

Assessing the research use and needs of organizations promoting healthy living for adults with disabilities

Shane N Sweet, PhD,^{1,2} Amy E Latimer-Cheung, PhD,¹ Chris Bourne, MA,³ Kathleen A Martin Ginis, PhD⁴

¹School of Kinesiology and Health Studies, Queen's University, 28 Division Street, Kingston, ON K7L 3N6, Canada

²Department of Kinesiology and Physical Education, McGill University, 475 Pine Avenue W, Montreal, QC H2W 1S4, Canada

³Active Living Alliance for Canadians with a Disability, 720 Belfast Road, Suite 104, Ottawa, Ontario K1G 0Z5, Canada

⁴McMaster University, 1280 Main St W, Hamilton, ON L8S 4K1, Canada

Correspondence to: S Sweet
shane.sweet@mcgill.ca

Cite this as: *TBM* 2014;4:86–94
doi: 10.1007/s13142-013-0231-2

Abstract

The uptake of research in community-based organizations (CBOs) is low and still unknown in CBOs that promote active and healthy living in adults with a disability. Using the knowledge to action framework, the objectives of this study were to determine if a gap exists regarding the use of research in CBOs, to learn about the preferred method to receive/read research evidence and to identify the barriers and facilitators of research use. Sixty-two employees of CBOs answered an online questionnaire. A research use gap was found as only 53 % of employees indicated they often or always use research. Conferences, emails and short research summaries were the favoured method of receiving/reading research information. Education, time and financial resources were important barriers to research use, while attitudes, intentions and self-efficacy were facilitators. More efforts are needed to develop tools to help CBOs use research.

Keywords

Knowledge translation, Theory of planned behaviour, Community-based organizations, Research use

Health promotion is imperative for adults with a disability as these individuals are at an increased risk of being obese and developing chronic diseases [1]. Currently, the average body mass index (BMI) of adults with a physical disability [mean=28.2 kg/m², 95 % confidence interval (CI)=27.8–28.6] is significantly higher than the average BMI of able-bodied samples (mean=26.0 kg/m², 95 % CI=25.8–26.2) [1]. In addition, adults with a disability have a higher prevalence of cardiovascular disease, diabetes and asthma, higher levels of blood pressure and cholesterol [1] and are more likely to be inactive than adults without a disability (25.6 vs 12.8 %) [2]. Despite evidence of successful interventions improving the health of these populations [3–5], health discrepancies between adults with and without a disability still exist. Turning to community-based organizations (CBOs) may be the next step for health promotion. CBOs have the potential to play a pivotal role in helping to address these health disparities.

CBOs are defined as not-for-profit organizations that have a structured organization (e.g. board of governors) and are guided by a strategic plan. These organizations habitually deliver programs and ser-

Implications

Practice: Community-based organizations promoting healthy living in adults with a disability should provide more training and opportunity for their employees to use research.

Policy: Funding should be provided to develop a knowledge product and associated training to facilitate the integration of research into programs.

Research: Research is needed to understand how individual and organizational factors interact to influence knowledge translation for adults with a disability.

vices to their community members who are often marginalized members of society (e.g. adults with a disability) [6]. As a result, CBOs are in direct, regular contact with adults with a disability [7] and are well positioned to implement and deliver evidence-based health promotion programs. However, virtually no structures or tools are in place to translate health promotion research into practice in CBOs [6, 7]. Using research evidence to inform program development is important because it can improve the effectiveness of the programs currently delivered by CBOs [6]. Determining if CBOs use research and the factors associated with its use will provide a foundation for developing strategies to increase the uptake and application of research within these CBOs.

The rate of research use is still unknown among CBOs that have a focus on promoting healthy living among adults with a disability. However, some rates have been identified in other health-related organizations. For example, when managers and professionals in health service organizations (e.g. ministries, regional authorities and hospitals) were surveyed, 57 % stated that they received research evidence, but only 39 % reported that research leads to changes in the programs or services delivered by their respective health organization [8]. In an example specific to CBOs, the capacity to acquire, assess, adapt and apply research related to AIDS/HIV was also found to be low [9]. Because the uptake of research evidence generally has been low in health-related organizations, we believe that similar rates will be

found in CBOs promoting healthy living in adults with a disability. To investigate these rates and factors associated with research use, a knowledge to action (KTA) framework [10] perspective was taken. A first phase of the action cycle of this framework is to identify if a problem or a gap exists. As such, the first objective of the present study was to determine the extent of research use in CBOs. Two other phases of the KTA framework were also investigated in this study: “understanding the context” (e.g. CBOs’ views of research) and “identifying barriers and facilitators to research uptake”.

