and consequences of virtual groups (Amichai-Hamburger & McKenna, 2006; McKenna & Bargh, 1999; McKenna & Green, 2002), as well as the feasibility of videoconference technology
use in education (Karabulut & Correia, 2008) and health care (Demiris, 2006; Taylor, Stone, Huijbregts, 2012; Tilley et al., 2006).

**Receptivity and social cognitions related to participating in e-SMART.** Participants were asked to provide their perceptions related to participating in the e-SMART program (see Study 2 for more details on this program). This group-based program was described in the ICP receptivity survey as a 4-week self-management online facilitated peer support program with the objective of having participants learn self-monitoring, goal-setting and problem-solving strategies for adding an additional bout of LTPA per week to their weekly routine. Participants were informed that this program would provide videoconference training.

Participants first indicated their receptivity towards the e-SMART LTPA peer support program using a yes/no response, “*Would you be interested in participating in this 4-week physical activity group support program via videoconference?*” Preferences towards the program were assessed using three items: 1) preferred duration per session (i.e., 20, 30, 45, or 60 minutes); 2) frequency of sessions per week (i.e., once, twice, more than twice, no preference); and 3) self-efficacy for participating in the e-SMART program rated on a 5-point Likert scale (1 = *not at all confident*; 5 = *completely confident*), “*How confident are you that you could participate in this group-based support program via videoconference over the next 2 months, if you were given all the assistance needed for orientation to the videoconference platform?*”

The survey concluded by asking participants to provide at least two days of the week and two time periods during the day that would be most convenient for them to participate in the e-SMART LTPA peer support program in the subsequent eight weeks. This 8-week period was the approximate time for when participants would be followed-up for Study 2 participant recruitment (refer to Study 2 for more details on recruitment strategy). Responses were provided in a calendar format with days ranging from Monday to Sunday and times specified in 30-minute increments, ranging from 11:00-11:30am to 8:30-9:00pm. This time period was selected to accommodate the extensive morning and evening routines commonly performed among persons with SCI (e.g., bathing, bowel/bladder management, meal preparation; Martin Ginis, Latimer, Hicks & Craven, 2005). Participants had the option to specify any scheduling concerns
that may impede their participation in the four consecutive weekly sessions that were planned for Study 2.

2.3.4 Pilot-testing

A pilot-testing phase was carried out over the course of three weeks in order to (a) ensure that the targeted population would be able to complete the ICP receptivity survey within a suitable duration of time (i.e., approximately 15-20 minutes), and (b) that the items included within the survey were comprehensible. Volunteers from the SCI Ontario Community Resource Centre were asked by a Community Resource Assistant if they would be interested in completing the survey online and provide verbal, face-to-face feedback to the student investigator. Over the course of 3 weeks, the student investigator received interest and met with three male volunteers with SCI to pilot-test the ICP receptivity survey. The volunteers were requested to comment on the comprehension of the questions, as well as the overall layout and design of the survey as a means to improve its’ clarity, conciseness, objectivity, and relevance for the target population. Following the first volunteer, each subsequent reviewer received an updated version of the online survey based on the previous respondent’s feedback. At the end of this pilot-testing phase, the survey was deemed feasible to be completed within the targeted 15 to 20 minute timeframe.

2.3.5 Procedure

Individuals who expressed interest in the online survey (via email and/or telephone correspondence) were subsequently contacted via telephone by the student investigator to confirm eligibility. Eligible participants received the online ICP receptivity survey immediately following the telephone screening. Follow-up reminder emails were administered at 48 hours post-screening to encourage individuals to complete the survey, and if necessary, 1 week following the initial dissemination of the survey. All survey respondents received a $10 electronic Starbucks gift card for their time given to this study.
2.3.6 Data analysis

Descriptive statistics (i.e., means, standard deviations, medians, frequencies and rankings) were used to describe the demographic profile, LTPA behaviour and social participation within the study sample, as well as the level of participation (Research Question #1), preferences and perceptions related to ICP use (Research Question #2) and specifically, videoconferencing (Research Question #3). Pearson chi-square tests were conducted to assess relationships between the key demographic variables and videoconference preferences and barriers (Research Question #4). All chi-square tests used 2x2 contingency tables and were set at a $p$ value of $\leq 0.05$. Post-hoc analyses for significant chi-square tests (i.e., odds ratio) were calculated to report the likelihood of a particular demographic subgroup being associated with the variable under examination.

To inform the delivery of online LTPA peer support in intenders and actors with SCI, the level of participation in (Research Question #1) and preferences towards (Research Question #2) ICPs were examined as a function of PAG-SCI status (i.e., meeting vs. not meeting the PAG-SCI). In addition to PAG-SCI status, the following five demographic and injury-related characteristics were examined for group differences as part of Research Question #4: age, gender, number of years post-injury, injury level, and primary mode of mobility. These demographic characteristics have been identified in previous literature as key characteristics to target for LTPA-enhancing interventions (Martin Ginis et al., 2010), and specifically, interventions involving peer support (Latimer-Cheung et al., 2013, Sherman et al., 2004). All cut-points for the continuous variables were based on the median scores within the sample: age (median: $< 45$ years [$n = 15$] vs. $\geq 45$ years [$n = 15$]), number of years post-injury (median: $< 20$ years [$n = 15$] vs. $\geq 20$ years [$n = 15$]). The remaining categorical variables were defined as: PAG-SCI (meeting the aerobic and/or strength-training guidelines = Meeting the PAG-SCI [$n = 11$]; neither meeting the aerobic guidelines nor the strength-training guidelines = Not meeting the PAG-SCI [$n = 19$]), injury level (tetraplegia [$n = 15$] vs. paraplegia [$n = 15$]), and primary mode of mobility (manual wheelchair users [$n = 19$] vs. power-assisted wheelchair users [$n = 11$]).
In line with the statistical assumptions for non-parametric tests (c.f., Field, 2009), all reported chi-square statistical data maintained a minimum expected frequency of five participants for each of the cells within the 2x2 contingency tables. Missing data are reported within the appropriate tables.

2.4 Results

2.4.1 Participant characteristics

Among the 32 surveys administered, a total of 30 surveys were completed for the current study. Characteristics of the study sample (N = 30) are presented in Table 3. Participant recruitment was completed when the projected number of completed surveys (N = 30) was reached. Overall, 32 individuals were recruited and administered the ICP receptivity survey, with two no responses. The majority of participants were white (73%) males (73%) with a post-secondary education (77%), and were living in urban neighbourhoods (73.3%) that were located within the Eastern Time Zone (80%). The mean age of the sample was 45.27 years (SD = 10.63 years), and mean number of years post-injury was 20.50 (SD = 12.3 years). The sample included an equal proportion of persons with paraplegia (n=15) and tetraplegia (n=15). In terms of computer accessibility, the primary computer operating system and mode of Internet connection used by participants was Windows (76.7%) and cable modem (46.7%), respectively. The majority of participants reported having access to a webcam (73.3%), microphone (73.3%), and speakers (96.7%).
Table 3.

Participant Characteristics \((N = 30)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>(n) (%)</th>
<th>(M \pm SD)</th>
<th>Median</th>
<th>Interquartile range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years post-injury</td>
<td></td>
<td>20.50 ± 12.30</td>
<td>19.0</td>
<td>10.50-29.25</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>45.27 ± 10.63</td>
<td>45.0</td>
<td>38.0-52.0</td>
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<tr>
<td>Gender</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Female</td>
<td>8 (26.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22 (73.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury level</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tetraplegia</td>
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<tr>
<td>Paraplegia</td>
<td>15 (50)</td>
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<tr>
<td>Injury severity</td>
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<tr>
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<tr>
<td>Other*</td>
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</tr>
<tr>
<td>Injury cause</td>
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<tr>
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<tr>
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<tr>
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<td>Count (Percentage)</td>
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<tr>
<td>--------------------------</td>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
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<tr>
<td>Widowed</td>
<td>1 (3.3)</td>
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<tr>
<td>Time zone</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pacific</td>
<td>4 (13.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain</td>
<td>1 (3.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central</td>
<td>1 (3.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern</td>
<td>24 (80.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighbourhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>8 (26.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>22 (73.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode of Internet connection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable modem</td>
<td>14 (46.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Subscriber Line (DSL)</td>
<td>3 (10.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber optic technology</td>
<td>2 (6.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satellite</td>
<td>7 (23.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer operating system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacIntosh</td>
<td>5 (16.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td>23 (76.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2 (6.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Webcam Available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22 (73.3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8 (26.7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speakers Available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29 (96.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1 (3.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microphone Available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22 (73.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8 (26.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. M = mean; SD = standard deviation. *Other category for non-traumatic SCI: Spina bifida.
2.4.2 Current leisure-time physical activity behaviour and offline social participation

Table 4 provides an overview of the values for LTPA behaviour and offline social participation. Participants reported engaging in a mean of 1.33 days ($SD = 1.92$) and 21.07 minutes ($SD = 30.33$) of moderate-to-vigorous intensity aerobic LTPA over the previous 7 days. Meanwhile, the mean number of days and minutes within the last 7 days that participants reported engaging in moderate-to-vigorous intensity strength-training LTPA were 0.90 days ($SD = 1.18$) and 13.50 minutes ($SD = 17.22$), respectively. Frequency analyses indicate that 10% of the sample was meeting the PAG-SCI, while 26.7% of the sample was partially meeting the recommendations (i.e., either the aerobic or strength-training recommendations).

Meanwhile, participants reported a mean of 7.43 hours ($SD = 12.70$) per week of face-to-face social participation outside the home/rehabilitation centre, with 33.3% of the sample reporting no social participation outside the home whatsoever. Additionally, almost one-third of the sample reported being ‘very satisfied’ (30%) and ‘somewhat satisfied’ (30%) with their social participation outside the home within the last 6 months.
Table 4.

Descriptive Statistics for Leisure-Time Physical Activity Behaviour and Offline Social Participation Behaviour

<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate-vigorous Aerobic LTPA</td>
<td></td>
</tr>
<tr>
<td>Minutes ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>21.07 ± 30.33 (10.00 [0.00-31.88])</td>
</tr>
<tr>
<td>Days ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>1.33 ± 1.92 (1.00 [0.00-2.00])</td>
</tr>
<tr>
<td>% meeting aerobic LTA guidelines (%)</td>
<td>20</td>
</tr>
<tr>
<td>Moderate-vigorous Strength-Training</td>
<td></td>
</tr>
<tr>
<td>Minutes ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>13.50 ± 17.22 (0.00 [0.00-30.00])</td>
</tr>
<tr>
<td>Days ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>0.90 ± 1.18 (0.00 [0.00-2.00])</td>
</tr>
<tr>
<td>% meeting guidelines (%)</td>
<td>26.7</td>
</tr>
<tr>
<td>Face-to-face social participation</td>
<td></td>
</tr>
<tr>
<td>Hours/week ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>7.43 ± 12.70 (3.00 [0.00-10.00])</td>
</tr>
<tr>
<td>% no offline social participation (%)</td>
<td>33.3</td>
</tr>
<tr>
<td>Satisfaction ((M \pm SD, \text{Median [Interquartile Range]}))</td>
<td>3.57 ± 1.30 (4.00 [2.00-5.00])</td>
</tr>
<tr>
<td>Satisfaction (n %()</td>
<td></td>
</tr>
<tr>
<td>Very dissatisfied (2 (6.7))</td>
<td></td>
</tr>
<tr>
<td>Somewhat dissatisfied (6 (20.0))</td>
<td></td>
</tr>
<tr>
<td>Neutral (4 (13.3))</td>
<td></td>
</tr>
<tr>
<td>Somewhat satisfied (9 (30.0))</td>
<td></td>
</tr>
<tr>
<td>Very satisfied (9 (30.0))</td>
<td></td>
</tr>
</tbody>
</table>

*Note. M = mean; SD = standard deviation.*
2.4.3 Research question #1: What types of Internet-based communication platforms are leisure-time physical activity intenders and actors using?

The three most commonly used ICPs (currently or previously) that were reported included: email messaging (96.7%), discussion forums (53.3%), and videoconferencing (50%). One participant indicated that videoconferencing was used for verbal communication only (no webcam use). Furthermore, the majority of participants (83.3%) reported using social networking sites (e.g., Facebook, Twitter) or SCI and/or disability specific online programs (e.g., Canadian Paraplegic Message Board).

Frequencies for ICP use according to PAG-SCI status are provided in Table 5. Overall, survey respondents who were not meeting the PAG-SCI reported more frequent use of the measured ICP than those participants who were meeting the PAG-SCI.
Table 5.

Internet-Based Communication Platform (ICP) Reported Usage (Types) According to Physical Activity Level, Ranked by Highest Rates of Prevalence (N = 30)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Type of ICP</th>
<th>Total (N = 30)</th>
<th>Meeting the PAG-SCI** (n = 11)</th>
<th>Not meeting the PAG-SCI (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>Email messaging</td>
<td>29</td>
<td>96.7</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Instant messaging/SMS</td>
<td>23</td>
<td>76.7</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Discussion forums</td>
<td>16</td>
<td>53.3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Videoconference</td>
<td>15</td>
<td>50</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Public chat rooms</td>
<td>9</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Other*</td>
<td>2</td>
<td>6.7</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>None</td>
<td>1</td>
<td>3.3</td>
<td>1</td>
</tr>
</tbody>
</table>

*Audio only videoconference (n = 1) and text communication (n = 1).
**Meeting the PAG-SCI: entirely or partially (e.g., only 20 minutes of moderate-to-heavy intensity aerobic activity, twice per week).
1Percentage of total sample size within each type of ICP.
2.4.4 Research question #2: What are leisure-time physical activity intenders’ and actors’ attitudes and preferences towards using Internet-based communication platforms?

**Attitudes.** Most participants reported high value ($M = 4.10$ out of 5, $SD = 0.84$) and level of enjoyment ($M = 4.13$ out of 5, $SD = 0.78$) towards using ICPs. The four most appealing attributes of ICPs rated by participants were: connecting with like-minded people (80%), gaining new knowledge and different viewpoints (73.3%), real-time communication (63.3%) and easy access to communication and support (63.3%). The top three attributes of ICPs that were perceived as unappealing were: privacy concerns (60%), hostility or aggressive tone of discussions (56.7%), and lack of personal connection (46.7%).

**Preferences.** Participants perceived the usefulness of having peers in an online LTPA peer support group who were either more physically active ($M = 3.97$, $SD = 1.03$, median = 4.0 [interquartile range: 3.75-5.00]; 43.3% useful) or at a similar LTPA level ($M = 3.93$, $SD = 1.05$, median = 4.0 [interquartile range: 3.00-5.00]; 40.0% useful) than themselves. The three most preferred self-management strategies to be taught in an online LTPA peer support group included: overcoming physical activity barriers (56.7%), self-monitoring (40%) and obtaining community-based resources (40%; see Table 6).
Table 6.

Preferred Leisure-Time Physical Activity Self-Management Lesson Reported for Internet-Based Communication Platform Peer Support According to Physical Activity Level, Ranked by Highest Rates of Prevalence (N = 30)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Lesson preference</th>
<th>Total (N = 30)</th>
<th>Meeting the PAG-SCI (n = 11)</th>
<th>Not meeting the PAG-SCI (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>Overcoming LTPA barriers</td>
<td>17</td>
<td>56.7</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Self-monitoring</td>
<td>12</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Obtaining community-based resources</td>
<td>12</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Action planning</td>
<td>11</td>
<td>36.7</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Goal-setting</td>
<td>10</td>
<td>33.3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Building social relationships</td>
<td>6</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Nothing</td>
<td>3</td>
<td>10</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Other</td>
<td>1</td>
<td>3.3</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Multiple self-management item selections were permitted.

1Percentage of total sample size within each type of ICP
2.4.5 Research question #3: Are leisure-time physical activity intenders and actors receptive to the use of videoconferencing for engaging in leisure-time physical activity peer support?

**Videoconference use.** The majority of the sample (46.6%) reported using videoconferencing on a daily, weekly or occasional basis compared to 30% of the sample who reported rarely engaging in videoconference communication. The most common type of videoconference platform used by participants was Skype® (70%), with the majority of respondents reported using the Skype® platform on a daily, weekly or occasional basis (61.9%). Other types of videoconference platforms reported having been used in the past were: FaceTime (40%), Google Hangouts (13.3%) Oovoo (3.3%) and other specified platforms (Ontario Telehealth Network and WebEx; 10%).

**Attitudes and level of self-efficacy towards using ICPs and videoconferencing.** The majority (56.7%) of participants reported being somewhat interested ($M = 3.67$ out of 5, $SD = 0.96$) and likely ($M = 3.43$ out of 5, $SD = .90$) to join an online LTPA peer support program. On average, 30% of participants reported being somewhat confident in discussing LTPA with new individuals, in general ($M = 4.00$ out of 5, $SD = 1.05$). Furthermore, 36.7% of participants reported being somewhat comfortable in sharing ideas with their group members in a videoconference setting ($M = 3.47$ out of 5, $SD = 1.36$).

**Videoconference platform preferences.** The majority (70%) of participants did not report any preference for audio-only or video-based communication. The most commonly reported ideal type of peer to interact with in a videoconference setting was an individual who had a similar level of injury (66.7%) and similar LTPA goals (73.3%). Meanwhile, the preferred type of videoconference group facilitator was reported to be a fellow peer with an SCI (40%) and someone who had prior experience facilitating support groups (60%). Three types of group collaboration methods that were most frequently reported to be effective methods for promoting participation and engagement in videoconference-delivered group discussions were non-discussion based participation among each individual group member on a specific question (i.e., go-rounds; 26.7% strongly agree, 30% somewhat agree; $M = 2.40$ out of 5, $SD = 1.19$), whole
group reflection (i.e., brainstorming; 13.3% strongly agree, 40.0% somewhat agree; \(M = 2.70\) out of 5, \(SD = 1.24\)), and having peers reiterate ideas expressed by other group members (i.e., active listening, 20.0% strongly agree, 33.3% somewhat agree; \(M = 2.37\) out of 5, \(SD = 0.96\)). Meanwhile, the least preferred group collaboration method was “dividing the group into smaller groups or partners with similar viewpoints for further discussion” (i.e., caucusing; 3.3% strongly agree, 20% somewhat agree; \(M = 2.87\) out of 5, \(SD = 0.73\)). Most participants (46.7%) preferred to participate in group discussions via videoconference only when a hand-raising signal was given to the group facilitator.

**Needs and barriers to using videoconference platforms.** The majority of the survey respondents (60%) did not report needing an assistive device (e.g., voice recognition, trackball, on-screen keyboard) to participate in videoconference platform. Meanwhile, the most commonly selected assistive device reported by the remaining portion of the sample (40%) as necessary to participate in videoconference platforms was a trackball (23.3%), which is a pointing device used to perform the same functions as a computer mouse (i.e., navigate through computer screen and perform selection and positioning functions). The most frequently reported personal barriers to communicating via videoconference were time availability (70%), and family and work commitments (53.3%). The most frequently reported technical barrier for communicating via videoconference was privacy/security concerns (36.7%).

**e-SMART program receptivity.** The e-SMART program received interest from 60% of the sample, with 23.3% of respondents being somewhat confident and 16.7% being completely confident in participating in this program \((M = 3.00\) out of 5, \(SD = 1.36\)). Among those respondents who indicated their ideal videoconference session frequency and duration \((n = 16)\), the most preferred frequency of the e-SMART program was once a week (68.8%), while the most preferred session duration was 20-30 minutes (81.3%). All survey respondents who provided their weekly time availability to participate in the e-SMART program (minimum: 2 time periods; maximum: 61 time periods; \(n = 20\)), specified availability on weekdays, whereas only 20% specified availability during weekends. On weekdays, the three most frequently
selected preferred time periods were 11:00am-11:30am (30%), 2:30pm-3:00pm (20%) and 4:00pm-4:30pm (20%).

2.4.6 Research question #4: Do videoconferencing needs, barriers and preferences differ across demographic characteristics of leisure-time physical activity intenders and actors with spinal cord injury?

The complete set of chi square results are tabulated in Appendix D according to demographic (i.e., age, number of years post-injury, injury level and primary mode of mobility) and PAG-SCI status differences among all barrier and preference variables examined in Research Question #3 that met the assumptions of the chi square statistical analysis (both significant and no-significant values). Results from these chi-square analyses indicated that family and work commitment was the only barrier towards videoconference participation that was significantly associated with any of the five examined demographic variables, with a significant group difference found for age ($\chi^2(1) = 8.57, g = -.535$). Post-hoc analyses indicated that participants who were younger than 45 years old were 11.11 times more likely to experience family and work related barriers versus individuals 45 years of age and older (see Appendix D for frequencies and phi effect sizes). No group differences were found for any of the videoconference needs and preference items.

2.4.7 Implications for study 2

Overall, Study 1 findings suggest that videoconferencing is a well-received type of ICP for delivering LTPA peer support programs to intenders and actors with SCI. Based on these findings, Table 7 outlines a proposed ‘ideal’ structure for an online peer-support LTPA self-management program (called e-SMART) delivered via videoconference. In the second phase of this thesis (i.e., Study 2), a pilot test is conducted to examine the feasibility of delivering this e-SMART program.
Table 7.

*Proposed Ideal Structure of a Videoconference Peer Support Session*

<table>
<thead>
<tr>
<th>Variable</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Type</td>
<td>Skype® (70% have previously used)</td>
</tr>
<tr>
<td>Session duration</td>
<td>30 minutes (23.3% of sample)</td>
</tr>
<tr>
<td>Session frequency</td>
<td>Once per week (36.7% of sample)</td>
</tr>
<tr>
<td>Time of the week (weekday vs. weekend)*</td>
<td>Weekdays (65% of sample)</td>
</tr>
<tr>
<td>Time of the day*</td>
<td>Morning: 11:00-11:30am (30%)</td>
</tr>
<tr>
<td>Video call or Audio only preference</td>
<td>No preference (70% of sample)</td>
</tr>
<tr>
<td>Best method of group collaboration</td>
<td>Go-Rounds (30% somewhat in favour)</td>
</tr>
</tbody>
</table>

* n = 20.
Chapter 3

3 Study 2: Feasibility, acceptability and usefulness of delivering a leisure-time physical activity peer support program via videoconference for adults with spinal cord injury

3.1 Research objective

The objective of Study 2 was to examine the feasibility, acceptability, and usefulness of delivering an LTPA peer support program via Skype® group video chat to LTPA intenders and actors living with SCI. The program content and facilitator conduct were adapted from a previously pilot-tested LTPA-enhancing GMCB intervention for adults living with SCI (Brawley et al., 2013). The current pilot study used an in-depth process to examine the feasibility of adapting Brawley and colleagues’ (2013) GMCB intervention in a videoconference platform. The aim of this study was to generate knowledge on the: 1) acceptability; 2) fidelity; 3) practicality; and 4) adaptability (Bowen et al., 2010; Nielsen, 2012) of delivering an LTPA peer support program via videoconference. Bowen and colleagues (2010) propose that these four indicators of feasibility will inform future interventionists on appropriate evidence-based strategies for implementing novel interventions (i.e., virtual group settings) and meeting the objectives of health promotion programs (i.e., enhancing LTPA) in the target population. Additionally, the usefulness of delivering this program via Skype® was evaluated through key indicators of usability (i.e., perceived ease and efficiency of performing tasks using the online e-SMART program) and utility (i.e., the level of functionality of the e-SMART program for meeting task and social needs) (Nielsen, 2012). This evaluation process will inform best practices for the future design and implementation of videoconference-delivered LTPA peer support interventions for LTPA intenders and actors living with SCI.