Understanding the context is defined as comprehending “the process individuals or groups go through as they make decisions about the value, usefulness, and appropriateness of particular knowledge to their setting and circumstances” [10] (p. 20). Gaining insight into the types of research CBOs value can help understand CBOs’ research evidence preferences and, in turn, improve the strategies aimed at translating the research evidence to these CBOs. Dobbins and colleagues [11] showed that decision makers in health organizations preferred receiving research evidence from conferences/workshops, short summaries, colleagues and professional journals. Half of the sample also preferred to read executive summaries, while one third opted to read scientific abstracts. A recent study with HIV/AIDS CBOs revealed that these CBOs look for research mainly through websites, grey literature and peer networks [9]. Therefore, these studies highlight that scientific research is currently not the most preferred or utilized type of research in organizations. Accordingly, the second objective of this study was to identify the preferred methods of receiving and reading research evidence in CBOs that promote healthy living among adults with a disability, giving us insight into what these CBOs value.

Consistent with the KTA framework, a third objective was to discern the perceived barriers and facilitators of knowledge use in CBOs promoting healthy living in adults with a disability. Among employees of CBOs engaged in health promotion in the general population, time and availability of relevant research were determined as barriers [11], while time was also a key barrier to research use by nurses [12]. Lower levels of education have consistently been identified as an important barrier to research use across multiple studies [8, 13–15]. For instance, fitness trainers with lower levels of education were less likely to report using evidence from scientific sources (e.g. journal article) than fitness trainers with higher levels of education [15]. Therefore, barriers, including education levels, were investigated in the current study.

In addition to identifying barriers, it is imperative to recognize the facilitators of research use. We investigated the facilitators of research use within the context of the theory of planned behaviour (TPB) [16]—a theory that has gained support in knowledge translation contexts. We used this theoretical approach because positive beliefs and attitudes about research [13, 14], and greater confidence in applying research [17] have all been identified as facilitators of research use by health practitioners and are components of the TPB.

Theory of planned behaviour The main constructs of the TPB are attitudes, subjective norms, perceived behavioural control, intentions and behaviour. For this particular study, each construct was conceptualized as follows: attitudes were defined as individuals’ positive or negative beliefs about the use of research; subjective norms were defined as individuals’ beliefs regarding whether or not they should use research based on the social standard in their organization; perceived behavioural control was operationalized in terms of self-efficacy (i.e. perception of individuals’ ability to use research) because these variables are conceptually similar [18]; intentions were defined as the individual’s readiness to use research, while behaviour was assessed by self-reported use of research.

Accumulating evidence supports the utility of the TPB for identifying determinants of knowledge translation activities. For example, in a review of socio-cognitive theories used in knowledge translation, TPB constructs were associated with the use of research (e.g. clinical practice guideline implementation) by healthcare professionals [19]. A study assessing a knowledge translation strategy among addiction counsellors revealed that attitudes and subjective norms predicted intentions to use the evidence-based materials provided at a workshop. Intentions and perceived behavioural control were then related to the adoption of these materials 6 months later [20]. In a review of individual determinants of research utilization in nurses, attitudes towards research were the most consistent variable relating to research utilization [14]. No study, to our knowledge, has tested the TPB for research use with CBOs that promote healthy living in adults with a disability.

PRESENT STUDY

The overarching purpose of this study was to understand the research use and needs of CBOs promoting healthy living among adults with a disability. In line with the KTA framework [10], we aimed to describe the current research use of these CBOs to determine if a gap in research use exists (objective 1). Second, we investigated the research information preferences of CBOs to understand the local context (objective 2). Finally, we identified important barriers and facilitators of research use in CBOs promoting healthy living of adults with a disability (objective 3a). We specifically evaluated the facilitators through a TPB lens (objective 3b). Results from this study could provide insight into the most appropriate and necessary elements needed to create a knowledge tool (e.g. online database of research summaries) to help increase research use in these CBOs.

METHODS

Procedures and participants

We aimed to identify and recruit the most appropriate employees (i.e. individuals who were involved in program development) within each surveyed CBOs that promote healthy living in adults with a disability.

We used a variety of strategies to maximize recruitment. First, the survey was posted online to allow easy access for potential participants. Second, this project was conducted in collaboration with a national organization that brings together CBOs with a common mandate to improve healthy living among individuals with a disability. As part of this collaboration, the key contact person from this national organization (henceforth named “the representative”) sent the survey invitation to potential participants. Based on his experience and contacts in working in this area, the representative identified the most appropriate individuals and CBOs to be emailed. Third, we recruited during a 4-month period and sent out multiple reminders (approximately every 2 weeks). The inclusion of reminders was based on a recent study demonstrating the usefulness of reminders to increase participation rates [21]. Finally, we kept the survey as short as possible (~25 min) to avoid overburdening the participants.

The representative emailed a request to participate in our online survey to his contacts and organizational partners. A link was placed in the email, directing the participants to the survey. Participants ($N=62$; mean age= 43.75 ± 13.80 ; 71 % women) completed an online consent form followed by a 25-min survey. The flow of participants through the study is displayed in Fig. 1.

Measures

Demographics and organizational information—Participants indicated their age, gender and work-related experience and responded to questions pertaining to their CBOs (e.g. juristic focus, mandate).

Research use and information seeking—Items assessing research use and information seeking were derived from the work by Dobbins and colleagues [22]. Participants indicated (a) the extent to which they kept informed of the latest research evidence

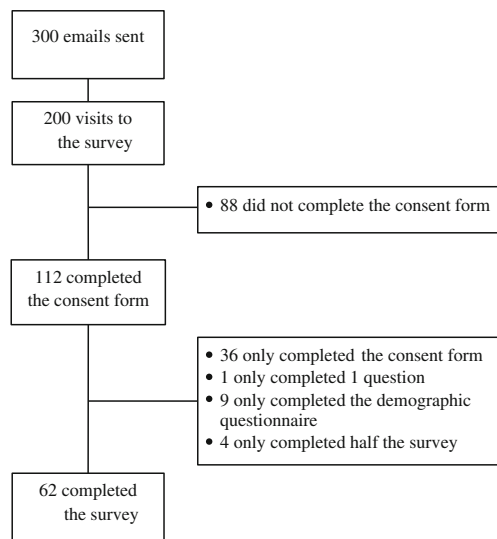


Fig 1 | Recruitment flowchart

(1=not at all to 7=extremely able to); the frequency to which they used research to guide the decision-making process the last time they developed a program (1=never to 5=always); the type of research information they find helpful (12 types: e.g. epidemiological data, program evaluation, individuals studies, systematic reviews/meta-analyses); the preferred method to receive research evidence (ten options: e.g. websites, emails, research journals, short summaries of research).

Barriers—This six-item measure assessed various barriers to research access and use such as availability of research, lack of time and training [11]. Participants rated each item on a five-point scale (1=not an issue to 5=a very serious issue). This scale was found to be reliable in past studies [11] and in this study (Cronbach’s alpha=.77)

Self-efficacy—Six items that increased in the extent that individuals had to integrate and use research in their work were assessed [13]. Participants indicated their confidence levels to engage in knowledge translation activities such as formulating a question to guide a literature search (item 1) and appropriately applying evidence from the literature to inform the planning and decision-making process (item 6). Items were rated on a scale from 0 (not at all confident) to 100 % (completely confident). This measure was found to be reliable (Cronbach’s alpha=.95).

Attitudes—Three items adapted from Salbach and colleagues [13] assessed attitudes towards the use of research for program development rather than the practice of physical therapy. Participants indicated the extent to which they agree (1=strongly disagree to 7=strongly agree) that application of research evidence is necessary, places an unreasonable demand on them and helps them develop better programs. These items had an acceptable Cronbach’s alpha of .74.

Subjective norm—Two items formed the subjective norm scale. Participants rated on a 1 (strongly disagree) to 7 (strongly agree) scale whether other employees of their organization were skeptical [13] or approved [16] of them using research. The items were correlated ($r=.78$).

Intentions—A single item measure of intention was used. Participants rated, on a five-point scale (1=definitely not to 5=definitely yes), if they intend to use research evidence as their organization revises and develops new programs [16].