3.2 Research questions

The following three key research questions were addressed in the Study 2:
1. Is the videoconference-delivered peer support program delivered as intended (fidelity) and meeting the participant’s needs and preferences (feasibility)?

2. How engaged and receptive are participants with the e-SMART program (acceptability)?

3. How much learning and group collaboration is occurring through the videoconference platform (usefulness)?

Based on previous research demonstrating that ICPs (e.g., videoconferencing) can feasibly replicate face-to-face interactions for both social bonding and education purposes in persons living with physical disabilities (e.g., Taylor, 2012; Tilley et al., 2006), positive evaluations were expected for the e-SMART program’s feasibility, acceptability, and usefulness from participants engaging in the videoconference-delivered peer support program.

3.3 Method

3.3.1 Study design

A prospective, within-subjects, pre-post study design with a treatment-only group was used to pilot the feasibility, acceptability and usefulness (i.e., usability and utility) of delivering a 4-week, LTPA peer support program via group videoconferencing (Skype®). See Figure 2 for a detailed outline of the study protocol.

3.3.2 Participants

Survey respondents from an Internet-based Communication Platform Usage and Receptivity survey ($N = 30$; Study 1) who consented to being contacted for future research involvement ($n = 29$) were immediately contacted via telephone by the student investigator to determine interest and eligibility for the 4-week Skype® group videoconference-delivered LTPA peer support program (called e-SMART).

In order to be eligible for the study (see Appendix E), participants must have met the following inclusion criteria: 1) intend on adding one 20-minute bout of LTPA to their weekly routine; 2)
have Internet access; 3) able to connect a webcam, microphone and speakers to a computer; 4) able to complete online surveys; 5) not have any cognitive and/or memory impairment; and 6) able to understand, read, write and speak in English. A sample size of 12 participants (six per group) was determined a priori based on previous findings supporting the delivery of group fitness classes through videoconference in groups of four or five adults with SCI (Wolfe, Walia, Chapman, Ravenek, Chapman, Fraser, Askes, 2013). This projected sample size also accounts for the recruitment and participant adherence challenges known within the study population (Martin Ginis & Hicks, 2005).

Eligible participants ($N = 10$) were assigned to one of two groups based on time availability ($n = 5$ in both groups). A time zone conflict resulted in one of the five participants in Group 2 to drop out prior to the commencement of the first session, resulting in a final sample size of five participants in Group 1 and four participants in Group 2. Figure 2 outlines participant recruitment and attendance from Study 2 recruitment to Program Follow-Up assessment.
Consent to being contacted in the future ($N = 29$)
- Express interest in the 4-week e-SMART program ($n = 18$)

**PHASE 1 ONLINE SURVEY**

**TELEPHONE FOLLOW-UP INTERVIEW**
Eligible ($N = 11$)
- Group 1 ($n = 6$)
- Group 2 ($n = 5$)

**BASELINE ($N = 11$)**

**VIDEOCONFERENCE TUTORIAL ($N = 10$)**

---

**4-week e-SMART program**

- **SESSION 1**
  - Group 1 ($n = 5$)
  - Group 2 ($n = 4$)
  - Post-session survey ($n = 9$)
- **SESSION 2**
  - Group 1 ($n = 4$)
  - Group 2 ($n = 3$)
  - Post-session survey ($n = 7$)
- **SESSION 3**
  - Group 1 ($n = 5$)
  - Group 2 ($n = 4$)
  - Post-session survey ($n = 9$)
- **SESSION 4**
  - Group 1 ($n = 4$)
  - Group 2 ($n = 4$)
  - Post-session survey ($n = 8$)

Program Follow-Up
Post-session survey ($n = 9$)

---

*Figure 2.* Study 2 participant recruitment and participation.
3.3.3 Pilot-testing

The 4-week e-SMART program is a condensed version of a 7-week GMCB intervention that was successfully delivered in a previous study, using a face-to-face environment, to promote self-managed LTPA among actors living with SCI (Brawley et al., 2013; see Table 1). The participant and group facilitator program manual which were used for the 7-week GMCB intervention have undergone previous content validity (Brawley et al., 2013), and, for the purpose of the current feasibility study, were adapted into 4-week session manuals (see Appendix L for the e-SMART participant activity manual and Appendix M for the e-SMART facilitator session guide). As a feasibility study, it was essential that the adapted e-SMART participant activity manual included content that related to operating the videoconference platform and leading virtual group activities. Therefore, the participant manual included a step-by-step Skype® instruction guide (e.g., software installation, how to navigate through the audio and video settings) and the facilitator session guides outlined specific leadership strategies for facilitating group collaborative activities within a videoconference environment (e.g., instant messaging for brainstorming activities). These leadership strategies have been shown to be receptive among LTPA intenders and actors with SCI (refer to Study 1 results). The addition of a Skype® instruction guide was included, based on previous research indicating the need to increase participants’ self-efficacy in using the Skype® videoconference platform (Stapleton, 2014). To further enhance participants’ self-efficacy for using Skype®, a large focus of the e-SMART program was directed towards providing opportunities for group collaboration. Therefore, the e-SMART participant activity manual only provided an overview of three of the four self-regulatory tools (i.e., self-monitoring, goal-setting, and problem-solving [Arbour-Nicitopoulos, Martin Ginis, & Latimer, 2009; Latimer-Cheung et al., 2013; Martin Ginis et al., 2013]) that were targeted in Brawley and colleagues’ (2013) GMCB intervention in order to primarily focus on motivating and reinforcing the formation of a common group LTPA goal in a 4-week time-frame (Brawley et al., 2014; Cartwright, 2008) among a sample of both LTPA intenders and actors. See Table 8 for a comparison between the e-SMART LTPA peer support program and Brawley and colleagues GMCB intervention.
Two separate pilot-tests of the first session outlined in the e-SMART manual were conducted prior to starting the study with eight undergraduate and graduate Kinesiology students. The purpose of this pilot-testing was to prepare the group facilitator and research assistants (G.N. & R.S.) for: (a) navigating through the Skype® platform, (b) the delivery of the group collaborative activities, (c) providing troubleshooting assistance (if required), (d) the monitoring of context-relevant language and online behaviour that may be indicative of group collaboration (e.g., examples of injunctive and descriptive social norms); and (e) practice recording the session observation checklist frequency data (research assistants). Based on previous literature, social norms were identified through statements related to LTPA behaviour that was perceived as approved or expected (e.g., “You ought to be active.”; injunctive norm [Priebe, 2013, p. 8]), as well as statements that were indicative of awareness of the commonality of certain types of LTPA behaviour in various groups (e.g., “I often see other people wheeling in my neighborhood”; descriptive norm [Ball et al., 2010, p. 3]).
Table 8.

*Similarities and Differences Between Brawley et al.’s (2013) Group-Mediated Cognitive Behavioural Intervention and the e-SMART Program*

<table>
<thead>
<tr>
<th></th>
<th>Similarities</th>
<th>Differences</th>
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<tbody>
<tr>
<td>Study design</td>
<td>Pilot study</td>
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<td>Pre- and post-testing</td>
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<td>Within-subjects</td>
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<td>Theoretical framework</td>
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<td></td>
<td>Group Dynamics Theory</td>
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<tr>
<td>Target population</td>
<td>SCI adults (18-64 years old)</td>
<td>Brawley et al. (2013): only LTPA actors</td>
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<tr>
<td></td>
<td></td>
<td>e-SMART: LTPA intenders and actors</td>
</tr>
<tr>
<td>Intervention delivery mode</td>
<td>Group-mediated</td>
<td>Brawley et al. (2013): face-to-face (weeks 1-7) and telephone follow-up session with the facilitator (week 9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e-SMART: videoconference</td>
</tr>
<tr>
<td>Intervention duration</td>
<td>1 session/week (60 minute sessions)</td>
<td>Brawley et al. (2013): 7-week Intensive phase + 3-week Transition phase</td>
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<tr>
<td></td>
<td></td>
<td>e-SMART: 4 weeks in total</td>
</tr>
<tr>
<td>Intervention content</td>
<td>Self-monitoring</td>
<td>Brawley et al. (2013): Relapse prevention</td>
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<tr>
<td></td>
<td>Goal-setting</td>
<td>e-SMART: one-on-one videoconference tutorial; session 1 theme was dedicated to Skype®</td>
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<td></td>
<td>Problem-solving</td>
<td>orientation and building group identity</td>
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<tr>
<td>Outcome measures</td>
<td>Program fidelity and usability</td>
<td>e-SMART: Acceptability and utility evaluation; video-conference quality</td>
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<td></td>
<td>usability</td>
<td>feedback; group</td>
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<td>Group development measures</td>
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<td>Self-managed LTPA</td>
<td>development check</td>
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<td>Self-regulatory behaviour</td>
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3.3.4 Measures

For an overview of the instruments described below as well as their respective administration period, please refer to Appendix K.

Session observation checklist (see Appendix I). A session checklist was completed during each of the four e-SMART sessions by the research assistant to evaluate key indicators of feasibility, acceptability, and usefulness (see Table 9). These ‘indicators’ related to session and section duration, and number of group interruptions (feasibility); participant attendance and participation in the buddy system (acceptability); and the extent to which group collaboration (McKenna & Green, 2002), and technical difficulties and troubleshooting occurred (usefulness). Below is a detailed description on how each of these indicators was recorded within the checklist.

Program feasibility was assessed using three aspects of session implementation fidelity: 1) adherence, 2) dosage, and 3) delivery quality (Carroll, Patterson, Wood, Booth, Rick & Balain, 2007). Adherence was measured by recording the number of planned tasks (e.g., group introductions) completed in each session guide (see Appendix M), where session 1 had seven planned tasks and sessions 2, 3 and 4 each had four planned tasks. Dosage referred to the overall session duration (in minutes) and the duration of each planned task (in minutes). The expected total duration of each session was 60 minutes, while the expected duration of each planned task within each of the sessions was: 1) Introduction (8 minutes), 2) Review/Homework (10 minutes), 3) Group Lesson/Collaboration (30 minutes), and 4) Debrief (12 minutes). The delivery quality of each session was measured by the presence of any interruptions that interfered with the progression of the group discussions and collaborative activities (e.g., participant interjections and external interruptions such as family or phone calls).

Program acceptability was assessed according to participant engagement both during and between each session. Participant engagement during the sessions was assessed according to participants’ session attendance rate and opting to use the Skype® video function (versus audio only communication). Participant engagement between each session was identified through the
buddy system information gathered during the homework section of sessions 2, 3 and 4 (i.e., the total number of paired and group interactions that were initiated between each session; and the mode of these interactions [i.e., videoconference, email or telephone]).

Program usefulness was assessed according to two key quality attributes of web-based user interfaces: 1) usability; and 2) utility (Nielsen, 2012). Usability represents the extent to which a particular interface (i.e., videoconference software) enables users to perform tasks easily and efficiently at the initial introduction and after an extended period of inactivity with minimal errors or complications, whereas utility represents the functionality of the user interface, or the extent to which the functions of the interface meets the user’s contextual needs (Nielsen, 2012).

For the purpose of Study 2, usability was objectively evaluated based on participants’ ability to operate the Skype® functions at ease with minimal technical difficulties and the ability of the virtual group to help solve any technical difficulties that may occur. During the sessions, the research assistant recorded the following usability attributes of the Skype® platform: 1) the mode and frequency of technical difficulties (i.e., logging into the Skype® program, connecting to the group conversation, poor video and/or audio quality expressed by the participants); and 2) the source of troubleshooting support (i.e., group facilitator, peers, research assistant; or self-directed).

Utility was objectively evaluated based on the study’s objective of meeting the participants’ task and social needs through group collaboration (i.e., LTPA self-regulatory skill learning and emotional support). The research assistant recorded the frequency at which task and social needs were being met during the videoconference sessions, according to three key indicators of group collaboration that are identified within the virtual group dynamic literature (e.g., AmiChai-Hamburger et al., 2008; Demiris, 2006; McKenna & Green, 2002): 1) sharing (i.e., experiences, opinions, and problem solving strategies); 2) social norms (i.e., positive feedback, number of commonalities and differences expressed); and 3) mode of collaboration (e.g., screen sharing, file sharing, and instant messaging using Skype®).
Table 9.

*Summary of the Key Indicators of Program Feasibility, Acceptability and Usefulness that were Assessed through the Session Checklists*

<table>
<thead>
<tr>
<th>Program indicators</th>
<th>Indicator description</th>
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| Feasibility        | • Adherence (number of tasks completed)  
                      • Dosage in minutes (session and sections)  
                      • Delivery quality (frequency of group interruptions) |
| Acceptability      | • Session attendance (4 in total)  
                      • Skype® video versus audio only function (frequency)  
                      • Buddy system interactions (mode and frequency) |
| Usefulness         | • Type of technical difficulty (frequency)  
                      • Troubleshooting duration  
                      • Troubleshooting support source (frequency) |
| Usability          | • Group collaboration (frequency): Sharing, social norms, collaborative activities |
Post-session participant surveys. Following each of the four e-SMART Skype® sessions, participants were administered the Skype® quality feedback survey to assess usability of the videoconference platform. Participants rated the level of ease in performing the Skype® functions and navigating through the Skype® platform in the previous session using a 9-item Skype® quality feedback survey (Appendix G). Seven items were used to assess the quality in using the Skype® functions (e.g., screen sharing) on a 5-point Likert scale ranging from 1 (very poor) to 5 (excellent). In the case that a particular function was not applicable to the previous session, there was an option for participants to select “Not Applicable.” The statement preceding each of the seven items was, “During today’s videoconference session, how would you rate...” Cronbach’s alpha for the scale was .89 at both session 1 and 4. Two additional items were separately assessed to examine participants’ level of ease in navigating through the Skype® videoconference platform and solving technical difficulties, both of which were evaluated using a 5-point Likert scale ranging from 1 (extremely difficult) to 5 (extremely easy).

Group development check (sessions 1 and 4). To examine changes in group dynamics through the e-SMART program and ultimately program usefulness, participants completed the following instruments within the online survey that contained the Skype® quality feedback survey during the first (week 1) and final (week 4) sessions: 1) Usefulness of the program content; 2) Usefulness of the group; and 3) Usefulness of the group facilitator. Below is a detailed description of the instruments used to assess each of these outcomes.

Usefulness of the program content (see Appendix H). Participants’ understanding and perceived usefulness of the e-SMART program lessons (i.e., LTPA benefits and self-regulatory tools) and expectations (i.e., homework) for meeting the group goal (i.e., adding an extra day of LTPA) were assessed on an individual and group level.

The assessment following session 1 consisted of five items, three of which were based on an individual level and two on a group level (modified versions from Brawley et al., 2013;). The three individual level items assessed participants’ perceived level of: 1) ease in understanding the session content; 2) usefulness of the assigned homework; and 3) satisfaction with the session
content. A sample question is, “The assigned homework will be useful for increasing my understanding of the importance of adding an extra day of leisure-time physical activity into my schedule.” The two group level items assessed how the group discussions made a personal impact on: 1) contemplating the benefits of achieving the group goal; and 2) motivating oneself to meet the group goal. A sample question is, “The group discussions have inspired me to start thinking about the benefits of adding an extra day of LTPA into my schedule.” Each of the five items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The assessment following session 4 consisted of seven items assessing individual and group level perceptions of the program lessons overall. The six individual level items assessed participants’ perceived level of: 1) usefulness of the self-monitoring strategy learned; 2) usefulness of the goal-setting strategy learned; 3) usefulness of the problem-solving strategy learned; 4) ease in understanding the program content; 5) usefulness of the assigned homework; and 6) satisfaction with the program content. A sample question within these individual level items is, “I found the self-monitoring strategy to be useful for adding an extra day of leisure-time physical activity into my schedule.” The group level item assessed how each of the group discussions made a personal impact on understanding the importance of using the self-regulatory strategies to achieve the group goal: “My involvement in the group discussions has helped me understand the importance of using the strategies taught for planning an extra day of leisure-time physical activity into my schedule.” Each of the seven items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Analyses of internal consistency for the original five items at the Session1 time-point suggested concerns with two of the items. One item (“I found the information presented in the session to be easy to understand”) had zero variance; therefore, it was removed from the scale. Cronbach’s alpha for the session 1 scale was .57 (n = 4 items). Furthermore, another item (“My involvement in the group discussions has motivated me to add an extra day of leisure-time physical activity into my schedule.”) was not correlated with the total score; therefore, upon removal of the item,
the adjusted Cronbach’s alpha for this scale increased to .74 at the session 1 time-point. Mean scores were then calculated across each of the session’s respective number of items (session 1 [3 items] and session 4 [7 items]). In regards to the Session 4 time-point, Cronbach’s alpha was .78 with all items shown as correlated with the total score.

**Perceptions of the group environment** (see Appendix H). Two scales were administered after sessions 1 and 4 to assess two aspects of the group environment of the e-SMART program: 1) Usefulness of the group; and 2) Usefulness of the group facilitator.

**Perceived usefulness of the group** (i.e., group integration or cohesion [Carron, Brawley & Widmeyer, 2002]) was assessed according to a modified version of a 7-item group cohesion instrument previously used in LTPA behaviour change research, which examined the role of group cohesion in the development of group mediation (e.g., Brawley et al., 2013; Cramp & Brawley, 2009). The current 5-item instrument was adapted from Brawley and colleagues’ (2013) group cohesion instrument and primarily assessed how the group discussions empowered the group to meet the group goal. Two items (“Our Ramp-Up group has helped identify and understand common barriers to exercise we all face.”, “Our Ramp-Up group discussions about being physically active are providing all of us with a better understanding than just reading about it.”) from this specific instrument used by Brawley and colleagues (2013) were excluded for the purpose of maintaining conciseness and relevance for the current online program. Each of the five items were assessed using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher ratings representing more positive perceptions regarding the contributions of the group on the participants’ learning experience. A sample question on this scale includes, “My group helps motivate each of us to make extra leisure-time physical activity a part of our weekly routine” (Brawley et al., 2013). Mean scores were calculated separately for the two assessment periods (i.e., post-sessions 1 and 4). Cronbach’s alpha for the scale was .88 at both time points.

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1 The Cronbach’s alpha and total calculated mean score for the Usefulness of the Program Content instrument (Session 1 time-point; 5 items) was .57 and M = 3.78 (0.31), respectively.
Perceived usefulness of the group facilitator was assessed according to a modified version of the 6-item interventionist collaboration instrument previously used in the GMCB pilot intervention for LTPA actors with SCI (Brawley et al., 2013). Brawley and colleagues (2013) justified the use of this instrument due to previous research showing that the level of collaboration between the facilitator and participant is a representation of program fidelity (Cramp & Brawley, 2009), as well as participant engagement and adherence with the program assignments (Meichenbaum & Turk, 1987). The current 5-item instrument is a modified version of Brawley and colleagues’ (2013) scale, whereby one item (“Because of the RAMP-UP discussions with our leader, I feel I have learned some skills that will help me maintain my extra day of physical activity in future weeks”) was excluded to focus primarily on group collaboration outcomes. Based on the instrument used by Brawley and colleagues (2013), each of the five items on this scale were assessed using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher ratings representing more positive perceptions of the efforts of the group facilitator on managing the e-SMART sessions and building the group’s motivation for engaging in LTPA. A sample question on this scale includes, “I feel my group facilitator has worked together with us in building a program plan that will help meet each of our specific physical activity needs and goals.” Mean scores were calculated separately for the two assessment periods (i.e., post-sessions 1 and 4). Cronbach’s alpha for the scale was .63 at session 1 and .84 at session 4.

Baseline and post-program assessments. The following outcomes were assessed at baseline (immediately following the telephone screening; see Appendix F), and post-program (24 hours following the completion of the session 4 assessment survey; see Appendix J).

LTPA behaviour. A portion of the 7-day self-report leisure-time physical activity questionnaire for adults with SCI (LTPAQ-SCI; Martin Ginis, Phang, Latimer & Arbour-Nicitopoulos, 2012) was utilized to assess: 1) the frequency of mild and moderate-to-heavy intensity aerobic LTPA over the past 7 days; and 2) the frequency of mild and moderate-to-heavy intensity strength-training LTPA over the past 7 days. Given that the e-SMART program’s objective was to promote an additional 20-minute bout of moderate-heavy intensity
LTPA, these two items were slightly modified from the original LTPAQ-SCI by having participants specify the duration of each bout of LTPA as 20-minutes minimum. Although the focus of the e-SMART program was promoting moderate-to-heavy intensity LTPA, mild intensity was included to prevent the over-reporting of moderate-heavy intensity LTPA (Martin Ginis, Phang, Latimer & Arbour-Nicitopoulos, 2012). Based on previous research using the LTPAQ-SCI (Martin Ginis et al., 2012), mild intensity LTPA was defined in the current assessments as very light physical effort that can be maintained for a long time without fatigue; whereas moderate-to-heavy intensity LTPA was defined as greater physical effort than mild intensity LTPA but can either be maintained for a while without fatigue (moderate intensity) or for only a short period of time before fatigue sets in (heavy intensity). Frequency data was collected according to the number of days participants reported engaging in aerobic LTPA at a mild and moderate-to-heavy intensity and strengthening LTPA at a mild and moderate-to-heavy intensity over the previous 7 days.

**LTPA intentions.** Intentions to add an additional bout of moderate-to-heavy intensity LTPA per week was assessed using a single item, rated using a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*): “In the next 4 weeks, I intend on adding one extra bout of moderate-heavy intensity exercise (aerobic or strength-training) for at least 20 minutes to my weekly routine.” This item is a modified version of a previously used scale (1 [definitely false/extremely unlikely] to 7 [definitely true/extremely likely]) for the SCI population (Arbour-Nicitopoulos, Martin Ginis & Latimer, 2009; Latimer, Martin Ginis & Arbour, 2006; Latimer & Martin Ginis, 2005): “I intend to do at least 30 min of moderate to heavy physical activity 3 days per week over the next four weeks.”

**Videoconference intentions.** Intentions to participate in videoconferencing were assessed using two items, each of which were rated using a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The two items were preceded by the statement, “In the future I intend on...” and followed by, “...using videoconference to communicate with friends, family and other social networks” [personal reasons], and “...participating in other self-
management group support programs delivered through videoconference” [educational reasons].

Videoconference outcome expectancies. Participants’ affective outcome expectancies for participating in the e-SMART videoconference platform were assessed using six adjective pairs (i.e., unenjoyable-enjoyable, harmful-beneficial, unpleasant-pleasant, bad-good, stressful-relaxing, useless-useful) that are frequently used to assess affective outcome expectancies (Ajzen, 2002). Each adjective pair was preceded by the statement, “To what extent do you think communication with others via videoconference would be...” These pairs were rated on a 7-point Likert scale ranging from, using the term ‘extremely’ at the anchors. A total mean score was calculated for each time-point. Cronbach’s alpha for the scale was calculated at both the baseline (α = .87) and program follow-up (α = .89) time-points.

Videoconference self-efficacy. Two types of self-efficacy pertaining to the use of the Skype® videoconference platform were assessed at baseline and program follow: 1) general task self-efficacy; and 2) barrier self-efficacy.