Data analysis

Means, standard deviations and frequencies were calculated to describe the current research use (objective 1), preferred methods of reading and receiving research (objective 2) and associated barriers and facilitators (objective 3a). Because education had been identified as a key facilitator, a

chi-square analysis was conducted to determine if there was a difference between individuals with and without post-graduate education. A series of multiple regressions were conducted to test the TPB model. First, subjective norms, attitudes and self-efficacy were set to predict intentions. Second, each outcome was regressed onto intentions and self-efficacy in separate multiple regressions (objective 3b). Standardized beta and R^2 were reported.

RESULTS

Recruitment

The recruitment rate was lower than anticipated (21 %), despite several attempts to increase this rate (see Fig. 1). In an effort to uncover the reasons behind the low recruitment rate, the representative contacted employees of 17 CBOs and asked broad questions regarding their response rate and/or reasons for not responding. Although all 17 confirmed receipt of the email requests and reminders, only three individuals had completed the survey, two forwarded the survey to another member within the CBO and four said that they believed that their CBO was not in a position to complete the survey as they do not use research evidence. Based on the conversation with these CBOs, the representative mentioned that time was a factor for survey completion as many potential participants indicated that they had intentions to complete the survey, but it just was not a priority. Others mentioned that they had started the survey but were not able to complete it as other work-related tasks took precedence. Taken together, time appeared to be the biggest barrier to research participation.

Demographic information

Participants ($N=62$) had a mean age of 43.75 ± 13.80 years and were predominantly female (71 %). Twenty-two participants reported having post-graduate degrees (16 Master's degree, 1 medicine/dentistry and 5 doctoral degrees), 32 reported having a bachelor degree, 6 had a college/CEGEP degree or lower and 2 individuals did not report their education. The participants represented a variety of CBOs serving different sections and with an equal divide of juristic focus (see Table 1).

Identifying the gap—research use (objective 1)

As indicated by the means, individuals used research sometimes to often when developing their last program (Table 2). In addition, 53 % of individuals indicated that they often or always used research in their last program. Individuals rated low on their ability to keep informed of the latest research evidence as only 37 % indicated they were moderately to extremely able to keep informed. With regard to personal use of research, 53 % of individuals indicated that they would use research if they were made aware of it, but only 28 % indicated that they constantly search for new information to use (Table 3).

Table 1 | Characteristics of the Community-Based Organization

Variables	Mean (SD)	N (%)
Organizational information		
Position		
Senior Manager		17 (27 %)
Program Manager		8 (13 %)
Program Director		2 (3 %)
Coordinator		17 (27 %)
Administrator		2 (3 %)
Executive Director		3 (5 %)
Other		13 (21 %)
Years at position	6.52 (5.98)	
Sector^a		
Recreation		27 (44 %)
Sport		23 (37 %)
Medical/health care		18 (29 %)
Disability		38 (61 %)
Education		11 (18 %)
Other		25 (40 %)
Juristic focus^b		
National		22 (36 %)
Provincial/territorial		21 (34 %)
Regional		18 (30 %)
Mandate to promote physical activity to people with disabilities ^b		35 (57 %)

^a Individuals could select more than one section, so the percentage will not total 100 %

^b $n = 61$

Individuals with post-graduate education reported higher use of research when developing their last program than individuals without post-graduate education, $t(58)=3.20$, $p<.05$ (see Table 2 for means). In addition, postgraduates were more likely than non-postgraduates to report using research often or always (73 vs 40 %), $\chi^2=6.17$, $p<.05$. No other significant differences between individuals with and without a post-graduate education were found. We also compared organizational leaders (i.e. executive director, senior managers and program directors) to organizational staff and found no difference for both outcomes (research use, $t(47)=1.15$, $p>.05$; to keep informed, $t(47)=0.77$, $p>.04$). Because no differences were revealed between these two groups, this variable was not considered for any follow-up analyses.