Videoconference task self-efficacy, defined as the confidence to use a videoconference platform, was assessed using a single item and rated using a 7-point Likert scale ranging from 1 (not confident at all) to 7 (completely confident): “Over the next 4 weeks, if you had all of the resources you needed, such as specialized equipment or an assistant, how confident are you that you could communicate with others via videoconference?”). This item is a shortened version of the 20-item task self-efficacy instrument previously used in SCI research assessing confidence in performing a specific mode, intensity and duration of LTPA (e.g., moderate intensity aerobic activity for 10 minutes; Martin Ginis et al., 2013). The level of confidence in being able to perform a task has been related to behaviour initiation and maintenance (Bandura, 1997).

Videoconference barrier self-efficacy, defined as the confidence to overcome technical videoconference-related barriers (i.e., Internet connection, audio or visual connection, Karabulut & Correia, 2008) was assessed using two items, both of which were rated on 7-point Likert scale ranging from 1 (not confident at all) to 7 (completely confident). Both items were preceded by
the statement, “Assuming you were very motivated to communicate with others via videoconference, how confident are you that you could solve technical difficulties (e.g., Internet connection, audio or visual connection)...” (Blanchard et al., 2003; Martin Ginis et al., 2013). The two items that followed this statement were related to the way that barriers could be potentially solved: 1) independently; and 2) with the support from someone else.

**Post-testing program evaluation.** The post-testing questionnaire (Appendix J) concluded with a set of program evaluation questions to gain participant feedback on the participants’ educational and social experiences from participating in the e-SMART program. The questions included within this feedback questionnaire were systematically organized to assess aspects related to the feasibility, acceptability and usefulness of the e-SMART program.

Program feasibility was assessed in three areas (c.f., Bowen et al., 2010): time (4 items), space (3 items), and learning strategies (6 items). Based on Bowen et al.’s recommendations, this program feasibility assessment focused on participants’ perceptions of the practicality and adaptation of an LTPA peer support program in a videoconference setting. Specifically, the intention was to gain feedback on how the mediated platform (i.e., Skype®) and the supplemental features (i.e., one-on-one videoconference tutorial, screen sharing and the buddy system) were compatible with the time constraints and virtual environment to support communication, engagement and learning. Examples of some of the items that were used to assess these three aspects of feasibility include, “I had enough time to practice the physical activity strategies (e.g., self-monitoring and goal-setting),” [time], “I was able to recognize my peer’s nonverbal cues (i.e., facial expressions, eye contact, body posture, and tone of voice) during the group sessions” [space], and “The one-on-one videoconference tutorial and manual were very useful” [learning strategies]. All items were rated using 5-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). In the case that an item was not perceived by a participant to be applicable to their experience in the e-SMART program (e.g., learning strategies), there was an option to select “Not Applicable.” Mean scores were calculated across each of the three areas of feasibility assessment. Cronbach’s alpha for each of the three feasibility scales were .73 [time], .59 [space], and .85 [learn strategies]. In regards to the
assessment of *Time*, one item (“*I had enough time to familiarize myself with the videoconference platform.*”) was not correlated with the total score; upon removal of the item, the adjusted Cronbach’s alpha for this scale increased to .82.²

Given that perceived level of enjoyment is expected to inform the likelihood of continued use of the videoconference platform (Gaines, Shaw & Chen, 2002), program *acceptability* was examined according to participants’ level of enjoyment in being a e-SMART group member. A total of three items were used for this scale, all of which were rated on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item was, “*Overall, I enjoyed participating in the group discussions and activities.*” Cronbach’s alpha for the scale was .76.

Meanwhile, usefulness of the e-SMART program was evaluated based on recommendations within the Internet-user satisfaction literature suggesting that user satisfaction relates to both the operating functions (usability) and overall virtual experience (utility) of a user interface (Nielsen, 2012; Shackel, 2009; and Gaines, Shaw & Chen, 2002). Nielsen (2012). As such, both the perceived usability and utility of the videoconference platform to deliver the e-SMART program were evaluated in this section of the post-testing questionnaire.

Usability was evaluated based on participants’ ‘perceived ease of using’ the Skype® videoconference functions and overall ‘user satisfaction’. Seven items were included within the ‘perceived ease of use’ scale, all of which were rated on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). A sample item on this scale was, “*It was easy and quick to learn how to operate the videoconference platform.*” Meanwhile, six items were included within the ‘user satisfaction’ scale; five of these items were rated on a 5-point Likert scale, ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*), while the sixth item pertaining to perceived similarities or differences between face-to-face and group interaction was rated on a scale ranging from 1 (*very similar*) to 5 (*very different*). A sample item on this scale was, “*To what extent do you feel satisfied with the self-monitoring lesson?*”

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² The Cronbach’s alpha and total calculated mean score for Time (Feasibility assessment; 4 items) was .731 and M = 4.25 (0.68), respectively.
Utility was evaluated based on participant’s views towards the e-SMART program’s ability (i.e., functionality) to sufficiently provide the tools necessary to meet their task (i.e., LTPA self-regulatory skills), social (i.e., group cohesion) and technical (i.e., troubleshooting) needs. As such, five items assessing functionality (e.g., “To what extent has the program taught you the skills necessary to operate a videoconference platform?” and “To what extent did the program help you meet your physical activity goals?”) were included in the program follow-up questionnaire. All items were rated using 5-point Likert scales, ranging from 1 (not at all) to 5 (a very great extent).

Separate mean usefulness scores were calculated for each of the usability and utility subscales, with higher scores representing more favourable perceptions towards the usefulness of the videoconference platform. Cronbach’s alpha for each of the usefulness subscales were .86 [perceived ease of use], .91 [user satisfaction], and .74 [functionality].

3.3.5 Protocol

Refer to Figure 2 for an overview of the Study 2 protocol.

**Baseline assessment.** Participants completed a baseline online questionnaire following telephone screening. The purpose of this questionnaire was to obtain consent from participants regarding: 1) program expectations (i.e., completion of skills exercise training [homework] and post-session surveys); 2) the buddy system (peer-to-peer communication between each of the four e-SMART program sessions); and 3) completion of the online study assessments.

**Videoconference tutorial.** At the time of enrolment, a mandatory, one-on-one 20-minute interactive Skype® tutorial with the e-SMART group facilitator (S.J.) was scheduled. Participants were each emailed a Skype® navigation guide (included within the Participant Activity manual; see Appendix L) upon enrolment. The purpose of the Skype® instruction guide within the e-SMART participant activity manual was to provide participants the opportunity to review how to operate the Skype® platform prior to the one-on-one videoconference tutorial.
During the interactive Skype® tutorial, each participant was asked to complete several Skype® functions with the facilitator to prepare them for participating in the e-SMART program. If necessary, the group facilitator instructed and provided a demonstration on how to navigate through the Skype® platform by sharing her computer screen display with the participant. The key functions that participants were taught during this tutorial session were: 1) accepting and ending a Skype® call; 2) accepting a Skype® contact request; 3) testing the webcam and microphone settings; 4) screen sharing; 5) sharing files; and 6) instant messaging.

The e-SMART program. A total of four, 60-minute weekly lesson plans were developed and implemented by the student investigator. All participants were provided with an electronic copy of the e-SMART program manual (see Appendix L) that consisted of the following: (1) a Skype® navigation guide; (2) an outline of the videoconference ground rules (‘netiquette’), (3) the session objectives; and (4) the LTPA self-regulatory skill building activities (i.e., self-monitoring, goal-setting, and problem-solving). Each of the four weekly sessions focused on promoting peer engagement and discussion for the purposes of sharing experiential knowledge. This supportive, group-motivated environment was fostered through the development of group identity and collaboration in a virtual setting (Cartwright, 1972; McKenna & Green, 2002; Nazzaro & Strazzabosco, 2009). Examples of the group collaborative activities that were carried out in the e-SMART program include: (i) private discussions (where the facilitator muted her speakers and microphone) to allow for brief small group discussion of homework, (ii) Go-Rounds to encourage input from the entire group (organized alphabetically by first name), and (iii) Brainstorming via instant messaging on Skype®. If any technical difficulties arose, the first point of contact was through the group facilitator (S.J.), followed by peers (verbally or via instant message). If necessary, the research assistant communicated with the participant who required troubleshooting assistance via email. In addition to providing suggestions for troubleshooting via email (e.g., restarting the computer, closing other documents and programs), the research assistant continuously monitored the session guide (see Appendix M) and completed the session implementation checklist (see Appendix I). This checklist consisted of all outcomes included within Table 9. The research assistant also took brief notes on the context of the group collaboration (i.e., social norms expressed [i.e., commonalities and
differences]) and troubleshooting (i.e., peer support source). One research assistant (G.N.) was assigned group 1 and sessions 3 and 4 for group 2. Due to a time conflict for the research assistant, the second research assistant (R.S.) monitored sessions 1 and 2 for group 2. Following each session, all participants were administered via an email link questionnaires pertaining to the quality of the Skype® sessions, as well as the perceived usefulness of the group (i.e., cohesion) and perceived usefulness of the group facilitator (sessions 1 and 4 only). The program follow-up assessment was administered online, 24 hours following the completion of the session 4 assessment, to evaluate outcomes related to the feasibility, acceptability and usefulness of the e-SMART program; the LTPA behaviour and intentions; and videoconference social cognitions items were also administered at this time.

Upon completion of each of the surveys, participants received an electronic Starbucks gift card as compensation for their time ($5 for each post-session survey [sessions 1, 2, 3, 4] and $10 for the program-follow up survey).
3.3.6 Videoconferencing software

Skype® is an Internet-based, Voice over Internet Protocol (VoIP) desktop and mobile/tablet videoconferencing software that allows for two-way and group communication via audio, video and/or text communication in real-time. All conversation members must have the free software downloaded on their computer. In group conversations, only the initiator of the call must have the entire group added to their contact list. Since becoming publically available in 2003, Skype® has accumulated more than 370 million registered users globally (Gibson et al., 2010), and is compatible with Windows and Macintosh computer operating systems. Video resolution can offer up to 320 x 240 pixels at 15 frames per second (fps) and video transmission speeds can offer 640 x 480 pixels at up to 30 fps (Gibson et al., 2010). Audio-only Skype® calls require a connection speed of 10-64 kilo bits per second (kbps), whereas video calls require 384 kbps (Gibson et al., 2010). However, there are various technical factors that can influence the quality of audio and/or video transmission. Internet bandwidth, or the speed at which information is transferred between videoconference users, has a large impact on video and audio quality. There are two types of bandwidth: downstream and upstream. On the receiver’s end, downstream bandwidth controls the amount of video data that is accessible via the Internet across a unit of time, bits per second [bps] (Gibson et al., 2010). Meanwhile, upstream bandwidth, or the speed at which outgoing information is transmitted from the sender, plays a larger role in video and audio transmission quality for the receiver, regardless of their downstream bandwidth connection (Gibson et al., 2010). Furthermore, the speed at which audio and video data is received once officially sent (i.e., latency) can be altered by network traffic (Gibson et al., 2010). The recommended processor speed is a minimum of 1 GHz processor and 256 MB RAM for Windows-based systems and 800 MHz processor and 512 MB RAM for Mac-based systems (Gibson et al., 2010). Web cam and speakers can also have a large effect on audio and video quality. It is recommended to use headphones to prevent echo, especially with older equipment systems that may be sensitive to external noise (Gibson et al., 2010). For privacy and security purposes, all transmitted data through Skype® is encrypted using an advanced standard called Rijndael to prevent intercepted data being decoded (Gibson et al., 2010).
In the current study, each participant was provided with the option to accept or reject a Skype® call invite or end a conversation at any point in time. The group facilitator invited each participant into the four group Skype® session calls.

3.3.7 Data analysis

Descriptive statistics (means, standard deviations, and frequencies) were calculated for all measures that were related to the three primary outcomes of the e-SMART program’s feasibility (Research Question #1), acceptability (Research Question #2) and utility (Research Question #3). Paired samples t-tests were used to examine pre- and post- program changes in the social cognitions and LTPA behaviour scales, as well as changes in session 1 and 4 feedback assessments (i.e., Skype® quality feedback questionnaire and the group development check). Hedges’ g effect sizes were calculated with positive values representing a favourable effect (Durlak, 2009). This statistical technique accounts for small sample sizes by correcting for positive biases in effect sizes through the pooling of the sample size weighted standard deviations within each comparison group (Durlak, 2009; Ellis, P.D, 2009). The magnitude of the effects size is interpreted as small (0.20), medium (0.50) and large (0.80) (Cohen, 1992).

3.4 Results

3.4.1 Participant characteristics

Table 10 provides the mean scores and frequencies for all measured participant characteristics for the entire sample (N = 9) and for each of the two e-SMART groups. The sample primarily consisted of men (88.9%) and middle-aged individuals (M = 42.89 years ± 10.35 years). The median age and number of years since participants’ SCI incident was larger in Group 1 (54 years old [IQR = 33.0-56.50] and 26 years since SCI [IQR = 8.00-36.00]) compared to Group 2 (38 years old [IQR = 35.50-41.25] and 17.5 years since SCI [IQR = 12.50-30.75]). The majority of participants in both groups had an injury classified as tetraplegia (77.8%), while more participants in Group 1 primarily used a power wheelchair (60%) versus those in Group 2 (25%). Marital status differed between groups. More participants in Group 1 were married or in a common-law relationship; whereas all Group 2 members were single. In regards to
geographical location, most participants were within the Eastern Time Zone (77.8%) and reported living in an urban environment (66.7%). Two participants from Group 1 were from the Pacific Time Zone.

All participants who reported engaging in MVPA (44.4%) were meeting the recommended number of days per week of aerobic and strength training activities outlined in the PAG-SCI (Martin Ginis, Hicks, et al., 2011), with each group consisting of two participants who were classified as LTPA actors.
Table 10.

*Characteristics of the Participants Enrolled in the e-SMART Program (N = 9)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (N = 9)</th>
<th>Group 1 (n = 5)</th>
<th>Group 2 (n = 4)</th>
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</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
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<tr>
<td>( M \pm SD )</td>
<td>42.89 ± 10.35</td>
<td>46.60 ± 12.99</td>
<td>38.25 ± 2.99</td>
</tr>
<tr>
<td>Median</td>
<td>39.0</td>
<td>54.0</td>
<td>38.0</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>36.0-54.50</td>
<td>33.0-56.50</td>
<td>35.50-41.25</td>
</tr>
<tr>
<td><strong>Gender, n (%)</strong></td>
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</tr>
<tr>
<td>Female</td>
<td>1 (11.1)</td>
<td>1 (20.0)</td>
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</tr>
<tr>
<td>Male</td>
<td>8 (88.9)</td>
<td>4 (80.0)</td>
<td>4 (100.0)</td>
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<tr>
<td><strong>Years post-injury</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean ± SD</td>
<td>21.67 ± 12.40</td>
<td>22.80 ± 14.97</td>
<td>20.25 ± 10.31</td>
</tr>
<tr>
<td>Median</td>
<td>18.0</td>
<td>26.0</td>
<td>17.5</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>10.00-32.00</td>
<td>8.00-36.00</td>
<td>12.50-30.75</td>
</tr>
<tr>
<td><strong>Injury level, n (%)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tetraplegia</td>
<td>7 (77.8)</td>
<td>4 (80.0)</td>
<td>3 (75.0)</td>
</tr>
<tr>
<td>Paraplegia</td>
<td>2 (22.2)</td>
<td>1 (20.0)</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td><strong>Injury severity, n (%)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>4 (44.4)</td>
<td>3 (60.0)</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td>Incomplete</td>
<td>4 (44.4)</td>
<td>2 (40.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Other*</td>
<td>1 (11.1)</td>
<td>--</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td><strong>Injury cause, n (%)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Motor vehicle accident</td>
<td>6 (66.7)</td>
<td>5 (100.0)</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td>Recreation</td>
<td>2 (22.2)</td>
<td>--</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (11.1)</td>
<td>--</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td><strong>Primary mode of mobility, n (%)</strong></td>
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<td></td>
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<tr>
<td>Manual wheelchair</td>
<td>4 (44.4)</td>
<td>2 (40.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Power wheelchair</td>
<td>4 (44.4)</td>
<td>3 (60.0)</td>
<td>1 (25.0)</td>
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<tr>
<td>Other**</td>
<td>1 (11.1)</td>
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<td>1 (25.0)</td>
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<tr>
<td><strong>Highest level of education, n (%)</strong></td>
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<tr>
<td>High school</td>
<td>2 (22.2)</td>
<td>1 (20.0)</td>
<td>1 (25.0)</td>
</tr>
<tr>
<td>Post-secondary</td>
<td>7 (77.7)</td>
<td>4 (80.0)</td>
<td>3 (75.0)</td>
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<tr>
<td>Ethnicity, n (%)</td>
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</tr>
<tr>
<td>White</td>
<td>4 (44.4)</td>
<td>2 (40.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (55.5)</td>
<td>3 (60.0)</td>
<td>2 (50.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status, n (%)</th>
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<tbody>
<tr>
<td>Single</td>
<td>5 (55.6)</td>
<td>1 (20.0)</td>
<td>4 (100.0)</td>
</tr>
<tr>
<td>Common law/ Married</td>
<td>4 (44.4)</td>
<td>4 (80.0)</td>
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</table>

<table>
<thead>
<tr>
<th>Time zone, n (%)</th>
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</thead>
<tbody>
<tr>
<td>Pacific</td>
<td>2 (22.2)</td>
<td>2 (40.0)</td>
<td>--</td>
</tr>
<tr>
<td>Eastern</td>
<td>7 (77.8)</td>
<td>3 (60.0)</td>
<td>4 (100.0)</td>
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</table>

<table>
<thead>
<tr>
<th>Built environment, n (%)</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Rural</td>
<td>3 (33.3)</td>
<td>1 (20.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Urban</td>
<td>6 (66.7)</td>
<td>4 (80.0)</td>
<td>2 (50.0)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Mode of Internet connection, n (%)</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Cable modem</td>
<td>4 (44.4)</td>
<td>2 (40.0)</td>
<td>2 (50.0)</td>
</tr>
<tr>
<td>Digital Subscriber Line (DSL)</td>
<td>2 (22.2)</td>
<td>2 (40.0)</td>
<td>--</td>
</tr>
<tr>
<td>Wireless</td>
<td>3 (33.3)</td>
<td>1 (20.0)</td>
<td>2 (50.0)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer operating system, n (%)</th>
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</thead>
<tbody>
<tr>
<td>MacIntosh</td>
<td>1 (11.1)</td>
<td>1 (20.0)</td>
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</tr>
<tr>
<td>Windows</td>
<td>8 (88.9)</td>
<td>4 (80.0)</td>
<td>4 (100.0)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Meeting the PAGs (days/wk), n (%)</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>4 (44.4)</td>
<td>2 (40.0)</td>
<td>2 (50.0)</td>
</tr>
</tbody>
</table>

*Note. M = mean; SD = standard deviation.*

*Other category for non-traumatic SCI: Spina bifida; Tetraplegia (C1-C8) and Paraplegia (T1 and below).*

**Other category for primary mode of mobility: manual wheelchair with power-assisted wheels.
3.4.2 Program feasibility

**Objective measures.** A comparison between the observed implementation of the four Skype® group calls and the expected values for implementation of these group sessions are presented in Table 11 and within the e-SMART group facilitator session guide (see Appendix M). The Skype® sessions were on average 19.6 minutes longer than the expected duration (i.e., mean total duration of each sessions was 79.6 minutes versus the expected 60-minute session duration). When examining the differences in the total session duration between the two groups, a progressive increase in the session duration for both groups was observed over the course of the four e-SMART sessions; this increase was exhibited to be greater for Group 2 (e.g., session 1 = 60 minutes, session 4 = 112 minutes) versus Group 1 (session 1 = 74 minutes, session 4 = 73 minutes; Table 11). Figure 3 depicts the expected and observed cumulative duration trends, overall, and per group for each of the sessions. Most of the sections were implemented (e.g., homework discussions and self-regulation lessons), but deviated from the planned duration as set out in the session guide. However, Group 1 did not require the additional group Skype® navigation activity that was planned for session 1. As the sessions progressed, the duration of the sessions surpassed the intended 60-minute session duration ($M = 19.63 \pm 16.46$ minutes over the intended duration). Furthermore, the program delivery quality, in regards to the number of uninterrupted virtual discussions, appeared to improve over time for both groups as observed through the decrease in participant interjections and external interruptions from session 1 to 4 (Table 11).
Figure 3. Comparison between expected and actual mean duration of the planned e-SMART session sections overall and by group.
**Self-report measures.** Table 11 provides the results of the self-report feasibility measures that were evaluated at the program follow-up assessment. Overall, participants responded favourably to these questions (i.e., all mean scores ≥ 3.70 on the 5-point scales), indicating that participants positively perceived the use of time, space and learning strategies for delivering the e-SMART program via Skype®.
Table 11.

Mean (SD) Scores, t-Statistics, and Effect Sizes (Hedges g) of Measures Outcomes (N = 9)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th>Weekly assessments</th>
<th>Program Follow-Up</th>
<th>t-statistic*</th>
<th>Hedges g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility/Fidelity</td>
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<tr>
<td>Dosage (session minutes)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>--</td>
<td>74</td>
<td>71</td>
<td>71</td>
<td>73</td>
</tr>
<tr>
<td>G2</td>
<td>--</td>
<td>60</td>
<td>81</td>
<td>95</td>
<td>112</td>
</tr>
<tr>
<td>Section adherence (%)</td>
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<td>(%)^4</td>
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<tr>
<td>G1</td>
<td>--</td>
<td>85.7</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>G2</td>
<td>--</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Delivery quality (# interruptions)</td>
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<td></td>
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<tr>
<td>G1</td>
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<td>11</td>
<td>3</td>
<td>4</td>
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<td>G2</td>
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<td>Time^1</td>
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<td>Learning strategies</td>
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<td>Acceptability</td>
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<tr>
<td>Attendance (# participants)</td>
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</tr>
<tr>
<td>G1</td>
<td>--</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
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<tr>
<td>G2</td>
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<td>Buddy system (#)</td>
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<td></td>
<td>G1</td>
<td>G2</td>
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<td>Perceived level of</td>
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<td>Usefulness</td>
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<td>G1</td>
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<td>4.35 ± .61</td>
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<td>4.43 ± .51</td>
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<td>G2</td>
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<td>3.74 ± .49</td>
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<td>4.13 ± .39</td>
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<td>G1</td>
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<td>3.58 ± .64</td>
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<td>4.23 ± .51</td>
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<td>G2</td>
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<td>4.02 ± .46</td>
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<td>Moderate-vigorous</td>
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<td>Social cognitions</td>
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<td>Aerobic (days/week)</td>
<td>1.67 ± 2.40</td>
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<td>Strength (days/week)</td>
<td>1.22 ± 1.48</td>
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<td>Social cognitions</td>
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<td>LTPA intention</td>
<td>4.44 ± 2.13</td>
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<td>V/C intentions</td>
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| Family and friends             | 4.78 ± 1.30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.56 ± .73 | - 4.88 | -1.61
| Self-management program        | 4.22 ± 1.56 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.22 ± 1.48 | - 1.66 | -.63
| V/C outcome expectancies       | 5.04 ± .96 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.65 ± .77 | -2.18 | -.67 |
| V/C task self-efficacy         | 5.67 ± 1.32 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.44 ± .73 | -2.14 | -.69 |
| V/C barrier self-efficacy      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Independent troubleshooting    | 4.89 ± 2.20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.00 ± .87 | -1.75 | -.63 |
| Troubleshooting support        | 6.11 ± 1.05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.44 ± .88 | -.707 | -.32 |

*Change from session 1 to session 4.
**There were no paired buddy interactions reported during the 4-week period.
1exclude item #1.
2large effect size.
3medium effect size.
4percentage of sections completed: session 1 (7 sections) and sessions 2-4 (4 sections).
3.4.3 Program acceptability

**Objective measures.** Table 11 presents data on observations of acceptability (i.e., participant session attendance and buddy system participation) over the four weekly e-SMART program sessions and between the two groups. Overall, the participants in the e-SMART program attended 91.7% of the sessions; and attendance for Groups 1 and 2 were 90% and 93.8%, respectively. All participants opted to use the video function of Skype®. The buddy system component of the e-SMART program was initiated following session 2 by Group 1 and consisted of group emails that included all members of the group (see Table 11). This form of buddy system communication (i.e., group emails) was also initiated by participants in group 2 following the third session.

**Self-report measures.** The total mean score for perceived level of enjoyment at the program follow-up assessment was rated positively ($M = 4.37 \pm 0.65$ out of 5), indicating that the overall e-SMART program, and specifically, involvement in the one-on-one group discussions and activities were perceived as entertaining and worthwhile.


3.4.4 Program usefulness

**Objective measures.** With respect to the usability of the e-SMART program, minimal technical difficulties were experienced throughout the 4-week study period for either group. Across the groups, there were a total of 10 cases of technical difficulties, occurring mostly during the first and final session for Group 2. All technical issues, except for one pertaining to video quality during session 4, were resolved. The unresolved video quality issue was managed by using audio only and instant messaging via Skype® for communication with the group for approximately 50% of the session. The remaining troubleshooting instances ranged between 3 to 10 minutes in duration. Figure 4 depicts the frequency of support from specific sources (e.g., peer). Initially, most technical difficulties were resolved independently. In sessions 3 and 4, troubleshooting support was relied on from other peer members, the group facilitator and the research assistant.

In terms of the utility assessments, changes in frequencies of sharing (i.e., experiences, opinions and problem solving strategies) over time differed between groups (see Figures 5 and 6). Participant engagement and sharing in Group 1 was most frequent during sessions 1 and 4, whereas sharing progressively increased over time in Group 2. Expressions of normative beliefs were shown to be most frequent in session 4 for both groups. As shown in Figure 7, there was an observed change in frequency between participant commonalities and differences as the e-SMART program progressed over the four weeks. Participant differences were more frequently expressed over time and further exceeded the number of commonalities expressed within the groups by session 4. As depicted in Figures 5 and 6, the usage of Skype® collaborative functions (i.e., screen sharing and instant messaging) differed between groups, indicating larger counts for Group 1 across the four sessions ($M = 11.75 \pm 5.85$) than participants in Group 2 ($M = 10.25 \pm 6.08$). However, there was an observed 1.51 mean (SD= 0.78) increase in Skype® collaborative function count as the sessions progressed for Group 2, in contrast to a 0.83 mean (SD = 0.73) decrease for Group 1.
Figure 4. Frequency of troubleshooting support sources peer session, including group comparisons.
Self-report measures. In terms of the usability subscales (see Table 11), positive ratings on the ease of operating the Skype® functions (e.g., screen sharing) were reported, overall, by participants after Session 1 (M = 4.35 ± 0.61) and Session 4 (M = 4.45 ± 0.71) assessments; with a small, non-significant effect for change over time (g = -.14).

Furthermore, the overall perceptions of the usability of the e-SMART program were rated positively at the program follow-up assessment, according to perceived ease of using the Skype® platform (M = 4.68 ± 0.42 out of 5), program functionality (M = 3.76 ± 0.68 out of 5), and overall user satisfaction with the accomplished learning objectives (M = 4.02 ± 0.67 out of 5).

With respect to the utility subscales, an increase in positive ratings with a significant large sized effect for time was found for two of the group dynamic measures from Session 1 to 4: group cohesion (M₁ = 3.58 ± 0.64 out of 5; M₄ = 4.23 ± 0.51 out of 5; t = -4.33, p ≤ .01, g = -1.06) and facilitator collaboration (M₁ = 4.02 ± 0.46 out of 5; M₄ = 4.55 ± 0.37 out of 5; t = -3.38, p ≤ .01, g = -1.20) (see Table 11). These two positive outcomes demonstrated that peers and the facilitator were perceived as influential towards the group effort of accomplishing the e-SMART learning objectives and the LTPA goal established by the group. Additionally, participants reported at program follow-up higher ratings for perceived usefulness of program content throughout the entire e-SMART program (M = 4.13 ± 0.39 out of 5) compared to perceived usefulness of the content following session 1 (M = 3.74 ± 0.49 out of 5), indicating that increasing efforts were made by the group to help support learning of the self-management strategies as the program progressed.
Figure 5. Trends across the 4-week e-SMART program in the frequency of observed key indicators of group collaboration (Group 1).

Figure 6. Trends across 4-week e-SMART program in the frequency of observed key indicators of group collaboration (Group 2).
Figure 7. Overall and group-specific trends in the frequency of commonalities and differences expressed across the four sessions.
3.4.5 Secondary outcomes

**Videoconference social cognitions and LTPA behaviour.** Table 11 outlines all of the descriptive statistics, $t$ statistics and effect sizes for the following outcomes. Paired samples $t$-tests showed a significant large effect for time (Session 1 to 4) regarding intentions to participate in a videoconference communication platform for personal reasons ($M_1 = 4.78 \pm 1.30$ out of 7, $M_4 = 6.56 \pm 0.73$ out of 7; $t = -4.88, g = -1.61$), and a non-significant moderate-sized effect for educational reasons ($g = -.63$; see Table 11). There was a non-significant, small-to-moderate sized effect for changes in expected affective response from videoconference use (i.e., outcome expectancies; $g = -.67$) and perceived ability to participate in videoconference platform (i.e., task self-efficacy; $g = -.69$). With regards to videoconference-related barrier self-efficacy, there was also a non-significant, small-to-moderate sized effect for time (Sessions 1 to 4) for independent troubleshooting ($g = -.63$) and gaining troubleshooting support from others ($g = -.32$).

LTPA-related intentions ($g = -.15$) and behaviour (i.e., number of days of aerobic MVPA [$g = .00$] and strength-training MVPA [$g = -.37$]) did not significantly change from baseline to program follow-up (Table 11).
Chapter 4

4 General discussion

The overall purpose of this thesis was to determine the appropriateness of using a real-time, virtual medium for delivering LTPA-enhancing interventions to LTPA intenders and actors with SCI. This was done using a two-step approach. In Study 1, the receptivity towards using a videoconference platform was examined among 30 LTPA intenders and actors with SCI, while Study 2 involved a pilot evaluation of a Skype®-delivered peer support program (Study 2) among nine LTPA intenders and actors with SCI. The key findings from both of these studies will be discussed in the following sections, along with the studies’ contributions to the field of videoconference-delivered LTPA interventions and future research directions.

4.1 Study 1 main findings

The results from Study 1 indicated that half of the survey respondents have used a videoconferencing platform in the past and that the majority (60%) of the respondents were receptive towards the proposed videoconference-delivered LTPA peer support program (e-SMART; Study 2). Furthermore, the survey responses showed that LTPA participation levels (i.e., the extent to which participants were meeting the PAG-SCI) and demographic characteristics (e.g., age) characterize the level of receptivity towards the use of ICPs for gaining LTPA-related support. For example, survey respondents who were not meeting the aerobic or strength-training guidelines reported more frequent use of several types of ICPs (i.e., email messaging, instant messaging and discussion boards), as well as the need for LTPA-related informational support (i.e., strategies for overcoming barriers and self-monitoring) via ICPs. This aligns with previous SCI-related research examining perceived views towards self-management support services, indicating Internet-delivered support to be a highly favoured support service within the Canadian SCI population (Munce et al., 2014).
However, in the current study, videoconference use was not found to be as common among those who were not sufficiently meeting the PAG-SCI compared to those meeting the aerobic and/or strength-training guidelines (42.1% versus 63.6%, respectively). A plausible explanation for this distinctive characteristic is that those who engage in some form of LTPA possess the motivation and confidence in seeking real-time modes of communication and social participation. Furthermore, due to the greater time demands for self-managed LTPA, these individuals are more likely to possess the self-regulatory skills to balance their activities of daily living (Martin Ginis, Latimer, Hicks & Craven, 2005) with social activities involving asynchronous Internet-based communication. Given that time availability and family and work commitments were the most frequently selected personal barriers to videoconference use (70% and 53.3%, respectively), future LTPA-enhancing interventions delivered via videoconference targeting LTPA intenders should accommodate to the specific time that these participants prefer to participate in a videoconference program. In the current study, participants, overall, reported a preference for half an hour sessions during late morning or mid-afternoon weekdays. In order to reach out to a large geographic range and target LTPA intenders in a virtual setting, the first key step is to attend to these needs and preferences to provide easily accessible LTPA support.

4.2 Study 2 main findings

The pilot-testing of the e-SMART program revealed Skype® to be a feasible, acceptable and useful platform for delivering LTPA peer support to LTPA intenders and actors with SCI. The combination of objective and self-report findings complements each of these three aspects of evaluation and provides stronger support that videoconference is a well-received platform for delivering LTPA support to an informal peer support group composed of intenders and actors with SCI.

The feasibility of delivering a LTPA peer support program (adapted from a previous GMCB intervention; Brawley et al., 2013) via Skype® was well-received by participants, as illustrated through their positive feedback regarding the time given, virtual setting/space and the learning strategies used to facilitate informational (i.e., self-management) and emotional (i.e., social validation and empathy) support. Given that the duration of the sessions were longer than
planned, it is reassuring that participants maintained a positive view towards the delivery of the e-SMART program. It is speculated that those who reported time commitment barriers in Study 1 may have had preconceived notions about environmental factors influencing the quality of the virtual space and, thus, time demands for real-time communication (i.e., doorbells, telephone calls or family members). The observation data indicates that this did not appear to be a large concern given the minimal external interruptions to the flow of the videoconference sessions. Therefore, external interruptions may have been highly valued amongst the participants contributing to the overall positive views towards the feasibility of the e-SMART program. Additionally, participants appeared to be highly engaged in the problem-solving component of the group discussions. As illustrated in Figure 3 depicting the duration of each aspect of the sessions, participants were highly engaged throughout the sessions (i.e., homework review, self-management lesson and debrief). An example of a problem-solving case was regarding participant resistance towards a certain idea or experience, such as the application of specific self-regulatory skills between sessions (e.g., self-monitoring). The group facilitator would acknowledge this barrier and call upon other group members to provide their feedback as a means for identifying commonalities within the group and opportunities for peers to provide each other feedback and a new perspective on an issue. Additional time was also spent taking advantage of the Skype® collaborative features such as instant messaging and screen sharing to promote problem-solving. Despite being time-consuming, these instances of problem-solving can enhance group cohesion; and therefore, have been highly encouraged in the group-mediated intervention literature (e.g., Brawley, Rejeski & King, 2003; Estabrooks, Harden & Burke, 2012). Nevertheless, future informal peer support programs via group videoconference should aim to keep sessions under one hour to accommodate to participant time demands (i.e., family and work commitments). Given that several participants expressed a desire to increase their knowledge regarding self-regulatory skills, gain more opportunities to practice these skills throughout the program and build stronger social relationships, it was recommended at the program follow-up assessment to extend the program to at least six sessions. This supports the design of previous GMCB interventions, which have been shown to effectively deliver intensive self-regulatory group counselling sessions for a minimum of 7 weeks (e.g., Brawley et al.,
Moreover, a longer program duration can reduce the amount of time needed to facilitate each session; thereby, alleviating participant time burden.

The feasibility of the e-SMART program for meeting the participant’s task and social needs was further supported by the objective and self-report outcomes of program acceptability: 1) high attendance rate; 2) participation in the buddy system (group emails); and 3) high level of overall enjoyment reported at the program follow-up assessment. The level of commitment and enthusiasm expressed by participants towards the e-SMART program may be a result of the strengthened group unity as the sessions progressed (i.e., group collaboration trends; see Figures 5 and 6). Notably, group unity was most exemplified through the determination that participants had to manage unforeseen time conflicts to attend certain session times or dates. Two examples of time conflicts were medical appointments and family events. The increasing group collaboration that was observed among Group 2 participants through their increased use of the Skype® collaborative functions as the sessions progressed (i.e., instant messaging; see Figure 6) was a strategy used to demonstrate their motivation to work together to reschedule a particular session at a time that was most suitable for the entire group. This sense of accountability to the group is speculated to be a result of the responsibility attached to meeting the group goal and following up with each other on LTPA progress at each subsequent session. As supported in previous virtual group dynamics literature (e.g., McKenna & Green, 2002), the establishment of a group goal at the start of the program can impact attraction towards the group, thus, set the stage for future participation. Furthermore, the implications of building accountability towards a group goal has been supported by a wealth of literature related to LTPA promotion and adherence to self-management peer support groups (e.g., Dorn & Hoebbel, 2012, p. 288; Dominick & Morey, 2006, p. 65; Estabrooks et al., 2012).

The feasibility findings indicate that the e-SMART program was capable of facilitating group collaboration and building group unity on the videoconference platform successfully. However, there were challenges in promoting social interaction amongst the group members between the Skype® sessions (i.e., the buddy system). It was not until the second and third session that participants were more interested in keeping in contact with their peers between sessions. This suggests that the buddy system, whether it is introduced in a virtual or face-to-face environment,
may not be feasible following the first session of an informal peer group program that is solely dedicated to group development (i.e., establishing group commonalities and a group goal) amongst an informal network of peers that have just met for the first time. This is especially the case when the group is comprised of a diverse set of individuals with different levels of LTPA experience. Previous GMCB interventions (Brawley et al., 2013) have involved groups of individuals who have interacted together and possess similar characteristics and experiences (i.e., LTPA actors involved in the same structured, supervised exercise program), and for this reason alone, the buddy system is most likely to be attempted much earlier in the intervention. Furthermore, participants may be more motivated and inclined to follow-up with each other once they begin learning self-regulatory tools through collaboration and problem-solving opportunities (i.e., the self-monitoring and goal-setting lessons). Previous literature supports the use of buddy system for fostering physical activity counselling and accountability in a social environment (Dorn & Hoebbel, 2012, p. 288). Therefore, the buddy system is suggested to be an attractive and useful component of a virtual peer support program when participants are given sufficient amount of time to build a strong bond with their peers; as well as, given the tools to make changes in their behaviour and increase their motivation to keep the group updated on their progress.

Despite the minimal amount of time (i.e., 4 weeks) to enhance social bonding and build a sufficient amount of skills to promote the buddy system, the Skype® platform was shown to be a useful tool for facilitating group cohesion and learning within the e-SMART program. This was demonstrated through direct observations of increased sharing among the group participants (i.e., past LTPA experiences and demonstrating exercises), expressions of normative beliefs (i.e., injunctive social norm: “We [wheelchair users] should be keeping physically active to manage our weight”) and use of the Skype® platform functions (i.e., instant messaging and screen sharing). These positive findings for the objectively measured group collaborative outcomes are further supported by the responses that participants provided within the self-report group development check measures at the session 4 assessment. By session 4, 75% and 87.5% of the participants, respectively, agreed that the group discussions contributed to: 1) their motivation to use the acquired self-regulatory skills (i.e., perceived usefulness of the program
content); and 2) ultimately meet the group goal of adding a bout of LTPA to their weekly routine (i.e., perceived group cohesion).

According to the current literature pertaining to virtual group dynamics, individuals who closely identify with the group and gain a sense of trust on the virtual platform are more likely to foster these aspects of group collaboration (Amichai-Hamburger & McKenna, 2006; McKenna & Bargh, 1999; McKenna & Green, 2002). This further supports the previously stated speculation that the extent to which participants share common characteristics (i.e., LTPA actors or meeting the PAG-SCI) can have an impact on receptivity to the buddy system. The opportunity to engage in group discussion with relatable peers is highly recommended by program participants and interventionists alike, as it has been shown in previous literature to enhance self-acceptance and deindividuation, which refers to the disclosure of information that is typically not expressed out of fear of negative judgments (Amichai-Hamburger & McKenna, 2006; McKenna & Bargh, 1999; McKenna & Green, 2002). However, in contrast to the research conducted by McKenna & Green (2002) that recommends maintaining anonymous interaction on the Internet, Study 2 has shown that a virtual, face-to-face platform (i.e., videoconference) can also foster group identity and collaboration through the identification of shared normative beliefs and intentions (i.e., LTPA behaviour). It is important to note that the belief that anonymity promotes deindividuation may be solely relevant to certain groups that experience social anxiety resulting from extreme stigmatization (McKenna & Green, 2002). Therefore, it is suggested that utilizing a group facilitator for delivering programs such as GMCB can play a useful role for alleviating feelings of apprehension on a videoconference platform. As group members are introduced to each other, the first goal of the group facilitator is to engage participants in activities that illuminate commonalities within the group (Brawley et al., 2014; Cartwright, 1972). Therefore, this will help develop a sense of social identity with the group; thereby, creating a safe and trusting environment conducive for sharing attitudes, beliefs and experiences.

The importance of building positive group identity and cohesion cannot be understated, especially in a real-time videoconference setting, given the observations seen in the current study regarding collaborative technical support. During cases of technical difficulties on the Skype® platform, it was shown that the platform remained useful for peers to provide each other
with troubleshooting support, especially among those who have extensive experience with using videoconference platforms. This was specifically shown within Group 2 after several sessions of becoming familiar with the platform and their peers. The positive change in perceived group cohesion at session 4 provides additional support that the peer-to-peer interactions during technical difficulties could potentially have made a strong impact on learning and social bonding.

It is noteworthy that these troubleshooting experiences within Group 2, during the final session, were predominately related to poor audio and video connection, as opposed to other technical difficulties, such as joining a group call or operating the Skype® functions (e.g., screen sharing). Furthermore, these difficulties were most likely impacted by the changes in computer location and consequently, the available network bandwidth from the group video call host (i.e., group facilitator) during the final session. Given that the available upstream bandwidth (i.e., the speed at which outgoing information is transmitted from the sender) plays a larger role on video and audio transmission quality on the receiving end, rather than the receiver’s own downstream bandwidth connection (Gibson et al., 2010), it is important to account for the videoconference host’s Internet connection when interpreting the quality feedback usability scores (i.e., perceived ease of operating the Skype® functions and troubleshooting; see Table 11). While the assessment of video quality was based on one scale item in the quality feedback assessment, it is important to consider that the participant who was experiencing poor video connection during the fourth session was able to continue using the Skype® platform and interact with the group through audio-only connection and instant messaging. The approach to using audio-only communication was suggested by a fellow peer who explained that the audio-only function can reduce the amount of downstream bandwidth required to connect with the group call. This is another example of how problem-solving was encouraged and made useful for meeting the technical needs of the participants. Thus, the additional technical support that was required in the e-SMART program due to the use of the Skype® platform for facilitating group cohesion and collaboration may provide an explanation for the longer than anticipated session durations throughout the 4-week program in comparison to the original face-to-face delivery of GMCB to LTPA actors with SCI (Brawley et al., 2013). Although providing technical support most likely contributed to each of the participant’s overall perception of group cohesion, future research is
needed to make the best use of the GMCB program by enhancing self-management support amongst an informal peer group and less of a focus on technical support. One potential strategy is to provide easily accessible and brief online tutorial videos explaining how to solve or mitigate common technical barriers experienced on videoconference platforms. Overall, differences in group characteristics were found between Group 1 and 2 participants, which may inform the abovementioned results of Study 2. Group 1 (versus Group 2) had a smaller proportion of participants meeting the aerobic and strength-training PAG-SCI at baseline (i.e., 2 out of 5 versus 2 out of 2 group members), a larger age range (i.e., 28-58 years old vs. 35-42 years old), greater number of years post-injury range (7-43 years vs. 11-35 years), more group members who reported being married or in a relationship (i.e., 4 out of 5 group members vs. no Group 2 participants), and more power wheelchair users (3 out of 5 group members vs. 1 out of 4 group members). Study 1 findings indicated that lower LTPA levels and living with a spouse – characteristics that were both found to be higher among Group 1 versus Group 2 in Study 2 – were more prominent characteristics reported among non-frequent videoconference users. Fortunately, lack of videoconference use prior to enrolment in Study 2 did not appear to have a negative influence on the frequency or management of technical difficulties. In fact, the videoconference orientation activity was even removed from the first session in the Group 1 as a result of group consensus on familiarity with the Skype® functions. This counters previous literature which suggests that videoconferencing attracts a younger demographic of individuals with SCI with greater technological skills (Stapleton, 2014), and that technical support from a professional is required for a greater quality videoconference experience (Taylor, 2012).

One potential explanation for the difference between the current study and previous research utilizing a Skype® videoconference platform for providing social support (e.g., Stapleton, 2014) is that participants in Study 2 were given with the knowledge and skills to navigate through the Skype® platform (e.g., monitoring video and audio settings) and to practice performing Skype® functions (e.g., screen sharing) during the 20-minute one-on-one videoconference tutorials with the group facilitator prior to the commencement of the e-SMART program. This tutorial was useful for both the participants and group facilitator to confirm that all videoconference equipment was available, software was up-to-date, and that all participants understood the program expectations. Therefore, the videoconference tutorial played a role in closing the gap in
videoconference skill level between novice and advanced Internet users. The implementation of a tutorial session most likely provided a safe and non-judgmental environment for individuals to enhance their videoconference self-efficacy through theoretically-informed aspects of mastery experience and vicarious learning (e.g., facilitator demonstrations) (i.e., social cognitive theory; Bandura, 1997). In fact, participants indicted several positive, individually created, descriptors of the one-on-one videoconference at the program follow-up assessment, such as “application-based”, “builds confidence”, “encouraging and motivating” and “personal and informative”. As such, it is recommended that future LTPA-enhancing interventions implement a tutorial session in order to reduce troubleshooting time and enhance the task and social needs of the group.

The group-mediated nature of this pilot program provides further support that groups can be a resource for meeting the technical needs (e.g., troubleshooting support), in addition to the task (e.g., self-regulatory training) and social needs (i.e., social validation) within a virtual program (McKenna & Green, 2002). When examining the various indicators of group collaboration (i.e., indicators of sharing, normative belief expressions and use of Skype® collaborative functions) that were evaluated in Study 2, there were two patterns that emerged between the two groups. In Group 1, the highest group collaborative scores occurred at Session 1 and Session 4 (as evident in the U-shaped curve presented in Figure 5), while Group 2 displayed an increasing trend in frequency for these group collaboration indicators from Session 1 to Session 4. One possible explanation for the higher level of engagement observed in the first and last sessions for Group 1 may be a result of specific preferences for mode of group collaboration and type of self-regulatory training being provided during those two sessions. According to the findings in Study 1, the most receptive mode of group collaboration was the go-rounds activity and the top two learning preferences among the least physically active subgroup (i.e., not meeting the PAG-SCI) were overcoming LTPA barriers (63.2%) and obtaining community-based resources (47.4%). These preferences were, in fact, the primary focus during Sessions 1 and 4 for Group 1. During session 1, each participant was highly encouraged to share, through non-discussion based participation activities (i.e., go-rounds), their LTPA experiences and learning objectives as a strategy to establish commonalities within the group. Meanwhile, only session 4 targeted the top two self-management lessons recommended in Study 1, primarily through go-rounds collaboration. The lessons related to self-monitoring (session 2) and goal-setting (session 3), on
the other hand, were heavily reliant on the use of Skype® collaborative functions. Therefore, the change in mode of collaboration during sessions 2 and 3 to screen sharing, for example, explains the reduced frequency of using the Skype® collaborative functions in Group 1.