Investigating the local context (objective 2)

Individuals claimed that demographic data (89 %) and program evaluation data (90 %) were the type of information they found most useful, while research evidence from individual studies (45 %), systematic reviews/meta-analyses (55 %) or professional journals (53 %) were not. Participants also indicated their preferred methods of receiving research were conferences and workshops (77 %), short summaries of research (74 %), websites (69 %), emails (67 %) and

Table 2 | Means (and standard deviations) of research use, theory of planned behaviour variables and barrier to research use

Variables	All	Post graduates	Bachelor degree or lower	<i>t</i> test	Cohen's <i>D</i>
Attitudes	5.75 (0.96)	6.10 (0.90)	5.51 (0.94)	2.40*	0.64
Subjective norm	5.38 (1.30)	5.52 (1.43)	5.27 (1.26)	0.53	0.19
Self-efficacy	72.15 (22.15)	80.68 (18.71)	64.97 (22.28)	2.61*	0.75
Intention	4.18 (0.86)	4.50 (0.74)	3.95 (0.87)	2.50*	0.67
Use of research evidence when developing last program	3.57 (1.06)	4.09 (0.81)	3.24 (1.06)	3.20*	0.87
Extent to keep up to date with research evidence	3.74 (1.50)	3.95 (1.33)	3.63 (1.63)	0.79	0.21
Barriers to research use					
Total	2.85 (0.75)	2.49 (0.70)	3.03 (0.73)	-2.87*	-0.75
Access to any research evidence	2.58 (1.16)	2.14 (0.99)	2.84 (1.17)	-2.37*	-0.63
Lack of time	3.35 (1.17)	2.95 (1.09)	3.55 (1.18)	-1.95	-0.52
Organization's financial resources	3.48 (1.02)	3.09 (1.02)	3.68 (0.97)	-2.23*	-0.60
Availability of relevant research evidence	3.09 (1.12)	2.78 (1.11)	3.23 (1.10)	-1.51	-0.41
Limited training or experience in evaluating the quality of research evidence	2.51 (1.21)	2.00 (1.07)	2.79 (1.23)	-2.50*	-0.67
If your organization was to have more access to research, would there be resistance to change	2.08 (0.93)	1.96 (1.05)	2.13 (0.87)	-0.66	-0.18

Degrees of freedom for all *t* tests were 58

**p* < .05

newsletters (58 %), while listservs (18 %), media releases (32 %), colleagues (47 %) and research journals (50 %) were least favoured. As seen in Table 3, individuals with post-graduate education found epidemiological data, $\chi^2=4.43$, $p<.05$, evidence from individual studies, $\chi^2=4.88$, $p<.05$, systematic reviews/meta-analyses $\chi^2=10.07$, $p<.05$ and professional journals, $\chi^2=6.17$, $p<.05$ to be more useful for their decision making than individuals without post-graduate education. The only difference for education level found for the preferred methods of receiving research information was for listservs, $\chi^2=5.92$, $p<.05$, where this mechanism of communication was favoured by individuals with post-graduate education (Table 3).

Barriers and facilitators of the update of research evidence (objective 3)

Research use barriers—Time and the CBO's financial resources were two of the highest rated barriers. Perceptions of barriers varied by education level as individuals who did not have a post-graduate degree reported that access to research, the organization's financial resources and limited training or experience were greater barriers regarding their use of research than individuals with post-graduate education ($p<.05$; Table 3).

Facilitator: TPB—As revealed by the means, participants reported favourable attitudes towards research use as well as moderate to high levels of confidence and intentions to use research. These perceptions also varied by education level because individuals with a post-graduate degree reported significantly higher levels of attitudes, self-efficacy and intentions to use research compared to individuals without a post-graduate degree ($p<.05$, Table 2).

The TPB model was tested across two different research behaviours: research use when the participants developed their last program and the participants' ability to keep informed of the latest literature. Attitudes were the sole predictor of intentions ($F(3, 58)=37.57$, $p<.05$, $R^2=.66$), intentions and self-efficacy were significantly and positively related to research use (panel A, $F(2, 69)=35.19$, $p<.05$, $R^2=.54$) and only self-efficacy was significantly associated with the extent to keep informed of the latest research (panel B, $F(2, 59)=5.08$, $R^2=.15$). The standardized betas are provided in Fig. 2.