Aside from the frequency differences in collaboration between the two groups, the quality of the collaborative efforts seemed to have a great influence on group learning and cohesion for both groups in Study 2. In particular, the types of sharing and the source of normative beliefs were important aspects to the level of understanding of group dynamics and learning that occurred throughout the four weeks. In the context of sharing, participants in both groups appeared to retain their peers’ unique goals expressed throughout the 4-week e-SMART program and shared useful LTPA resources tailored to specific individuals. For instance, a participant in Group 1 shared and demonstrated how to use a breathing apparatus (i.e., lung flute), while specifically having a fellow peer in mind who reported in a previous session difficulties in managing respiratory functioning while performing moderate-to-heavy intensity LTPA. Additionally, a participant in Group 2 described two LTPA resources (i.e., an activity tracker app and a vita glide® machine) which they found useful to increase their community involvement and to meet their LTPA goals. The website for the activity tracker app was screen shared to the group and a video of the participant using the vita glide machine was displayed. The sharing and demonstration of LTPA resources, notably through electronic format, were likely facilitators of the vicarious learning and verbal persuasion (Bandura, 1997) that appeared within both groups.

The expression of normative beliefs (i.e., descriptive and injunctive social norms), however, was most prominent in Group 2, most likely due to the equal ratio of those meeting (i.e., LTPA actors) and not meeting (i.e., LTPA intenders) the aerobic and strength-training guidelines, compared to Group 1 (2:3 intenders versus actors). The LTPA actors were typically the group leaders who possessed experiential knowledge relevant to LTPA behaviour and provided a combination of informational and emotional support to their peers. For example, one participant made a statement that persons with SCI have more negative consequences linked to sedentary behaviour, such as increased weight gain [injunctive norm]. Following the third session, LTPA actors sent out group emails to update their peers on their progress by describing their daily routines and exercise bouts. Previous research has also supported the use of email messaging for
instilling descriptive normative beliefs, and more specifically targeting those with lower baseline LTPA levels (Priebe & Spink, 2012).

Furthermore, the use of role models is supported by findings from Study 1 indicating that the majority of participants preferred gaining LTPA support from peers who are more physically active. In Study 2, it appeared that the role models were a source of encouragement for other less physically active peers to share personal LTPA goals and experiences. For example, several participants described and even demonstrated exercises that they found useful but struggled to engage in on a regular basis. In the virtual group dynamics literature, it is agreed upon that connecting individuals with like-minded peers with experiential knowledge is a key contributor to enhanced ICP participation motivation (e.g., status incentives; LaRose, 2001) as well as social acceptance and normalization of peer identities (McKenna & Green, 2002). Thus, consideration of group characteristics in terms of knowledge and expertise is necessary to help foster group unity and collaboration. Overall, participants appeared to be very engaged and supportive within their groups. The quality rather than the quantity of the collaborative efforts (i.e., sharing and expressions of normative beliefs) support the case that learning did occur and motivation to meet the group goal was enhanced throughout the four weeks. Furthermore, this provides evidence that informal peer group networks can successfully provide social support and build motivation.

Finally, although LTPA behaviour change was not the primary objective of this pilot study, it is worthy to note the observed decrease in strength training LTPA levels at the program follow-up assessment. Due to the short 4-week assessment period, it is likely that LTPA levels were reduced to some degree in order to meet the goals of each group. On a positive note, this provides further support that the key indicators of group processes (e.g., sacrifice; Carron & Spink, 1993) were in alignment with the common task needs of the group (i.e., aerobic physical activities). For future informal peer support groups delivered via videoconference, the proposed one-on-one sessions can potentially enhance informational support while focusing on tailored problem-solving strategies that would assist in the planning and maintenance of both aerobic and strength-training activities. Considering the varying level of support needed to manage activities of daily living in the SCI population, the provision of tailored self-regulatory sessions
can help participants focus on their individual LTPA support needs. Indeed, future reach is needed to examine the efficacy of incorporating one-on-one and group-based sessions into an LTPA peer support program to help meet the task (i.e., self-regulatory skills) and social (i.e., emotional support) needs of the SCI population.

4.3 The “ideal” virtual peer support group

Study 2 provided an opportunity to observe the pattern of learning and group dynamics within two distinct groups. The main lesson learned from these two groups was that role models (i.e., LTPA actors) greatly influence the provision of informational and emotional support. The smaller number of LTPA actors in Group 1 made it a challenge to support collaboration during some of the self-management lessons (i.e., self-monitoring and goal-setting) and enhance the benefits of the buddy system between sessions. Given that the aim of a future larger study is to facilitate self-management training for LTPA intenders and actors in a videoconference setting, this thesis suggests that an ‘ideal’ group for this type of setting should be composed of an equal ratio of LTPA actors and intenders to help foster LTPA behaviour change. Future studies should consider LTPA experience levels within groups, rather than solely LTPA mindset. In the current study, the groups in Study 2 were composed of either individuals meeting all of the guidelines or none of the guidelines (neither aerobic nor strength training). Due to the varying LTPA patterns in the SCI population (Sweet et al., 2012; Martin Ginis et al., 2005), it is possible that LTPA intenders may have been following the PAG-SCI for an extended period shortly prior to baseline testing. Thus, considering LTPA experience levels can provide a more accurate representation of the kind of support that each participant can make within their informal peer group. Additional demographic consideration should be made in regards to the age composition of the peer support group, since each life stage can present time barriers specific to daily routines (e.g., school, family, careers, and volunteerism). According to Study 1 survey respondents, the most preferred time to participate in a videoconference session were weekdays in the late morning or early afternoon (i.e., 11:00am-2:30pm) for approximately 30 minutes. Given the nation-wide reach of Study 2, special consideration was made for time zone
differences. In some instances, this was made to be a challenge, especially when participants from difference time zones requested the same time. Therefore, it is recommended that videoconference sessions are scheduled in a manner that accommodates to the preferred time range in all time zones. Moreover, a group composed of peers living in close proximity to each other can provide opportunities for face-to-face LTPA interaction.

Time challenges appeared to be a common theme within the open-ended response feedback received from participants at the program follow-up assessment. Given that the sessions lasted longer than anticipated, several participants expressed the need for sessions that focused primarily on socialization and emotional support. In Study 2, the aim was to foster group unity and socialization through the implementation of self-regulatory skill training (i.e., teaching self-monitoring and goal-setting skills). The emotional peer support provided in the e-SMART program was described by the participants as an opportunity to give words of encouragement related to LTPA behaviour and to discuss their everyday lives (i.e., careers and volunteerism). During the final debrief section of each session, many participants expressed statements of ‘not feeling alone’ and also expressed how they appreciated the opportunity to learn that their peers are going through similar challenges related to LTPA behaviour, and that each peer has a unique strength and skill set to teach the group, despite having different functional abilities. Indeed, these instances of story-telling have been supported by past LTPA-related research in the SCI population indicating that informal, peer-based discussions that have a large focus on evoking relatable feelings can ultimately promote LTPA behaviour change (Perrier, Smith & Latimer-Cheung, 2013; Smith, Tomasone, Latimer-Cheung & Martin Ginis, 2015).

As such, it is recommended that the future implementation of videoconference-delivered LTPA-enhancing interventions, such as the GMCB intervention (e.g., Brawley et al., 2013), be designed in a manner that program sessions alternate between one-on-one skill building sessions with a trained behaviour change instructor (i.e., learning how to use the self-regulatory tools) and a peer group-based session dedicated to facilitated application of skills and group discussions (e.g., live demonstrations and monitoring group progress). A proposed example for this kind of tailored intervention is providing a brief 20 to 30-minute lesson on self-management strategies at a time that is convenient for the participant via videoconference; followed by a 30-
minute group session to practice the self-regulatory skills with an informal peer group network via videoconference. Given that results from Study 1 demonstrated the value of having an SCI peer as a group facilitator; it would be beneficial for future research to consider evaluating the feasibility of including an SCI peer mentor trained in GMCB interventions for the one-on-one self-regulatory skill building sessions. Taken together, this proposed organization of the GMCB intervention can help tailor the skill building and application goals to the learning needs and time demands of the individual; while simultaneously incorporating a role model for targeting key constructs of self-regulation (e.g., vicarious learning and verbal persuasion (Bandura, 1997; Martin Ginis et al., 2013). Given that emotional support was expressed as a highly valued element of the peer support program, a more in-depth analysis of the extent to which a program, such as one that incorporates a one-on-one skill building session and a group skill application session can incorporate various aspects of social support (i.e., informational and emotional support). Furthermore, it is highly recommended that future research utilize validated social support measurement scales.

4.4 Strengths, limitations and future research implications

The knowledge generated within the current thesis is supported by several methodological strengths. Firstly, in terms of Study 1, the demographic profile of the sample was demonstrated to be representative of the demographic proportions among the Canadian SCI population. Secondly, in terms of Study 2, it is important to take into consideration that given the challenges of intervention recruitment and adherence within the SCI population (e.g., high attrition rate; Martin Ginis & Hicks, 2005), it is encouraging to observe excellent attendance rates (i.e., > 90%) through the use of videoconferencing. Lastly, the use of complimentary objective and self-report evaluation measures allowed for a more in-depth understanding of the key indicators of group collaboration and observed engagement to support participant’s perceptions of the quality of the e-SMART program.

However, caution should be made towards the chosen recruitment strategy, as well as the self-report measurement scales used for the current thesis. Given that participants were recruited entirely from a database of adults with a SCI who were previously involved in LTPA-related
research, there is a risk for response bias based on participant outcome expectancies towards the research aim. The recruitment database was created by a national SCI community-based initiative called SCI Action Canada. The aim of this organization is to provide evidence-based LTPA resources to the SCI community through various interpersonal communication channels of promotion such as presentations and interactive activities at sites made accessible to the SCI community through transportation services (e.g., Gainforth, Latimer-Cheung, Athanasopoulos & Martin Ginis, 2013). Meanwhile, a network of approximately 522 SCI contacts from across Canada has accumulated through these event-based initiatives, and as such, have been followed up by researchers seeking participants for LTPA-related research projects (e.g., health behaviour change surveys and exercise interventions). Despite great efforts to reach the SCI community through various interpersonal channels (Gainforth et al., 2013; e.g., SCI organization websites and social media profiles) and considering the challenges of recruitment within the SCI community overall (Gainforth et al., 2013; Martin Ginis & Hicks, 2005), the SCI Action Canada research participant database was proven to be the most efficient source for Study 1 recruitment within a 1-month time period. Furthermore, since the recruitment strategy for Study 1 was limited to Internet users with an email account, it is understood that the participant reach is further narrowed down to individuals that had a considerable level of digital literacy. Although the primary aim of Study 1 was to understand the videoconference needs and preferences of Internet users with SCI, it would be beneficial to undertake further research on examining the receptivity levels among non-Internet users, particularly those living in rural communities that lack accessible LTPA facilities. This particular subgroup can be targeted through paper-based surveys via mail. Those who express receptivity would facilitate further examination of videoconference tutorial utility and videoconference software usability, specifically among novice Internet users.

In terms of self-report measurement scales, some of the measures that were used such as the group development check scales, were adapted from the GMCB intervention due to the novel scope of research, for Study 2 in particular (Brawley et al., 2013) in order to provide relevance for the videoconference context (McKenna & Green, 2002; Nazzaro & Strazzabosco, 2009) as well as the e-SMART program objectives (i.e., accommodate to LTPA intenders not originally involved in a structured, supervised exercise program [e.g., Brawley et al., 2013]). Given that
this is the first study to examine this, there requires further testing to validate the internal consistency of the scale items. Fortunately, the results presented from Study 2 demonstrate agreement between participant feedback and direct observations of feasibility, acceptability and usefulness of the Skype® platform. Finally, given the descriptive nature of these two studies, relationships and causal inferences cannot be made between the demographic variables and main study outcomes related to videoconference receptivity and group collaboration. However, these two descriptive studies are the first of their kind to examine videoconference-related needs and preferences (Study 1) as well as virtual group dynamics in an informal peer support context (Study 2) among a sample of LTPA intenders and actors with a SCI.

4.5 Conclusion

Overall, the results from this thesis support the use of videoconference for facilitating key group processes in a LTPA peer support program (Estabrooks et al., 2012). A receptivity and needs assessment and pilot program evaluation are the first two key steps to generating knowledge and moving the SCI rehabilitation research forward towards the delivery of tailored LTPA-enhancing interventions in a virtual environment. The benefits of videoconference for replicating real-time, face-to-face interaction and the ability to reach out a wider geographical range represents the promising role of this mode of intervention delivery for establishing informal peer support networks for those who are in greatest need of LTPA behaviour change and social participation.


behavior contagious: associations of social norms with physical activity and healthy eating. 


Brawley, L. R., Rejeski, W. J., & King, A. C. (2003). Promoting physical activity for older


Sutton, S. (2008). How does the health action process approach (HAPA) bridge the


Appendices

Appendix A: Study 1 eligibility criteria questionnaire

Name:________________________________

Date:____________________

Phone number:_______________________

Email Address:_______________________

Date of SCI:_______________________

Level of injury (e.g., C1):____________

Injury severity (i.e., complete or incomplete):_____________________

Do you have access to the Internet? [Y] [N]

Are you able to speak fluently in English? [Y] [N]

Are you able to read fluently in English? [Y] [N]

Have you ever been told that you suffer from any cognitive impairments and/or memory disorder? [Y] [N]

Do you have trouble remembering things day to day? [Y] [N]

• Are your memory problems related to a cognitive impairment or usual forgetfulness? [Y] [N]

Are you currently engaging in LTPA at the level recommended in the Physical Activity Guidelines for Adults with SCI? [Y] [N]

- 20 minutes or more of moderate to vigorous intensity aerobic activity 2 days per week AND strength training exercises of each major muscle group consisting of 3 sets of 8-10 repetitions for each exercise 2 times per week

In the next 2 months, would you be interested in adding a 20-minute bout of moderate-heavy intensity physical activity (aerobic or strength-training) to your weekly routine.

1) No → Non-intender – INELIGIBLE

2) Yes → Intender – ELIGIBLE
Appendix B: Study 1 online survey

UNIVERSITY OF TORONTO
FACULTY OF KINESIOLOGY & PHYSICAL EDUCATION

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e-SMART study

Online SCI community support programs: Needs, Preferences, and Past Experiences

CONSENT: I have been given information about the e-SMART study being conducted by Samantha Jeske (MSc. candidate) and Dr. Kelly Arbour-Nicitopoulos from the Faculty of Kinesiology and Physical Education at the University of Toronto. I have had the opportunity to ask questions about my involvement in this study and to receive the additional details I requested. I understand that if I agree to participate in this study, I may withdraw from the study at any time.

☐ I have read and understand the details about the research study outlined in the Letter of Information. (Required for participation)

☐ All of my questions and/or concerns pertaining to this research study have been answered by the Principal Investigator or the University of Toronto Research Ethics Board. (Required for participation)

☐ I voluntarily agree to participate in the first phase of the study. (Required for participation)

☐ I voluntarily agree to being contacted following the completion of the online survey for a follow-up pilot study. (Not a requirement for participation in phase 1)

PARTICIPATION REWARD CONSENT: Following the completion of this survey, you will be given a $10 electronic Starbucks gift card.

☐ I voluntarily agree to have a Starbucks e-gift card sent to my specified email following my participation in this survey.

☐ I prefer not to receive a reward following my participation in this survey.

Please enter your unique identification number provided in the email containing this survey link.
PART A: DEMOGRAPHIC INFORMATION

Age:__________

Sex: [M] [F]

Cause of injury:

Motor vehicle accident

Sport accident

Fall

Violence (gunshot wound)

Spinal deformity

Tumour

Other (please indicate): ______________________

What is your primary mode of mobility outside the home?

Manual wheelchair

Power wheelchair

Walker

Braces

Cane

Walk independently

Other (please indicate): ______________________

Which of the following describes your ethnicity?

White
Native Canadian
Black
Asian
Other (please indicate): ______________________

What is the highest level of education you have completed?
High school
College
University
Post Graduate
Other (please indicate): ______________________

What is your marital status?
Single
Common Law
Married
Divorced
Widowed

Where would you describe your geographical location of residence for the next 2 months (length of study)
Time zone
[Pacific]
[Mountain]
[Central]
Environment setting

Urban

Rural

What is your preferred mode of Internet broadband connection:

Digital Subscriber Line [DSL]

Cable modem

Fiber optic technology

Wireless

Satellite

Broadband over powerline

Other (please indicate): _______________________

What kind of computer operating system do you use?

Windows

Mac

Other (please indicate): _______________________

Do you own a built-in or external computer webcam?

Yes
PART B: LEISURE-TIME PHYSICAL ACTIVITY BEHAVIOUR

This next question asks you about the time you spent engaging in leisure-time physical activity (LTPA) in the last 7 days. LTPA is physical activity that you choose to do during your free time, such as exercising, playing sports, gardening, and taking the dog for a walk (necessary physical activities such as physiotherapy, grocery shopping, pushing/wheeling for transportation are not considered LTPA). These are either aeroBIC activities, which increase heart rate and breathing, or strength training activities, which include lifting weights or using elastic resistance bands. The greatest fitness benefits can be achieved from regularly engaging in moderate to heavy intensity aerobic and strength-training LTPA.

Mild intensity activity requires very light physical effort and makes you feel like you are working a little bit, but you can keep doing the activity for a long time without getting tired.

Moderate intensity activity requires at least some physical effort and allows you to keep doing the activity for a while without getting tired.

Heavy intensity LTPA makes you feel like you are working really hard, almost at your maximum. You cannot do this heavy intensity activity for very long without getting tired. These activities may be exhausting.

During the last 7 days, on how many days did you do aerobic LTPA at a mild intensity? _____ days

On those days, how many minutes did you usually spend doing aerobic LTPA at a mild intensity? _____ minutes

During the last 7 days, on how many days did you do strength-training LTPA at a mild intensity? _____ days

On those days, how many minutes did you usually spend doing strength-training LTPA at a mild intensity? _____ minutes
During the last 7 days, on how many days did you do aerobic LTPA at a moderate-heavy intensity? _______ days

On those days, how many minutes did you usually spend doing aerobic LTPA at a moderate-heavy intensity? _______ minutes

During the last 7 days, on how many days did you do strength-training LTPA at a moderate-heavy intensity? _______ days

On those days, how many minutes did you usually spend doing strength-training LTPA at a moderate-heavy intensity? _______ minutes

PART C: SOCIAL PARTICIPATION & COMMUNICATION

The purpose of the first section of this survey is to gain an understanding of your experience engaging in face-to-face and Internet-based activities and programs.

On average, how many hours per week do you participate in an activity or program outside of your home and, if applicable, rehabilitation centre?

Overall, how satisfied have you been with your social activities outside of your home within the last 6 months?

- 1 (very dissatisfied)
- 2 (somewhat dissatisfied)
- 3 (neutral)
- 4 (somewhat satisfied)
- 5 (very satisfied)

Do you engage in Internet-based social networking sites (e.g., Facebook and Twitter) or community education/support programs (e.g., Get In Motion, Canadian Paraplegic Association Message Board, Spinal Injuries Association Community Message Board, The Spinal Cord Injury Zone)?

- Yes
- No

Please review the key terms below prior to answering the following questions.
Synchronicity: engaging in Internet-supported communication with 2 or more people at the same point in time (e.g., videoconferencing).

Asynchronicity: engaging in Internet-supported communication on an individual basis, whereby, participants send messages independent of the recipient’s online status (e.g., email).

Discussion forums: publicly accessed, conversation services; each initiated by like-minded groups of people or communities. Conversation members may be introduced to each other for the first time at the start of an online discussion.

Instant messaging/SMS: ‘real-time,’ synchronous, and short message transmission between one or more people who have previously been in contact.

Public chat rooms: ‘real-time,’ synchronous, and short message transmission between a small or large group of people (up to 200 users). Conversation members may be introduced to each other for the first time at the start of an online discussion. Messages are continuously being sent with the development of individual message threads (i.e., sub-messages).

Videoconference: ‘real-time,’ synchronous transmission of audio and video signals between 2 or more users at any geographical distance (e.g., SKYPE, Google groups). Conversation members may be introduced to each other for the first time at the start of an online discussion.

Select the type(s) of Internet-based communication platforms that you have previously used, at any point in the past, or are currently using.

- Discussion forums
- Email messaging
- Instant messaging/SMS
- Public chat rooms
- Videoconference
- Other (please specify in the space provided) ______________________
- None

PART D: PERCEPTIONS OF ONLINE COMMUNITIES

The following questions ask about your attitudes and motives toward Internet-based communication platforms.

1. To what extent do you VALUE online communication on a scale from 1 (low) to 5 (high).

- 1 (low)
- 2
- 3
2. To what extent do you enjoy using the Internet to interact with others (e.g., email, instant messaging or video-conference) on a scale of 1 (do not enjoy at all) to 5 (enjoy very much)

1 (I do not enjoy at all)

2 (I somewhat do not enjoy)

3 (neutral)

4 (I somewhat enjoy)

5 (I enjoy very much)

3. Which aspects of online social programs (e.g., Facebook, Twitter, Skype, or SCI community message boards) do you find APPEALING (select all that apply)?

☐ Connecting with like-minded individuals

☐ Connecting with new people

☐ Gaining new knowledge and different viewpoints

☐ Physical barrier between group members

☐ Real-time communication

☐ Sense of anonymity

☐ Sense of independence

☐ Sharing own experiences, beliefs and knowledge

☐ Text-based communication

☐ Easy access to communication and support

☐ Other (please specify in the space provided) ______________________
Which aspects of online social programs (e.g., Facebook, Twitter, Skype, or SCI community message boards) do you DISLIKE (select all that apply)?

☐ Connecting with individuals with different viewpoints
☐ Connecting with new people
☐ Hostility or aggressive tone of discussions
☐ Lack of personal connection
☐ Privacy concerns
☐ Real-time communication
☐ Sharing own experiences, beliefs and knowledge
☐ Text-based communication
☐ Voice communication
☐ Other (please specify in the space provided) ______________________

PART E: PHYSICAL ACTIVITY ONLINE SUPPORT GROUPS

The following questions ask about your intentions, attitudes and confidence in participating in online physical activity support groups. Group members may be introduced to each other for the first time at the start of an online discussion.

If you were offered an opportunity to participate in an Internet-based physical activity support program where you can communicate with other peers with SCI and learn important skills, strategies and resources for leading an independent and physically active lifestyle …

1. How would you rate your level of INTEREST in becoming a member in this program, on a scale from 1 (completely uninterested) to 5 (completely interested)?

☐ 1 (completely uninterested)
☐ 2 (somewhat uninterested)
☐ 3 (neutral)
☐ 4 (somewhat interested)
☐ 5 (completely interested)
2. How likely would you join this kind of program, on a scale from 1 (completely unlikely) to 5 (completely likely)?

- 1 (highly unlikely)
- 2 (somewhat unlikely)
- 3 (neutral)
- 4 (somewhat likely)
- 5 (completely likely)

3. What kind of information would you be interested in learning in a physical activity support group?

- How to set physical activity goals
- How to monitor my physical activity behaviour
- How to plan my physical activities
- How to overcoming barriers to physical activity
- How to obtain physical activity community resources
- How to build and maintain strong social relationships
- Other (please specify in the space provided) ______________________
- None

4. How USEFUL would it be for you to be able to discuss physical activity with individuals who are at a SIMILAR activity level as you, on a scale from 1 (completely useless) to 5 (completely useful)?

- 1 (completely useless)
- 2 (somewhat useless)
- 3 (neutral)
- 4 (somewhat useful)
- 5 (completely useful)
5. How USEFUL would it be for you to be able to discuss physical activity with individuals who are MORE active than yourself, on a scale from 1 (completely useless) to 5 (completely useful)?

- 1 (completely useless)
- 2 (somewhat useless)
- 3 (neutral)
- 4 (somewhat useful)
- 5 (completely useful)

6. How USEFUL would it be for you to be able to discuss physical activity with individuals who are LESS active than you, on a scale from 1 (completely useless) to 5 (completely useful)?

- 1 (completely useless)
- 2 (somewhat useless)
- 3 (neutral)
- 4 (somewhat useful)
- 5 (completely useful)

7. How CONFIDENT would you feel in discussing physical activity with someone you DO NOT know, on a scale from 1 (not at all confident) to 5 (completely confident)?

- 1 (not at all confident)
- 2 (not very confident)
- 3 (neutral)
- 4 (somewhat confident)
- 5 (completely confident)

PART F: ONLINE COMMUNICATION VIA VIDEO-CONFERENCE

Imagine having the opportunity to see and speak to a family member, friend/peer, or health care professional in real-time from across the country right in front of your computer screen. This technology is called videoconferencing (i.e., Skype) and you have the ability to do this on your own with minimal equipment and cost!

The following questions will focus on participation in the previously mentioned online physical activity support program with a group of SCI peers via video-conference. Group members may be introduced to each other for the first time at the start of an online support program.

1. a) Which of the following GROUP COLLABORATIVE activities do you believe would promote your participation in this physical activity support program via video-conference, on a scale from 1 (strongly agree) to 5 (strongly disagree)?

- Identification- introducing one’s own name prior to making a statement.
  - 1 (strongly agree)
  - 2 (somewhat agree)
  - 3 (neither agree nor disagree)
  - 4 (somewhat disagree)
  - 5 (strongly disagree)

- Whole group- the discussion is dominated by a single idea, mood or specific
member(s).

Small group- a brief period of time when the group facilitator deactivates the audio to allow for private discussion between group members.

Brainstorming- all group members are free to call out ideas at any point for the group facilitator to record and stimulate discussion.

Go-rounds- an opportunity for each member to provide their personal insight on a specific question given by the group facilitator.

Fishbowl- one group is designated to discuss a certain topic while the rest of the group listens to the conversation. Following the small group discussion, the rest of the group reconvenes to share everyone’s perspective on the topic.

Active listening- a group member or the group facilitator repeats/summarizes what a group member previously said to ensure full understanding.

Caucusing- dividing the group into small groups with similar viewpoints for further discussion (can be implemented into the Fishbowl technique).

b) If you would like to suggest a group collaborative activity that is not listed above, please describe the activity in the space provided.

2. To what extent would you feel comfortable sharing your ideas on a specific topic during a video-conference session, on a scale from 1 (completely uncomfortable) to 5 (completely comfortable)?

1 (completely uncomfortable)
2 (somewhat uncomfortable)
3 (neutral)
4 (somewhat comfortable)
5 (completely comfortable)
3. How would you prefer the group facilitator to ask for your input on a discussion or question during a video-conference session (check all that apply)?

- ☐ After a private discussion with my group members
- ☐ During the fishbowl activity (one group is assigned to discuss a certain topic while the rest of the group listens to the conversation. Following the small group discussion, the rest of the group reconvenes to share everyone’s perspective on the topic).
- ☐ Only when my hand is raised
- ☐ Other (please specify in the space provided) ________________________
- ☐ I don’t have a preference

PART G: VIDEO-CONFERENCE PARTICIPATION

The following questions ask further about your actual experience, attitudes and confidence towards video-conference in a group environment.

1. How often do you use videoconferencing (e.g., SKYPE, FaceTime, Google groups)?
   - ☐ Daily
   - ☐ Weekly
   - ☐ Occasionally
   - ☐ Rarely
   - ☐ Never

2. Which of the following videoconference services have you previously used or are currently using?
   - ☐ Skype
   - ☐ Google Hangouts
   - ☐ Oovoo
   - ☐ FaceTime
   - ☐ Other (please specify in the space provided) ________________________
   - ☐ None

3. Which of the following technical factors would prevent you from choosing to participate in a group video-conference program (select all that apply)?
   - ☐ Creating a new email account (e.g., Gmail)
   - ☐ Required external equipment (e.g., webcam and speakers)
   - ☐ Privacy/security
   - ☐ Type of bandwidth connection currently using (e.g., cable modem, wireless, satellite)
   - ☐ Downloading a video-conference software (e.g., Skype)
   - ☐ Video and sound quality
   - ☐ Additional assistive equipment (e.g., voice recognition)
   - ☐ Other (please specify in the space provided) ________________________

4. If applicable, please select all assistive technology that you use to enhance computer accessibility (e.g., video-conference participation).
   - ☐ Voice or speech recognition (e.g., Dragon)
   - ☐ On-screen keyboards
   - ☐ Pointing devices (e.g., eye movement signals)
   - ☐ Sip-and-puff system
   - ☐ Wands and sticks
   - ☐ Joysticks
   - ☐ Trackball
5. Which of the following personal factors would prevent you from choosing to participate in a group video-conference (select all that apply)?

- Family and/or work commitments
- Physical appearance
- Medical support
- Time availability
- Other (please specify in the space provided) ________________

6. Would you prefer audio-only correspondence during a video-conference?

- Yes
- No
- Neutral

7. Which of the following characteristics of an online GROUP FACILITATOR would promote your participation in a video-conference program (select all that apply)?

- Similar age
- Post-secondary education
- Experience conducting group-based programs
- Same gender
- SCI peer
- Other (please specify in the space provided) ________________

8. Which of the following characteristics of a GROUP MEMBER would promote your participation in a video-conference program (select all that apply)?

- Similar age
- Same gender
- Similar injury type/level
- Similar physical activity goals
- Other (please specify in the space provided) ________________

PART H: e-SMART Pilot Study (Phase 2)

Your survey responses will help inform the piloting of the exercise-Self-Management Assistance in Real-Time (e-SMART) program via video-conference. The e-SMART program will consist of 4 weekly video-conference sessions with a group of individuals with a spinal cord injury from across Canada that will focus on how to increase participation in leisure-time physical activity. Prior to the group sessions, participants will receive a guide to downloading the videoconference platform and navigating through the platform features. Additionally, the program facilitator will conduct a one-on-one videoconference tutorial in order to familiarize each participant to the platform prior to the first group session. The
goal is to meet each participant’s personal and technical needs in order to provide an accessible online group-based physical activity support program. The three main learning outcomes for this physical activity group support program are: 1) how to keep track of one’s physical activity behaviour; 2) how to set physical activity goals; and 3) how to solve barriers to physical activity.

1. Would you be interested in participating in this 4-week physical activity group support program via video-conference?
   ○ Yes
   ○ No

2. How confident are you that you could participate in this group-based support program via video-conference over the next 2 months, if you were given all the assistance needed for orientation to the videoconference platform (i.e., videoconference instruction manual and videoconference tutorial), on a scale from 1 (not at all confident) to 5 (completely confident)?
   ○ 1 (not at all confident)
   ○ 2 (not very confident)
   ○ 3 (neutral)
   ○ 4 (somewhat confident)
   ○ 5 (completely confident)

3. How long would you be willing to commit to a video-conference session per week?
   ○ 20 minutes
   ○ 30 minutes
   ○ 45 minutes
   ○ 60 minutes
   ○ Other (please specify in the space provided): _________________________________
   ○ N/A

How many days per week would you be willing to participate in the video-conference program?
   ○ Once a week
   ○ Twice a week
   ○ More than twice a week
   ○ I don’t have a preference
   ○ N/A
b) Please indicate if you have specific scheduling concerns that may prevent you from being able to participate in the e-SMART program over four consecutive weekly sessions (e.g., vacation, meetings, etc).

Your survey is complete! Please click "Submit" to send your responses.

Thank you for participating in the e-SMART study. As a token of our appreciation, you will receive a $10 electronic gift card for Starbucks via email (upon your consent).
Appendix C: Comparison of Study 1 sample demographics and Canadian discharge prevalence rates (Farry & Baxter, 2010)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Current sample (N = 30)</th>
<th>Canadian SCI population (discharge prevalence rate; N = 85,556)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (males), n (%)</td>
<td>21 (70)</td>
<td>18,438 (74.3)</td>
</tr>
<tr>
<td>Age (&gt; 34 years old), n (%)</td>
<td>27 (90)</td>
<td>76,298 (89.2)</td>
</tr>
<tr>
<td>Injury level (tetraplegia)</td>
<td>15 (50)</td>
<td>36,632 (43.5)*</td>
</tr>
<tr>
<td>Built environment (urban-dwelling)</td>
<td>22 (73.3)</td>
<td>68,444 (80)</td>
</tr>
<tr>
<td>Province (Ontario)</td>
<td>24 (80)</td>
<td>Range lower limit(^1): 47,695 (55.7)</td>
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<td></td>
<td></td>
<td>Range upper limit(^1): 59,234 (69.2)</td>
</tr>
</tbody>
</table>

Note: (n)(%); Gender rates only include adults aged 18 years and older with traumatic SCI (aligns with methodology used for national-level calculation [N = 24,816; Couris et al., 2010]).

*National rating according to persons aged 20 years and older (N = 84,235). The youngest age in the current study was 21 years old.

\(^1\)Implied Canadian prevalence (Wyndaele & Wyndaele, 2006).
Appendix D: Study 1 demographic differences in preferences and needs for videoconference use

D.1 Demographic differences in needs and barriers for videoconference use

<table>
<thead>
<tr>
<th>Variable</th>
<th>Needs &amp; barriers</th>
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<td>Age</td>
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<td>&lt;45 years</td>
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<td>4 (25.0)</td>
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<td>Years since injury</td>
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Note: Φ = Phi; PAG-SCI (yes) – meeting the aerobic and/or strength-training guidelines; PAG-SCI (no) – not meeting the aerobic or strength-training guidelines.

-- represents chi square results with an expected count less than 5.

*Power-assisted manual wheelchair (n=1).
### D.2 Demographic differences in preferences for videoconference use

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<tr>
<th>Variable</th>
<th>PAG-SCI status</th>
<th>Age</th>
<th>Years since injury</th>
<th>Injury level</th>
<th>Primary mode of mobility</th>
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<th>Group facilitator characteristics: SCI peer</th>
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<th>e-SMART session time*</th>
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<td>Primary mode of mobility</td>
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Note: φ = Phi; PAG-SCI (yes) – meeting the aerobic and/or strength-training guidelines; PAG-SCI (no) – not meeting the aerobic or strength-training guidelines.
*Preferred session time (11:00am-3:00pm)
**power-assisted manual wheelchair (n=1).
Appendix E: Study 2 eligibility criteria questionnaire

In the next 2 months (4 weeks for phase 2), would you be interested in adding a 20-minute bout of moderate-heavy intensity exercise (aerobic or strength-training) to my weekly routine.

Please tell me which of the following statements best describes you:

1) No → Non-intender – INELIGIBLE

2) Yes → Intender – ELIGIBLE
Appendix F: Study 2 baseline survey

This next question asks you about the time you spent engaging in leisure-time physical activity (LTPA) in the last 7 days. LTPA is physical activity that you choose to do during your free time, such as exercising, playing sports, gardening, and taking the dog for a walk (necessary physical activities such as physiotherapy, grocery shopping, pushing/wheeling for transportation are not considered LTPA). These are either AEROBIC activities, which increase heart rate and breathing, or STRENGTH TRAINING activities, which include lifting weights or using elastic resistance bands. The greatest fitness benefits can be achieved from regularly engaging in moderate to heavy intensity aerobic and strength-training LTPA.

- **Mild intensity** activity requires very light physical effort and makes you feel like you are working a little bit, but you can keep doing the activity for a long time without getting tired.

- **Moderate intensity** activity requires at least some physical effort and allows you to keep doing the activity for a while without getting tired.

- **Heavy intensity** LTPA makes you feel like you are working really hard, almost at your maximum. You cannot do this heavy intensity activity for very long without getting tired. These activities may be exhausting. During the last 7 days, on how many days did you do at least a 20-minute bout of aerobic LTPA at a MILD intensity? _____ days

During the last 7 days, how many days did you do at least a 20-minute bout of strength-training LTPA at a MILD intensity? _____ days

During the last 7 days, how many days did you do at least a 20-minute bout of aerobic LTPA at a moderate-heavy intensity? _____ days

During the last 7 days, how many days did you do at least a 20-minute bout of strength-training LTPA at a moderate-heavy intensity? _____ days
LTPA INTENTIONS

1. For the following question, please indicate how strongly you agree or disagree with the statement on a scale from strongly disagree, 1, to strongly agree, 7.

In the next 4 weeks, I intend on…

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

Adding one extra bout of moderate-heavy intensity exercise (aerobic or strength-training) for at least 20 minutes to my weekly routine. 1 2 3 4 5 6 7

PART B: VIDEOCONFERENCE SOCIAL COGNITIONS

VIDEOCONFERENCE OUTCOME EXPECTANCIES

To what extent do you think communication with others via videoconference would be:

Extreme  unenjoyable  1  2  3  4  5  6  7

Extremely harmful  1  2  3  4  5  6  7

Extremely unpleasant  1  2  3  4  5  6  7

Extremely bad  1  2  3  4  5  6  7

Extremely stressful  1  2  3  4  5  6  7

Extremely useless  1  2  3  4  5  6  7

Extremely enjoyable

Extremely beneficial

Extremely pleasant

Extremely good

Extremely relaxing

Extremely useful
VIDEOCONFERENCE INTENTIONS

For the following question, please indicate how strongly you agree or disagree with the statement on a scale from strongly disagree, 1, to strongly agree, 7.

In the future, I intend on…

Using videoconference to communicate with friends, family and other social networks. 1 2 3 4 5 6 7

Participating in other self-management group support programs delivered through videoconference.

TASK (VIDEOCONFERENCE) SELF-EFFICACY

Over the next 4 weeks, if you had all of the resources you needed, such as specialized equipment or an assistant, how confident are you that you could communicate with others via videoconference:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

Using videoconference to communicate with friends, family and other social networks. 1 2 3 4 5 6 7

Participating in other self-management group support programs delivered through videoconference. 1 2 3 4 5 6 7

VIDEOCONFERENCE BARRIER SELF-EFFICACY

For the following questions, please indicate how confident you are with each statement on a scale from 1 (not at all confident) to 7 (completely confident).

1. Assuming you were very motivated to communicate with others via videoconference, how confident are you that you could:
<table>
<thead>
<tr>
<th>(a) solve technical difficulties (i.e., Internet connection, audio or visual connection, etc) independently</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) solve technical difficulties (i.e., Internet connection, audio or visual connection, etc) if you had support from someone else</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Appendix G: Study 2 videoconference platform quality feedback survey (post-sessions)

Online survey: FluidSurveys

Time-point: following sessions 1, 2, 3, 4

Session date:

Thank you for your participation in the previous group session. We would appreciate it if you could take 2 minutes of your time to let us know how you perceived the quality and experience of the videoconference platform for the session date indicated above.

<table>
<thead>
<tr>
<th>Question</th>
<th>Excellent (5)</th>
<th>Good (4)</th>
<th>Average (3)</th>
<th>Poor (2)</th>
<th>Very Poor (1)</th>
<th>N/A (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>During today’s videoconference session, how would you rate…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the visual clarity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the sound clarity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the technical support?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ease of signing in and out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the ease of file sharing?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extremely easy</td>
<td>Easy</td>
<td>Neutral</td>
<td>Difficult</td>
<td>Extremely difficult</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------</td>
<td>------</td>
<td>---------</td>
<td>-----------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Overall, how easy was it to…</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>navigate through the videoconference platform?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>solve technical difficulties?</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix H: Study 2 group development check

**Participant understanding of the program content**

Online survey: FluidSurveys

*Two time-points*

**Time-point: following session 1**

**Instructions:**

Listed below are several questions that relate to the content discussed during the previous session.

Please indicate to what extent you agree or disagree with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The group discussions have inspired me to start thinking about the</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>benefits of adding an extra day of leisure-time physical activity into</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>my schedule.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My involvement in the group discussions has motivated me to add</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>an extra day of leisure-time physical activity into my schedule.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I found the information presented in the session to be easy to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>understand.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. The assigned homework will be useful for increasing my understanding of the importance of adding an extra day of leisure-time physical activity into my schedule.

5. Overall, I am satisfied with the content from this session.

**Time-point: following session 4**

**Instructions:**

Listed below are several questions that relate to the content discussed during the last 4 weeks.

Please indicate to what extent you agree or disagree with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found the self-monitoring strategy to be useful for adding an extra day of leisure-time physical activity into my schedule.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I found the goal-setting strategy to be useful for adding an extra day of leisure-time physical activity into my schedule.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I found the problem-solving strategy to be useful for adding an extra day of leisure-time physical activity into my schedule.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. My involvement in the group discussions has helped me understand the importance of using the strategies taught for planning an extra day of leisure-time physical activity into my schedule.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. I found the information presented in the program to be easy to understand.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. The homework assignments helped me understand how to add an extra day of leisure-time physical activity into my schedule.

7. Overall, I am satisfied with the content from the program.

**Participant perception of group environment: Group Cohesion**

**Online survey: FluidSurveys**

*Two time-points*

**Time-point: following sessions 1 and 4**

**Instructions:**

**Group name: __________________________**

When you answer the following questions think about how your group as a whole would respond. Your response should be based on what you believe your group would feel about these questions. Please indicate the extent to which you agree or disagree with the following statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My group helps to keep everyone motivated to achieve our group goal (i.e., add an extra day of leisure-time physical activity).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. My group helps motivate each of us to make extra leisure-time physical activity a part of our weekly routine.</td>
<td></td>
<td></td>
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<tr>
<td>3. Today’s group discussions have taught us that I can become more physically active once the program is over.</td>
<td></td>
<td></td>
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<tr>
<td>4. My group will be successful in carrying out more leisure-time physical activity once the program is</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
5. The content from today’s group discussions will be useful when we add an extra day of leisure-time physical activity.

Participant perception of group environment: Facilitator collaboration

Online survey: FluidSurveys

*Two time-points

Time-point: following sessions 1 and 4

Instructions:
Listed below are several questions that relate to your group facilitator and the relationship that you have formed with her in the previous session.

**This is NOT an evaluation of your facilitator.** It is simply what you felt occurred.

When you answer the following questions think about how your group as a whole would respond. Your response should be based on what you believe your group would feel about these questions.

Please indicate to what extent you agree or disagree with each statement by circling a response to each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel my group facilitator wants to know our opinions about adding an extra day of leisure-time physical activity into our daily lives.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Because of today’s discussions with my group facilitator, my group feels confident in meeting the program objectives once the program is</td>
<td></td>
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<td>---</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>My group facilitator encourages and works with the group so that each of us can plan and take responsibility for adding an extra day of leisure-time physical activity into our lives.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>I feel my group facilitator has worked together with us in building a program plan that will help meet each of our specific physical activity needs and goals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>My group facilitator cares about our health and about our opinions for developing our own goal for adding an extra day of leisure-time physical activity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix I: Study 2 research assistant checklist

UNIVERSITY OF TORONTO  
FACULTY OF KINESIOLOGY & PHYSICAL EDUCATION

Session 1

Standard protocol for each session:
Date: ____________________
Session start time: __________
Session end time: __________
Duration of session: __________ minutes

<table>
<thead>
<tr>
<th>Name</th>
<th>Attendance (circle)</th>
<th>Technical difficulty reason for absence?</th>
<th>Video chat or audio only (circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>2.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>3.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>4.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>5.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>6.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
</tbody>
</table>
### Check (Tally) sheet: Group collaboration indicators

<table>
<thead>
<tr>
<th>Sharing (how are participants communicating?)</th>
<th>Social norms (descriptive and injunctive: what are the standard rules/perceived behaviours and expectations that come from communication?)</th>
<th>Strategies (‘applications of purpose’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>Opinion</td>
<td>Problem solve</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------------</td>
</tr>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Check (Tally Sheet): Group interruptions

<table>
<thead>
<tr>
<th>Participant interjection (for the purpose of providing input)</th>
<th>External source of interruption (i.e., Family, pets, personal support worker, telephone, doorbell)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Session 2**

**Standard protocol for each session:**

Date: _______________
Session start time: __________
Session end time: __________
Duration of session: __________ minutes

**Participant attendance**

<table>
<thead>
<tr>
<th>Name</th>
<th>Attendance (circle)</th>
<th>Technical difficulty reason for absence?</th>
<th>Video chat or audio only (circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>2.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>3.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>4.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>5.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>6.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
</tbody>
</table>
Check (Tally) sheet: Group collaboration indicators

<table>
<thead>
<tr>
<th>Experience</th>
<th>Opinion</th>
<th>Problem solve</th>
<th>Pass</th>
<th>Common</th>
<th>Unique</th>
<th>Positive feedback</th>
<th>Screen sharing</th>
<th>File sharing</th>
<th>Text messaging</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.E*</td>
<td>PA**</td>
<td>0.E*</td>
<td>Videoconference platform</td>
<td>Videoconference platform</td>
<td>Other</td>
</tr>
</tbody>
</table>

*O.E=Outcome expectations

**PA=Physical activity

Check (Tally Sheet): Group interruptions

<table>
<thead>
<tr>
<th>Participant interjection (for the purpose of providing input)</th>
<th>External source of interruption (i.e., Family, pets, personal support worker, telephone, doorbell)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check (Tally Sheet): Post-session application

<table>
<thead>
<tr>
<th>Skills training exercise completed (Shared perceived PA benefits)</th>
<th>Buddy System</th>
<th>Mode of communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-on-one</td>
<td>Group</td>
<td>Videoconference</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telephone</td>
</tr>
</tbody>
</table>
### Session 3

**Standard protocol for each session:**

- **Date:** ___________________
- **Session start time:** __________
- **Session end time:** __________
- **Duration of session:** __________ minutes

#### Participant attendance

<table>
<thead>
<tr>
<th>Name</th>
<th>Attendance (circle)</th>
<th>Technical difficulty reason for absence?</th>
<th>Video chat or audio only (circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>2.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>3.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>4.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>5.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>6.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
</tbody>
</table>

#### Check (Tally) sheet: Group collaboration indicators

<table>
<thead>
<tr>
<th>Sharing (how are participants communicating?)</th>
<th>Social norms (descriptive and injunctive; what are the perceived behaviours and expectations expressed?)</th>
<th>Strategies ('applications of purpose')</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
<td>Opinion</td>
<td>Problem solve</td>
</tr>
<tr>
<td>PA behaviour</td>
<td>PA barriers</td>
<td>PA goals</td>
</tr>
</tbody>
</table>
*The personal exercise item brought to the session (i.e., resistance band)

Check (Tally Sheet): Group interruptions

<table>
<thead>
<tr>
<th>Participant interjection (for the purpose of providing input)</th>
<th>External source of interruption (i.e., Family, pets, personal support worker, telephone, doorbell)</th>
</tr>
</thead>
</table>