DISCUSSION

The overall purpose of this study was to understand the research use and needs of CBOs promoting

Table 3 | Preferred research evidence to receive/read

	Total %	Post-graduates (N=22) %	Bachelor degree or lower (N=38) %
Which type of information is useful to the decision-making process?			
Epidemiological data	71	86	61
Surveillance data	71	82	66
Statistical data	89	91	90
Program evaluation data	90	91	92
Current practices in your organization	65	64	63
Organizational values and beliefs	65	64	66
What others are doing	76	86	71
Research evidence from individual studies	45	64	34
Systematic reviews/meta-analyses	55	82	40
Professional journals	53	73	40
Media	39	46	34
Regional/National/Provincial standards/policies	73	73	73
Which of following ways do you prefer to receive research evidence?			
Websites	69	68	74
Email	67	68	71
Newsletter	58	50	66
Listserv	18	34	8
Media releases	32	23	40
Health related research journals	50	59	45
Professional journals from your field	53	55	50
Colleagues	47	46	47
Conferences/workshops	77	77	76
Short summaries of research	74	77	76
Other	3	9	3
Constantly searching for new ideas to use	28	32	24
Make use of new ideas I am made aware of	53	55	54
Prefer to see how it gets used somewhere else	15	14	16
Skeptical of new ideas, but can be convinced	3	0	5

Only 60 of 62 participants provided their education levels

healthy living in adults with a disability by taking a KTA framework [10] perspective. Results of this study revealed approximately half of participants consistently used research, highlighting a gap in the use of research use among CBOs. This study also provided an understanding of the local context by identifying preferences for receiving research evidence through conferences/workshops, a website, emails and to read summaries of the findings rather than individual studies or reviews/meta-analyses. Time, financial resources available to CBOs and lower levels of education appeared to be barriers to research utilization. The TPB analyses revealed that attitudes, intentions and self-efficacy were facilitators of research use, while only self-efficacy was related to the participants' ability to keep informed of the latest research. These results provide insight into strategies to help the uptake of research in CBOs.

Identifying the gap (objective 1)

Only approximately half of the employees in these CBOs reported using research often or always, and less than a third of these participants reported searching the

literature for new ideas. These rates of research use were not surprising as other studies investigating the use of research in other health organizations and CBOs found similar results [8, 9]. Therefore, more knowledge translation activities (i.e. presentations, workshops) need to be conducted to inform CBOs of the availability of research (e.g. systematic reviews, intervention studies) and how to use it in their organizations. There was an even larger discrepancy in research use when comparing individuals with and without a post-graduate degree. Finding that individuals with a higher level of education reported greater use of research is consistent with existing literature [15]. Interventions aimed at increasing research use in organizations may need to develop different approaches (e.g. more comprehensive training programs) for individuals with and without a post-graduate degree. These training programs should aim to include organizational leaders and staff as both types of positions reported similar rates of research use.

Adapting to the local context (objective 2)

Regarding preferences for receiving and reading research, individuals in this study indicated similar

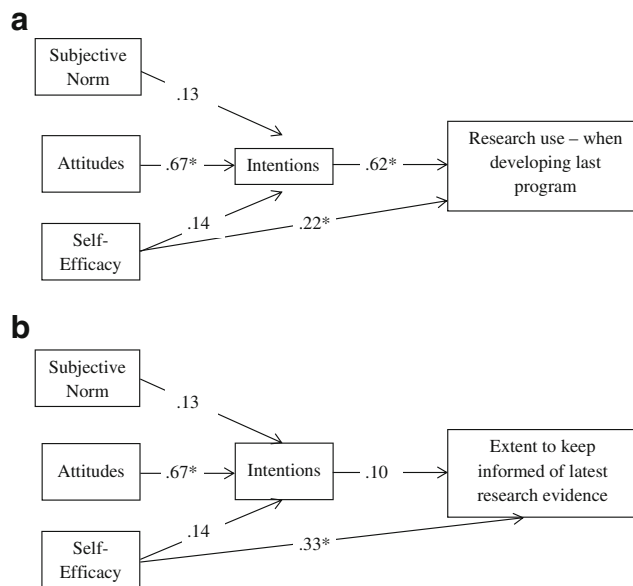


Fig 2 | Test of theory of planned behaviour model (TPB). **a** TPB model for research use when developing programs. **b** TPB model for extent to keep informed of latest research evidence. Standardized beta coefficients are presented. * $p < .05$

preferences as those outlined in studies by Dobbins and colleagues [11] and Wilson et al. [9]. Specifically, individuals preferred receiving research evidence from conferences/workshops, emails and websites. Short summaries of research were also a preferred method of receiving and reading research evidence, comparable to individuals interviewed by Dobbins et al. Based on these findings, it appears that a knowledge product that summarizes research evidence using an online format would be useful for these individuals.