Check (Tally Sheet): Post-session application

<table>
<thead>
<tr>
<th>Skills training exercise completed</th>
<th>Buddy System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared self-monitoring results</td>
<td></td>
</tr>
<tr>
<td>Shared an exercise item</td>
<td></td>
</tr>
<tr>
<td>One-on-one</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td></td>
</tr>
<tr>
<td>Mode of communication</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shared self-monitoring results</th>
<th>Shared an exercise item</th>
<th>One-on-one</th>
<th>Group</th>
<th>Mode of communication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Videoconference</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Email</td>
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<td></td>
<td>Telephone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>

Session 4

Standard protocol for each session:

Date: __________
Session start time: __________
Session end time: __________
Duration of session: __________ minutes

Participant attendance

<table>
<thead>
<tr>
<th>Name</th>
<th>Attendance (circle)</th>
<th>Technical difficulty reason for absence?</th>
<th>Video chat or audio only (circle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
</tr>
<tr>
<td>2.</td>
<td>[Present] or [Absent]</td>
<td>[Yes] or [No] Other reason:</td>
<td>[Video] or [Audio]</td>
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<tr>
<td>3.</td>
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<td>[Video] or [Audio]</td>
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</table>
Check (Tally sheet): Group collaboration indicators

<table>
<thead>
<tr>
<th>Sharing (how are participants communicating?)</th>
<th>Social norms (descriptive and injunctive; what are the perceived behaviours and expectations expressed?)</th>
<th>Strategies (‘applications of purpose’)</th>
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<tbody>
<tr>
<td>Experience</td>
<td>Opinion</td>
<td>Problem solve</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>----------------</td>
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<tr>
<td>PA behaviour</td>
<td>PA behaviour</td>
<td>Self-monitoring cues</td>
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Check (Tally Sheet): Group interruptions

<table>
<thead>
<tr>
<th>Participant interjection (for the purpose of providing input)</th>
<th>External source of interruption (i.e., Family, pets, personal support worker, telephone, doorbell)</th>
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</thead>
</table>

Check (Tally Sheet): Post-session application

<table>
<thead>
<tr>
<th>Skills training exercise completed</th>
<th>Buddy System</th>
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</thead>
<tbody>
<tr>
<td>Shared PA experiences</td>
<td>Individual goal achieved</td>
</tr>
<tr>
<td>Group goal achieved</td>
<td>One-on-one</td>
</tr>
<tr>
<td>Group</td>
<td>Mode of communication</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Videoconference</td>
</tr>
<tr>
<td></td>
<td>P1</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td><strong>Troubleshooting:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Issue #1</strong></td>
<td>Start time: _____</td>
</tr>
<tr>
<td><strong>Mode of communication</strong></td>
<td>Skype audio</td>
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</table>

- Email
- Telephone
- Other
<table>
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<th><strong>Solution</strong></th>
<th><strong>Pause</strong></th>
<th><strong>Pause</strong></th>
<th><strong>Pause</strong></th>
<th><strong>Pause</strong></th>
<th><strong>Pause</strong></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Re-join</td>
<td>Re-join</td>
<td>Re-join</td>
<td>Re-join</td>
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<tr>
<td></td>
<td>Re-connect Skype</td>
<td>Re-connect Skype</td>
<td>Re-connect Skype</td>
<td>Re-connect Skype</td>
<td>Re-connect Skype</td>
</tr>
<tr>
<td></td>
<td>Shut down computer and re-connect</td>
<td>Shut down computer and re-connect</td>
<td>Shut down computer and re-connect</td>
<td>Shut down computer and re-connect</td>
<td>Shut down computer and re-connect</td>
</tr>
<tr>
<td></td>
<td>Turn off web cam</td>
<td>Turn off web cam</td>
<td>Turn off web cam</td>
<td>Turn off web cam</td>
<td>Turn off web cam</td>
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<tr>
<td></td>
<td>Close other computer programs or devices (type)</td>
<td>Close other computer programs or devices (type)</td>
<td>Close other computer programs or devices (type)</td>
<td>Close other computer programs or devices (type)</td>
<td>Close other computer programs or devices (type)</td>
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<tr>
<td></td>
<td>Other:________</td>
<td>Other:________</td>
<td>Other:________</td>
<td>Other:________</td>
<td>Other:________</td>
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<tr>
<td></td>
<td>Quit session</td>
<td>Quit session</td>
<td>Quit session</td>
<td>Quit session</td>
<td>Quit session</td>
</tr>
</tbody>
</table>

| **Total number of issues (total duration)** |          |          |          |          |          |
| **Grand Total Number of Issues (Total Duration)** |          |          |          |          |          |
Appendix J: Study 2 program follow-up survey

PART A: LEISURE-TIME PHYSICAL ACTIVITY (LTPA) BEHAVIOUR

This next question asks you about the time you spent engaging in leisure-time physical activity (LTPA) in the last 7 days. LTPA is physical activity that you choose to do during your free time, such as exercising, playing sports, gardening, and taking the dog for a walk (necessary physical activities such as physiotherapy, grocery shopping, pushing/wheeling for transportation are not considered LTPA). These are either AEROBIC activities, which increase heart rate and breathing, or STRENGTH TRAINING activities, which includes lifting weights or using elastic resistance bands. The greatest fitness benefits can be achieved from regularly engaging in moderate to heavy intensity aerobic and strength-training LTPA.

Mild intensity activity requires very light physical effort and makes you feel like you are working a little bit, but you can keep doing the activity for a long time without getting tired.

Moderate intensity activity requires at least some physical effort and allows you to keep doing the activity for a while without getting tired.

Heavy intensity LTPA makes you feel like you are working really hard, almost at your maximum. You cannot do this heavy intensity activity for very long without getting tired. These activities may be exhausting. During the last 7 days, on how many days did you do at least a 20-minute bout of aerobic LTPA at a MILD intensity? _______ days

During the last 7 days, on how many days did you do at least a 20-minute bout of strength-training LTPA at a MILD intensity? _______ days

During the last 7 days, on how many days did you do at least a 20-minute bout of aerobic LTPA at a moderate-heavy intensity? _______ days

During the last 7 days, on how many days did you do at least a 20-minute bout of strength-training LTPA at a moderate-heavy intensity? _______ days
LTPA INTENTIONS

For the following question, please indicate how strongly you agree or disagree with the statement on a scale from strongly disagree, 1, to strongly agree, 7.

In the next 4 weeks, I intend on…

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

Adding one extra bout of moderate-heavy intensity exercise (aerobic or strength-training) for at least 20 minutes to my weekly routine.

PART B: VIDEOCONFERENCE SOCIAL COGNITIONS

VIDEOCONFERENCE PLATFORM QUALITY FEEDBACK SURVEY (OVERALL EXPERIENCE)

The following three questions are designed to gain further insight into your experience while participating in the videoconference sessions of the e-SMART program. Your responses will contribute to the successful delivery of future videoconference-based PA support programs for individuals with spinal cord injury.

1) Please indicate up to 3 positive aspects of the videoconference tutorial sessions (i.e., the 20-minute one-on-one session with the group facilitator, and the interactive tutorial during the first group session.

2) Please indicate up to 3 negative aspects of the videoconference tutorial sessions (i.e., the 20-minute one-on-one session with the group facilitator, and the interactive tutorial during the first group session.

3) Please list up to 3 positive aspects of your videoconference experience over the 4-week e-SMART program.

4) Please list up to 3 negative aspects of your videoconference experience over the 4-week e-SMART program.

5) Please explain how you were able to solve any issues related to operating the videoconference software (if applicable).

6) Please list up to 2 recommendations that you would provide us with to further enhance the videoconference experience (e.g. alternative videoconference platform).
VIDEOCONFERENCE OUTCOME EXPECTANCIES

To what extent do you think communication with others via videoconference would be:

- **Extremely unenjoyable**
- **Extremely enjoyable**
- **Extremely harmful**
- **Extremely beneficial**
- **Extremely unpleasant**
- **Extremely pleasant**
- **Extremely bad**
- **Extremely good**
- **Extremely stressful**
- **Extremely relaxing**
- **Extremely useless**
- **Extremely useful**

VIDEOCONFERENCE INTENTIONS

1. For the following question, please indicate how strongly you agree or disagree with the statement on a scale from strongly disagree, 1, to strongly agree, 7. In the future, I intend on…

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using videoconference to communicate with friends, family and other social networks. 1 2 3 4 5 6 7
Participating in other self-management group support programs delivered through videoconference. 1 2 3 4 5 6 7

TASK (VIDEOCONFERENCE) SELF-EFFICACY

1. Over the next 4 weeks, if you had all of the resources you needed, such as specialized equipment or an assistant, how confident are you that you could communicate with others via videoconference:

<table>
<thead>
<tr>
<th>Not Confident At All</th>
<th>Completely Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

VIDEOCONFERENCE BARRIER SELF-EFFICACY

For the following questions, please indicate how confident you are with each statement on a scale from 1 (not at all confident) to 7 (completely confident).

2. Assuming you were very motivated to communicate with others via videoconference, how confident are you that you could:

<table>
<thead>
<tr>
<th>Not Confident At All</th>
<th>Completely Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) solve technical difficulties (i.e., Internet connection, audio or visual connection, etc) independently</td>
<td>1</td>
</tr>
<tr>
<td>(b) solve technical difficulties (i.e., Internet connection, audio or visual connection, etc) if you had support from someone else</td>
<td>1</td>
</tr>
</tbody>
</table>

PART C: PROGRAM FEASIBILITY

Time

1. I had enough time to familiarize myself with the videoconference platform. (strongly disagree (1) to strongly agree (5))

2. I had enough time to build a relationship with my group members. (strongly disagree (1) to strongly agree (5))
3. I had enough time to practice the physical activity strategies (e.g., self-monitoring and goal-setting). (strongly disagree (1) to strongly agree (5))

4. I had enough time to achieve my physical activity goal by the last session. (strongly disagree (1) to strongly agree (5))

Space

1. I believe that participating in this group program over the Internet has empowered me to take control of my active lifestyle. (strongly disagree (1) to strongly agree (5))

2. I was able to recognize my peer’s nonverbal cues (i.e., facial expressions, eye contact, body posture, and tone of voice) during the group sessions. (strongly disagree (1) to strongly agree (5))

3. The verbal interruptions made by my participants were distracting? (strongly disagree (1) to strongly agree (5))

Strategies

1. The one-on-one videoconference tutorial and manual was very useful. (strongly disagree (1) to strongly agree (5))

2. The screen sharing activities motivated me to contribute to group activities. (strongly disagree (1) to strongly agree (5))

3. The private group discussions were very useful. (strongly disagree (1) to strongly agree (5))

4. The text-messaging feature encouraged the group to participate in the goal-setting lesson. (strongly disagree (1) to strongly agree (5))

5. Describe any concerns that you had with any of these videoconference features (screen sharing, private discussions, text-messaging or file sharing)

6. I believe that communicating with my group members between sessions (i.e., ‘the Buddy System’) helped increase my understanding of the session content. (strongly disagree (1) to strongly agree (5), or N/A)

7. I believe that communicating with my group members between sessions (‘Buddy System’) helped increase my motivation to meet my physical activity goal. (strongly disagree (1) to strongly agree (5) or N/A)

8. If you did not participate in the ‘Buddy System’, please explain why.

PROGRAM ACCEPTABILITY

Level of enjoyment

1. I enjoyed being a member of my group. (strongly disagree (1) to strongly agree (5))

2. Overall, I enjoyed participating in the group discussions and activities. (strongly disagree (1) to strongly agree (5))

3. I enjoyed the group videoconference tutorial lesson. (strongly disagree (1) to strongly agree (5))

PROGRAM USEFULNESS
Usability:

Perceived ease of use

1. Overall, the videoconference platform was easy to operate. (strongly disagree (1) to strongly agree (5))
2. It was easy and quick to learn how to operate the videoconference platform. (strongly disagree (1) to strongly agree (5))
3. The screen sharing feature was easy to operate. (strongly disagree (1) to strongly agree (5))
4. The file sharing feature was easy to operate. (strongly disagree (1) to strongly agree (5))
5. The text messaging interface was easy to operate. (strongly disagree (1) to strongly agree (5))
6. It was easy to connect to and disconnect from the videoconference platform. (strongly disagree (1) to strongly agree (5))
7. It was easy to join the Skype© group calls. (strongly disagree (1) to strongly agree (5))

Utility:

Functionality

1. To what extent had the program taught you the skills necessary to operate a videoconference platform? (1 = not at all to 5 = to a very great extent)
2. To what extent has this program taught you the skills to INCREASE your physical activity behaviour? (1 = not at all to 5 = to a very great extent)
3. To what extent did the program help you meet your physical activity goals? (1 = not at all to 4 = to a very great extent)
4. To what extent did the program help you build social relationships? (1 = not at all to 4 = to a very great extent)
5. To what extent did the program meet your technical support needs? (1 = not at all to 4 = to a very great extent)

User satisfaction

1. What is your overall satisfaction with the e-SMART program? (1 = very satisfied to 5 = very dissatisfied)
2. To what extent has the e-SMART program met your learning expectations (1 = very satisfied to 5 = very dissatisfied)
3. To what extent do you feel satisfied with the self-monitoring lesson? (1 = very satisfied to 5 = very dissatisfied)
4. To what extent do you feel satisfied with the goal-setting lesson? (1 = very satisfied to 5 = very dissatisfied)
5. To what extent do you feel satisfied with the problem-solving lesson? (1 = very satisfied to 5 = very dissatisfied)
6. How well did this online interaction compare with the typical face-to-face group interaction? (1 = very similar to 5 = very different)
Additional feedback:

1. Do you have any further feedback for improving future videoconference-delivered physical activity support programs?
## Appendix K: Summary of study 2 measure assessments and the time-points

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Baseline</th>
<th>4-week e-SMART program</th>
<th>Follow-Up assessment*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Information</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Program Feasibility/Fidelity</td>
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<tr>
<td>Objective measures</td>
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<td></td>
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<tr>
<td>Adherence (number of tasks completed)</td>
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<tr>
<td>Dosage (session and sections)</td>
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<td>Delivery quality (# of interruptions)</td>
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<td>X</td>
<td></td>
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</tbody>
</table>

*Follow-up questionnaire administered 24 hours following the completion of the 4th session assessment.
V/C = videoconference.
LTPA = leisure-time physical activity.
Appendix L: e-SMART participant activity manual

UNIVERSITY OF TORONTO
FACULTY OF KINESIOLOGY & PHYSICAL EDUCATION

Samantha Jeske, University of Toronto

Kelly Arbour-Nicitopoulos, University of Toronto

Adapted from ‘RAMP UP Participant Activity Manual’ (Brawley, Arbour-Nicitopoulos & Martin Ginis, 2013)
Welcome to the e-SMART program! The objective of this program is to provide you with a set of tools that will help you increase your physical activity. These tools include self-monitoring, goal-setting and problem solving. Over the next 4 weeks, you will be learning how to apply these tools through group-based discussions with fellow SCI peers delivered over Skype®. This program is being facilitated by Samantha Jeske, a second year Masters student studying Exercise Science at the University of Toronto.
Session 1:

Objectives:

At the end of this session, you should be able to…

- Navigate through Skype® with greater ease.
- Identify the common goal of your group.
The Wheel of Group Identity

- List some unique characteristics about yourself in one of the outer spaces of the wheel.

- List some common characteristics that your group shared in the centre of the wheel
Netiquette: Ground Rules

Golden rule: “Treat others the way you want to be treated.”

i. The facilitator will initiate each Skype® call and be the last person to end the Skype® call;

ii. The group facilitator and participants will communicate with respectful language;

iii. The group facilitator will not prescribe a specific exercise plan or provide advice for mental and/or physical illness;

iv. The role of the group facilitator is to guide group discussions and ensure the group is progressing towards the program goal;

v. Only one person should be speaking at a time;

vi. Group members should signal that they would like to speak by raising their hand in front of the web cam or by sending a text message in the conversation.

vii. The group facilitator will make an audible noise to signal the current person speaking to wrap-up in one minute;

viii. All content recorded from the sessions for future analyses will maintain strict confidentiality.
Videoconference Tutorial Guide

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<th>Page #</th>
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</thead>
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</tr>
<tr>
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<td>2</td>
</tr>
<tr>
<td>Download Skype</td>
<td>3</td>
</tr>
<tr>
<td>Check your audio and video settings</td>
<td>4</td>
</tr>
<tr>
<td>Personalize your Skype profile</td>
<td>5</td>
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<tr>
<td>Set general and privacy settings</td>
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<td>Making status updates</td>
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<td>Add your contacts</td>
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<td>Making Skype calls</td>
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<td>- How to initiate…</td>
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<td>- How to use Skype features:</td>
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Introduction
This manual will give you an overview of how to Get Started with Skype. There are many features offered in Skype, but this manual will only outline the necessary features for participating in the e-SMART videoconference program.

Things you will need:

1. Internet connection
2. Speakers
3. Microphone
4. Webcam

*The instructions are tailored to both Mac and Windows users.
Sign up

To create a Skype account, visit the Skype homepage (http://www.skype.com/en/) and click Download Skype or Get Skype in the upper right hand corner.

Note: There is a separate download link for Windows and Mac users (see image below).

Download Skype

You will have the option to purchase Skype® credits. This is completely optional. For the purpose of the e-SMART program, this manual will give a Getting Started overview of making free Skype® group video calls.
*Windows users:*

1. Save the Skype® Setup Application file.
2. Double-click the Skype® Setup file and follow the installation instructions.
3. To open Skype®, launch the Skype® application and log in with your Skype® name and password.

*Mac users:*

1. Save the Skype® download file.
2. A Finder window should appear.
3. Double-click the download file and drag the Skype® icon to your Application folder.
4. To open Skype®, click on the file in your Application folder.
5. Log in with your Skype® name and password.

![Skype login screen](image)

**Log-in preference:**

You have the option to log-in with a separate Skype® account (click ‘Create an account’) or with an already existing Facebook or Microsoft account.

**First time logging in to your Skype® account:**
Select your preferred Skype® settings, such as, language and automatic Skype launch during computer start-up.

*Note: The 'Click to Call' feature is completely optional and is not going to be used during the e-SMART program.*

* Skype® will take a few minutes to install.

**Check your audio and video settings**

You will have the option to check your audio and video settings during Skype® setup. The following instructions will guide you through this step if you wish to do so after your setup is complete.

**Windows users:**

1. Click ‘Call’
2. Click ‘Audio settings’
3. Click Video settings*
Mac users:

1. Click ‘Skype®’ at the upper left-hand corner
2. Scroll down to ‘Preferences’
3. Click on the Audio/Video’ button

Important things to look for on the settings page:

- Speakers should be turned on: You should hear a Skype® jingle
- Choose your microphone from the drop-down menu. If your microphone is activated, you will notice waves moving.
- Ensure your webcam is plugged in (check video settings). You should be able to see yourself on the live video feed.

Set up your profile

You can add as much or as little information as you want.

Change profile picture:

If you didn’t add a profile picture during the setup process, you can still have the chance to do so if you wish.

1. Click on your name on the upper left hand corner and all your profile settings will appear.
   - You can edit other personal information here, as well (e.g., email address).

2. You can control who can see your personal information.
   - On the right hand column of the profile edit window, you can choose 3 privacy settings for each of the personal information fields (e.g., ‘Public’ (open to all Skype users), ‘Contacts only’, ‘Private’ (only visible to you)).
   - Note: there may be some fields that are grayed, meaning that you can’t control privacy for this information.

Set general and privacy settings
Mac users:

1. Click “Skype®” at the upper left-hand corner
2. Select “Preferences.”
3. Settings displayed on the top of the window.

For Windows users:

1. Click “Skype®” at the upper left-hand corner of the menu bar
2. Select “Privacy.”
3. You’ll find a Categorized list of settings on the left-hand side of the menu.

General tab:

- Can choose to double-click on a contact to start a call, enable Skype® to launch when your computer starts and more.

Privacy tab:

- Avoid unwanted calls and instant messages (IMs) by selecting the appropriate settings
- You can choose who can call and IM you, who can send videos and share screens with you, who can see your online status, and how long you want your chat history to stay.
- If you don’t want your profile details to be shared with advertisers, do not check off "Allow Microsoft targeted ads, including use of
Skype® profile age and gender."

- You can also manage your blocked people under "Block contacts."

Notifications tab:

Choose which Skype® alerts you want to receive.

Additional tabs: Calls, IM & SMS (Messaging) and Advanced

Setting your status

You can let your Skype® contacts know if you’re available to chat. The status (e.g., Online, away, do not disturb, invisible, online) that you
choose will display beside your name.

Windows users:

1. Click ‘Skype®’ on the left-hand side of the menu bar (top of the Skype® window)

2. Select Online Status’

Mac users:

1. Click ‘File’

2. Click ‘Change status’
Add your contacts

Homepage: "Find your friends and say hello."

You can search for your Skype® contacts in your address book by selecting “Search address book.”
Manual Skype contact invitation:

1. Tap the "Add Contacts" button
2. Enter your contact's name, Skype® name or email address
3. Select the contact from the list of results that appear
4. Tap "Add to Contacts."
5. You can edit the default contact request message
6. Click "Send."
7. Approved contacts will appear in your Contacts List.
8. Online or available status: green check mark beside contact name

Message, call and video chat contacts

Initiate a conversation: click on a contact in your list

1. Send and receive instant messages by typing in the text field
2. Send file by click the + button > select "Send file..." > browse and choose the file you want to send > Click "Open"
3. Screen share by Click the + button > select "Share screens..." > group members will automatically see what’s on your screen> when done select stop sharing or end call
4. You can easily turn on or off the microphone and/or webcam during a call on the bottom of the visual screen.
5. End a conversation by clicking the red "end call" button.
*File sharing:* you can share photos, videos and files free of charge. There is no size limit or limit to the number of files you can send or receive through Skype®. Ensure that you are using an up-to-date antivirus software to scan files that are sent to you.

**Messaging:** Skype to Skype® calls

**Audio call:** click the "Call Phone" button next to your contact's name.

**Video chat**

**Mac users:**

1. Both people need to have webcams activated

2. Hover over your contact’s profile picture

3. Click “Video Call”.

**Windows users:**
1. Click on the "Video Call" button (left hand side of the call button).

**Group video calls (up to 25 people)**

**Mac users:**

1. Click "File,"
2. "New Conversation"
3. Click the + button
4. Click ‘Add People’ to the group call.

**Windows users:**

1. Click the "Create a Group" button
2. Click on a contact you want to add to the group and drag it to space labeled "Drag contacts that you want to add here."

OR

1. Click the + button
2. Select "Add people."
Getting to know your group

Time to brainstorm group names!

Common characteristics of our group:

- Everyone in our group is aiming to include an extra bout of physical activity per week!
- 
- 
- 

My e-SMART Buddy is…

1. 
2. 
3. 
4. 
5. 
Session 2:

Objectives:

At the end of this session, you should be able to…

- Identify your motivation(s) for increasing your weekly physical activity.
- Recognize the benefits of increasing your weekly physical activity.
- Understand how to self-monitor your physical activity level (i.e., using an inactivity log).
Myth or Reality

1. A regular physical activity routine is best established when joining a gym or sports facility.

2. Physical activity requires special equipment.

3. I need to set a time to be physically active.

4. It’s dangerous to start increasing my physical activity as I get older.

5. No pain, no gain
Tipping the balance: Weighing the pros and cons of doing physical activity

Now, let's brainstorm some of the benefits of increasing our physical activity (both short-term and long-term)! Which benefits do YOU believe that you personally will get from increasing physical activity?

Pro or Con?

- __________________________
- __________________________
- __________________________
- __________________________
- __________________________

- __________________________
- __________________________
- __________________________
- __________________________
- __________________________
Physical Activity Self-monitoring Inactivity Log

My physical activity goal is....

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

The purpose of this activity is to identify certain periods of time when we are inactive (e.g., watching television, using the computer, talking on the phone), but could engage in physical activity.

Below is an example of my 24-hr log with boxes shaded, representing 1-hr blocks of time when my inactive periods of time can be spent moving my body and releasing ‘feel-good’ endorphins!

INACTIVITY LOG: EXAMPLE

<table>
<thead>
<tr>
<th>DAY:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</table>
WHEN CAN I FIT IN PHYSICAL ACTIVITY INTO MY WEEK…

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</table>
Session 3:

Objectives:

At the end of this session, you should be able to…

- Understand the principles of S.M.A.R.T. goal-setting and how to apply these principles into your physical activity planning.
- Understand how to apply the F.I.T.T. principles while creating your S.M.A.R.T. individual and group physical activity goals.
INDIVIDUAL GOAL

The type of activity I will do this week is: ________________________

I will complete _____ minutes of this activity.

Let's add up our individual goals to create a group goal for the amount of time we will exercise independently this week!

GROUP GOAL

The group goal is: ________ minutes

Let's look back at our inactivity logs. Through developing a plan for when to engage in physical activity, we are more likely to achieve our goal.

When will I schedule my activity this week? ________________________

Check-in with your buddy this week and remind each other of your physical activity.
SMART Goal-Setting

**SPECIFIC**
- What kind of exercise(s) do you want to be able to do without experiencing pain or discomfort?
- How long and intense do you want to be able to perform this task?
- What is the level of intensity that you want to achieve?

**MEASURABLE**
- Can you quantify your exercise progress?
- Example: After 1 week, you have increased your hand-cycling training to 2 minutes, or you increased your bicep curl weight by 5 pounds.

**ATTAINABLE**
- Does your current health condition allow you to achieve this goal under the pre-determined time-frame?
- It is recommended that you seek physical exercise advice from your physiotherapist, or another qualified health care professional.

**REALISTIC**
- Is your goal safe yet challenging enough to produce progress?

**TIME-SPECIFIC**
- When do you expect to achieve your goal?

---

**Step 1: Write Down Your ‘Long-Term’ Goal**

What is a ‘long-term’ goal?

- A physical task that you find important but very challenging to complete.

- It can be a typical activity that you encounter on a regular basis
  - Travelling to work or entertaining your children/grandchildren.

- It can be a fitness-specific task
  - Increasing your shoulder range of motion or maximum strength for the chest press exercise.

- It is expected that you achieve this physical task by the end of the intervention.
Step 2: Write Down Your ‘Short-Term’ Goal(s)

What are ‘short-term’ goals?

- Physical exercises that you plan to do on a regular basis (see below: Weekly Goals)
- These exercises should help you achieve your ‘long-term’ goal.
- For example, you may choose to practice your wheeling endurance (i.e. wheeling along the trail or hand-cycling) in order to enhance your aerobic capacity for everyday activities (i.e. wheeling to the bank or playing with your children/grandchildren).

Note: After recording your goal(s) (long-term and short-term)…

1. Write down how confident or certain you feel that you can achieve this goal on a scale from 0 (not at all confident) to 10 (completely confident).
2. Prepare for any challenges or barriers to attaining this goal (i.e. lack of time or pain)
3. Write down how you plan to overcome these barriers (i.e. exercising with a workout buddy or using imagery to control your pain)

Step 1: Long term goal

Physical activity task: ____________________________________________

Confidence (0-1): __________

Do you foresee any challenges or barriers to your upcoming week’s goal? Explain how this can be overcome/prevented?

____________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________

__
Step 2: Short term (weekly) goal(s)

Aerobic exercise:

Type of exercise: _____________________________________________________________

Confidence (0-1): ____________

Do you foresee any challenges or barriers to your upcoming week’s goal? Explain how this can be overcome/prevented?

____________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________

Strength exercise

Type of exercise: _____________________________________________________________

Confidence (0-1): ____________

Do you foresee any challenges or barriers to your upcoming week’s goal? Explain how this can be overcome/prevented?

____________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________

Stretching/range of motion exercise

Type of exercise: _____________________________________________________________

Confidence (0-1): ____________

Do you foresee any challenges or barriers to your upcoming week’s goal? Explain how this can be overcome/prevented?

____________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________
Step 3: Quantifying your goal(s)

A successful goal requires measurable indicators of improvement. Every day you should record the frequency, duration and intensity of each exercise you do (see FITT principle below). These values will help you monitor your functional capacity. Before you can start working on your short-term goals, you must ensure that your exercise plan is challenging but also realistic and safe. Perform your exercise(s) and determine how often (or how far) you can perform this activity without excessive pain.

**F**requency
- How many times per week or day will you perform this exercise?

**I**ntensity
- How much physical effort are you putting into the exercise?
  - Light effort: You should feel a little bit of work but overall you should not have the feeling of working too hard.
  - Moderate effort: The activity should be hard to perform but you should feel able to continue this effort for a long time.
  - Vigorous effort: The activity should be hard to perform (almost to your maximum) and you can not perform this activity for a short period before being tired. These activities can be exhausting.

**T**ype
- What kind of aerobic and strengthening exercises would you like to do?

**T**ime
- How long are your exercise bouts?
- How many repetitions and sets for each strengthening exercise?
- How long are your rest breaks between strengthening sets?

Exercise 1: Aerobic

Type of exercise: ________________________________________________________

Duration (min): ________________________________________________________

Repetitions: ________________________________________________________

Frequency (daily/weekly): ________________________________________________________

Intensity (low, moderate vigorous): ________________________________________________________

Exercise 2: Strength

Type of exercise: ________________________________________________________

Duration (min): ________________________________________________________

Repetitions: ________________________________________________________
Exercise 3: Stretching/Range of Motion

Type of exercise: ____________________________________________________________

Duration (min): ____________________________________________________________

Repetitions: ______________________________________________________________

Frequency (daily/weekly): __________________________________________________

Intensity (low, moderate vigorous): __________________________________________

Frequency (daily/weekly): __________________________________________________

Intensity (low, moderate vigorous): __________________________________________
Step 4: Start your exercise routine at a reasonable intensity

The intensity of your first day of exercise should be 20% below your maximum effort without experiencing excessive pain. It is expected that you increase the intensity of your exercise by 10% every three days.

Example:

Maximum lateral raises 10 repetitions

First day: 8 lateral raises

Second day: 8 lateral raises

Third day: 9 lateral raises

My first day of exercise

Exercise 1: Aerobic

Type of exercise: ________________________________________________________

Duration (min): __________________________________________________________

Repetitions: ____________________________________________________________

Frequency (daily/weekly):_________________________________________________

Intensity (low, moderate vigorous): _______________________________________

Exercise 2: Strength

Type of exercise: _______________________________________________________

Duration (min): _________________________________________________________

Repetitions: _____________________________________________________________
Exercise 3: Stretching/Range of Motion

Type of exercise: ____________________________________________________________

Duration (min): ____________________________________________________________

Repetitions: ________________________________________________________________

Frequency (daily/weekly): ____________________________________________________

Intensity (low, moderate vigorous): ____________________________________________

Note: If you find that your first day of exercise is too challenging, you may reduce the intensity level (i.e. repetitions or duration) by 20%
## Sample Exercises

### Aerobic Exercises:

**Recommendation - minimum bout duration of 20 minutes**

<table>
<thead>
<tr>
<th>Individual</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Wheeling</td>
<td>- Softball or throw the baseball around with family or friends</td>
</tr>
<tr>
<td>- Swimming</td>
<td>- Rugby</td>
</tr>
<tr>
<td>- Cycling/arm ergometer</td>
<td>- Tennis</td>
</tr>
<tr>
<td>- Speed bag punches</td>
<td>- Curling</td>
</tr>
<tr>
<td>- Row machine</td>
<td>- Basketball</td>
</tr>
<tr>
<td></td>
<td>- Sledge hockey</td>
</tr>
<tr>
<td></td>
<td>- Dance</td>
</tr>
</tbody>
</table>

### Strengthening Exercises:

**Recommendation - 8-10 repetitions, 3 sets of each exercise**

<table>
<thead>
<tr>
<th>Individual</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Resistance bands, cable pulleys, or free weights (can be a household item such as food cans):</td>
<td>- Circuit fitness classes</td>
</tr>
<tr>
<td>❖ Bicep and tricep curls</td>
<td>- Yoga</td>
</tr>
<tr>
<td>❖ Seated row</td>
<td>- Pilates</td>
</tr>
<tr>
<td>❖ Wide grip latissimus pull downs</td>
<td>- Tai chi</td>
</tr>
<tr>
<td>❖ Chest flies</td>
<td></td>
</tr>
<tr>
<td>❖ Seated dip</td>
<td></td>
</tr>
<tr>
<td>❖ Shoulder or chest press</td>
<td></td>
</tr>
</tbody>
</table>
Stretching Exercises:

Recommendation: minimum 5 second hold, 5 sets of each exercise

<table>
<thead>
<tr>
<th>Individual</th>
<th>Group or Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>❖ Forward bend (may place cushion on lap for comfort)</td>
<td>❖ Back stretch (arms extended during forward bend)</td>
</tr>
<tr>
<td>❖ Backward bend</td>
<td>❖ Chest stretch (arm laterally extended)</td>
</tr>
<tr>
<td>❖ Side bends</td>
<td>❖ Side bend pull</td>
</tr>
<tr>
<td>❖ Shoulder shrugs</td>
<td></td>
</tr>
<tr>
<td>❖ Neck side bends</td>
<td></td>
</tr>
<tr>
<td>❖ Chin tucks</td>
<td></td>
</tr>
<tr>
<td>❖ Posterior shoulder blade stretch</td>
<td></td>
</tr>
<tr>
<td>❖ Knee tuck (middle of chest and shoulder directions)</td>
<td></td>
</tr>
</tbody>
</table>
Session 4:

Objectives:

At the end of this session, you should be able to…

- Evaluate your success at setting and achieving the previous week’s individual and group goals.
- Identify personal barriers to physical activity.
- Learn how to overcome personal barriers to physical activity.
- Continue to develop your self-monitoring and S.M.A.R.T. goal-setting skills.
EVALUATION EXERCISE:

Did I meet my individual goal this week?

Did we meet our group goal this week?

Looking back on this last week, were these goals both challenging and achievable?

S.M.A.R.T. AND F.I.T.T.
UNDERSTANDING BARRIERS TO PHYSICAL ACTIVITY

Barriers are *negative cues* that impact our physical activity. Cues can trigger us to action OR inaction – barriers are those cues that lead to inactivity.

We need to be aware of our barriers so that we can develop solutions to overcome them.

What are some barriers that you and your group members faced this week that either stopped you from doing your normal activity OR made you struggle with the decision to be active?

<table>
<thead>
<tr>
<th>BARRIER</th>
<th>SOLUTION</th>
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Now, let's first ask ourselves, can I adapt and overcome the barrier myself?

If so, then let's use some **problem-solving skills** to help us adapt:

1. Identify the **problem**
   
   e.g., “I have no time” - Is this the problem OR is time management the problem?)

2. Identify **solutions** within your means.
   
   e.g., I will choose a specific time and day that I will devote to my extra physical activity; I will enlist help from family and/or friends

3. Decide which solution is a good **first step** to try.

4. Try the solution and see how well it worked (**self-evaluation**).
   
   - Evaluation = “Pretty good result,” then keep it and adapt to the barrier
   - Evaluation = “Weak result,” then go to another solution and try again

If you cannot adapt on your own, then ask yourself, “Who can help me get over this barrier?”
If you are unsure of how to solicit support from others consider the following questions:

- **What type of assistance do you need in order to achieve your physical activity goals?**

- **What stops you from asking for assistance?**
  - “Do you help others when they ask you for help?” - other people will offer that kind of support and agree to help as long as you are specific with what it is you need assistance with
  - It’s ok to ask for help
  - Think of what would happen if you didn’t ask
  - Getting help when you need it is part of taking control of your physical activity goals

- **Who could you ask to help you with achieving your physical activity goals?**
  - Different types of assistance required for different activities, could different people help you with each activity?
  - If having difficulty thinking about who you could ask for assistance, think about those who you trust first so you feel comfortable asking for their help

The following page lists examples of individuals who may be able to assist you in adding one day of independent physical activity to your exercise routine.

Think of *how* these individuals can assist you in achieving your exercise goals. **BE SPECIFIC!** (There is space to add your own ideas)
<table>
<thead>
<tr>
<th>Social Support</th>
<th>How can they help?</th>
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</thead>
<tbody>
<tr>
<td>Family</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>I can wheel to a neighbourhood friend's house to visit for my extra session each week.</td>
</tr>
<tr>
<td>Exercise Buddy</td>
<td>If I miss an exercise session, I will call them to catch up on the presented material.</td>
</tr>
<tr>
<td>PSW</td>
<td>When assisting with my morning routine, I can ask them to tie my theraband to the door so I can use it for my home exercise.</td>
</tr>
</tbody>
</table>

Looking back at the barriers we have identified as a group, what are some solutions we can find for these barriers?
INDIVIDUAL GOAL

The type of activity I will do this week is: ________________________

I will complete _____ minutes of this activity.

Again, let's add up our individual goals to create a group goal. For the amount of time we will exercise independently this week!

PLANNING GOAL

When will I schedule my activity this week? ________________________

Check-in with your buddy this week and remind each other of your physical activity.
Appendix M: Study 2 session guide

Prior to the 4-week program: Individual videoconference orientation (20 minutes)

- Following the telephone recruitment: schedule a one-on-one videoconference tutorial and email the videoconference tutorial manual;

- During the videoconference tutorial:
  - The group facilitator shares her screen with the participant and guides him/her through the platform

Total duration: _______________

Start time: _______________

○ Practice the following actions:

○ Accepting a video call

○ Leaving a group call

○ Adding a friend

○ Testing the webcam and microphone

○ Screen sharing

○ Sharing files

End time: _______________
**Week 1: Group introductions, group orientation to Skype, Skype and program etiquette**

**Main session Objective: to develop group identity and program expectations**

**Introductions:**

Total duration: _______________

- All technical issues must be resolved/managed prior to beginning the session.
- Icebreaker activity: Facilitator & group members

Start time: _______________

  - Instructions: Introduce yourself and state what you enjoy doing during your leisure-time physical activity. Alphabetize order by first name

  - Create a poster (screen share): wheel with separate sections representing unique features and commonalities in the centre

End time: _______________

- ‘Netiquette’: Each person reads a line

Start time: _______________

  - Reduce/prevent external distractions (i.e., door/telephone and family/pets).
  - Golden rule: “Treat others the way you want to be treated.”
  - Prior to speaking, every person must state, “(Name) would like to ask a question/make a comment…”
  - If you experience audio or visual problems, you must inform the group via text messaging on the platform

  - Participant input on ‘Ground Rules’

End time: _______________

**Videoconference group tutorial**

Total duration: _______________
Discuss any questions or concerns regarding videoconference platform

Review steps to: (Facilitator shares screen during orientation). Assign tasks

- logging in and out of Skype and group conversations
- sharing files (PAGs and Toolkit documents)
- screen sharing
  - ask for skype version
- sending instant messages

Practice activity: identify steps to performing certain tasks on Skype via screen share (one participant at a time).

- adding a friend
- testing webcam and microphone
- sharing files (PAGs and Toolkit documents)
- sending text messages

Program introduction:

Total duration: 

Start time: 

Program vision, objectives, learning outcomes and session plans

Participant benefits

Confirm group goal (i.e., add one extra day of LTPA)

End time: 

Group identity:

Total duration: 

Start time: 

- Determine the Group Name: based on common group characteristics

- Discuss buddy system: identify buddy(ies) and share contact information (depending on receptivity expressed during recruitment)

End time: ______________

**Learning assessment:**

Total duration: ______________

Start time: ______________

- Go-round (alphabetical order): state previous person’s name and their answer prior to answering their own question
  - How can I benefit from participating in this program?
  - What is our group name?

End time: ______________

**Assign homework and debrief:**

Total duration: ______________

Start time: ______________

- Ask group members to start thinking about their own personal benefits (short and long term) from achieving the group goal.

- Reminder: Buddy system for next week

- Debrief: “How does everyone feel about the program expectations set out today?”; “How did this group session compare to other group activities you’ve been involved in?”; “That videoconference tutorial was a challenging task – why do you think things played out the way they did?”; “Based on this, what is one key lesson learned from the videoconference tutorial?”

- Survey reminder (have everyone check email during last 2 minutes)

End time: ______________
**Week 2: Self-monitoring**

Main session objective: guide participants into self-reflection on LTPA outcome expectancies and become more mindful of activity level throughout the day

**Icebreaker activity:** Myth or Reality?

Total duration: ______________

Start time: ______________

6. *A regular physical activity routine is best established when joining a gym or sports facility.*

7. *Physical activity requires special equipment.*

8. *I need to set a time to be physically active.*

9. *It’s dangerous to start increasing my physical activity as I get older.*

10. *No pain, no gain*

End time: ______________

**Homework discussion:**

Total duration: ______________

Start time: ______________

- Allow the group to discuss their homework privately for 5 minutes (facilitator mutes speakers)
  - Instruct group to elect someone to be the recorder/reporter role
  - Reconvene with facilitator: report on homework and buddy system; decisional balance discussion (PA benefits vs. risks)

End time: ______________

**Introduce session theme:** Self-monitoring

Total duration: ______________

Start time: ______________
Go rounds: each person chooses one physical activity that they do or can do that significantly increases their heart rate

Introduce the concept of self-monitoring physical activity behaviour

Determine potential barriers and facilitators to monitoring physical activity behaviour
   - Brainstorm self-monitoring reminder cues (i.e., cell phone alarm, agenda/calendar, buddy system)

Activity: guide participants through a self-monitoring time-sheet (screen sharing) and have each person contribute to a day of the week for predicting periods of activity and inactivity.

End time: 

**Homework:**

Total duration: 

Start time: 

- Ask group members to track their periods of physical activity and inactivity in their self-monitoring time-sheet (in the Participant Activity Manual).

- Request that each participant bring one practical exercise item that they can use on a regular basis to the next session (i.e., resistance bands and sport balls; or improvise with household items such as soup cans and water bottles)

- Reminder: Buddy system

- Debrief: “How does everyone feel about the program expectations set out today?”; “How did this group session compare to the previous group session?”; “Based on the introduction to self-monitoring, how do you think this tool will help you achieve your physical activity goals?”; “Thinking back to everyone’s contributions to the self-monitoring example, what is one important or useful piece of information that one of your fellow group members has taught you about planning physical activity?”

- Survey reminder (have everyone check email during last 2 minutes)

End time: 
Week 3: Goal-setting

Main session objective: to be able to identify and develop the features of a SMART goal

Icebreaker activity (5 minutes): Internet lingo

Total duration: __________

Start time: __________

- LOL, ftw, btw, brb, g2g, ttyl, nvm, idk

- Raise sign, and either have group members IM answer (first person to submit correct answer wins) OR do a go-rounds for easier communication

End time: __________

Homework discussion (15 minutes)

Total duration: __________

Start time: __________

- Allow the group to discuss their homework privately for 5-10 minutes (facilitator mutes speakers)
  - Instruct group to elect someone to be the recorder/reporter role
  - Analyze each other’s physical activity patterns and decide whether there are any commonalities.
  - Choose at least one 10-minute period each day that can be made into a bout of physical activity.

- Reconvene with facilitator: report on homework, buddy system and details about the private discussion; reflect on any barriers to implementing the 10-minute active periods; discuss on any challenges to remembering to track activity regularly.

- Acknowledge those who brought a practical exercise item to the session. Have each person describe how they use this item to stay active.

End time: __________

Introduction to goal-setting (25 minutes)

Total duration: __________
Start time: ______________

- Go rounds: each person chooses one physical activity that they do or can do that significantly increases intensity level (i.e., heart rate)

- Introduce the concept of SMART goal-setting and using the FITT principle (short-term and long-term goals)

- Activity #1: True or False – “What is missing from this goal?”; “Is this a specific task/goal?”; “Is this goal measurable?”; “Is this goal realistic and achievable?”

- Activity #2: Group goal development – each person helps create a goal by considering each of the indicators of a SMART goal by text messaging a response on the platform

- Go-rounds: have each person describe their individual SMART goal of adding an extra day of LTPA

- Group decision of target number of total minutes of physical activity to be accumulated by next session (if applicable, includes regular days of LTPA, as well)

End time: ______________

**Homework** (15 minutes)

Total duration: ______________

Start time: ______________

- Ask group members to continue tracking their periods of physical activity and inactivity in their self-monitoring time-sheet (refer to Program Manual). Explain that this will help them meet their individual (and group) goals.

- Reminders: Action cues to self-monitoring and staying accountable to individual goals (i.e., Buddy system, alarms, positive self-talk etc)

- Debrief: “How will SMART goal setting help you increase your physical activity”
  - “What is the most challenging aspect(s) of creating a SMART goal?”;
  - “Have your peers given you any useful ideas, explain?”;
  - “How did this group session compare to the previous group session?”;

- Survey reminder (have everyone check email during last 2 minutes)

End time: ______________
Week 4: PA barriers and problem-solving

Main Session Objective: learn how to evaluate one’s own goals and determine potential obstacles and solutions/alternatives

Icebreaker activity (5 minutes): Categories (2 second time limit per person)

Total duration:_______________

Start time:_______________

- Type of sport

- Professional sports team names

End time:_______________

Homework discussion (10 minutes)

Total duration:_______________

Start time:_______________

- Go-rounds: how many minutes of LTPA did each person accumulate throughout the previous week?

- Tally up the numbers to get the group result; compare to group goal set.

- Did everyone meet their individual goal?

End time:_______________

Overcoming PA barriers (30 minutes)

Total duration:_______________

Start time:_______________

- Based on the homework results, discuss any barriers or facilitators to meeting individual and group goal

  - Describe the concept of self-evaluation: How SMART/FITT was your goal? How often did you track your activity level? How did you keep track of your activity (i.e., mental note or written record?); How did you frame your goal statement (i.e., positive self-talk)?

- Problem-solving: predict future problems and solutions
What kind of obstacles may get in the way of your goal? What kind of concerns or other kinds of commitments do you have?

What can help you stay focused and committed to your physical activity goal (i.e., peer support, motivational/action cues and self-talk)?

Remind the group that lapses are normal. How will you get back into your physical activity routine?

- Go-rounds (screen share): each person has an opportunity to reassess their personal SMART goal and discuss possible modifications

End time:_____________

Conclusion (15 minutes)

Total duration:_____________

Start time:_____________

- Reassess group goal

- Reminders: Action cues to self-monitoring, staying accountable to individual goals, and overcoming any LTPA barriers (i.e., Buddy system, alarms, positive self-talk etc)

- Debrief: "How does everyone feel about the program expectations set out today?"; “Based on today’s lesson on problem-solving, how do you think this tool will help you achieve your physical activity goals?”; “What do you think will be the most challenging aspect(s) of maintaining an extra day of LTPA per week?”; “Have your peers given you any useful ideas, explain?”; “How did this group session compare to the previous group session?”; “List 3 important lessons learned from this program?” “How would you describe the main lesson learned from this program in one word?”

- Survey reminder (have everyone check email during last 2 minutes)
  - Remind about program follow-up survey (24hr post last session)

End time:_____________