This recommendation for an online database is consistent with a qualitative study that demonstrated that health care promotion personnel (e.g. public health managers) supported the creation of an online database summarizing public health interventions/reviews and wanted updates on this database [23]. As a result, Dobbins and colleagues launched an online database (healthevidence.ca) and found the uptake to be very high with an average of 100 users a day in the past 5 years [24]. Therefore, such sites have proven to be effective. A similar tool is now being developed and evaluated for HIV/AIDS CBOs to facilitate the integration of research into their practice [25]. This knowledge translation strategy incorporates a variety of tools such as a searchable database for systematic reviews relevant to HIV/AIDS, email updates of newly added reviews and access to user-friendly summaries. As in the HIV/AIDS community, there is a need for a similar product to be developed and tailored for health promotion for people with a disability. Indeed, the majority of individuals in our study indicated they would at least consult the online database sometimes (95%). This recommendation is derived from the local context and thus in alignment with the KTA framework.

Barriers and facilitators to the uptake of research evidence (objective 3)

As per the KTA framework, identifying key barriers is an important element. Time was revealed as one of the biggest barriers in addition to resource allocation and limited training available to evaluate the quality of research. When comparing individuals with and without a post-graduate education, higher levels of education appeared to buffer against these barriers as highlighted by the moderate to high effect sizes found in four of six barriers. Individuals with post-graduate education most likely have been exposed to research or even conducted their own research. It is not surprising that they report fewer barriers to research use given their likely exposure to research. In addition, individuals with post-graduate education (i.e. higher levels of education) reported using more research in their last program, finding research evidence from individual studies, systematic reviews/meta-analyses and professional journals more useful and having more favourable attitudes, greater self-efficacy and intentions. The aforementioned online database could alleviate some of these barriers. For example, reading summaries of research is less time-consuming than reading full articles/reviews/meta-analyses. If workshops/webinars are created to accompany the online database, they could further inform individuals about how to access and use the online database and on how to read, interpret and implement the research findings. These workshops could be especially relevant to individuals without post-graduate education in order to expose them to research and possibly buffer the impact of barriers to research use. These workshops/webinars would then facilitate the use of the online database, and subsequent research evidence. Researchers also need to make

their research findings more easily understood by CBOs. One strategy that has started to gain ground in selected peer-reviewed scientific journals is to have a specific section that summarizes the results in non-scientific terms. Broadening this strategy can be a first step to make research more interpretable to the general population.

Theory of planned behaviour—The tenets of the TPB were partially supported within the context of research use as attitudes were related to intentions and both intentions and self-efficacy were significantly and positively associated with the research use outcome. These findings are consistent with the results from a previous review [19], supporting attitudes, intentions and self-efficacy as facilitators to research use. However, contrary to the TPB's tenets, only self-efficacy was linked with the outcome "extent to keep informed of the latest literature". A measurement issue could explain why intentions did not predict this outcome. As highlighted by Ajzen [26], items of TPB questionnaires should be formulated to be compatible with the outcome. For this study, the items of the TPB were written within the context of overall research use. It may not be surprising that the results supported the research use outcome and not the more specific "ability to keep informed of latest research" outcome.

Regarding the prediction of intentions, the significant and positive link between attitudes and intentions is in line with theory and past research [19, 20]. However, subjective norm and self-efficacy were not significantly associated with intentions which contradict the TPB as well as some empirical findings. In their review, Godin and colleagues [19] revealed that 69 to 79 % of the reviewed studies found a significant relationship of intentions with attitudes, subjective norms and perceived behavioural control (i.e. a construct similar to self-efficacy). The contrary results between this study and the review may be due to the population studied (healthcare professionals versus CBOs). Breslin and colleagues [20] found that attitude was the strongest predictor of intentions to use research in a group of addiction counsellors ($\beta=.61$). It is possible that for individuals in CBOs promoting healthy living for adults with disabilities, their intention to use research may be more attributable to personal attitudes than the influence of others and their own confidence. However, more longitudinal, experimental and intervention research with these CBOs is needed before causality can be assumed.

Because our study demonstrated a strong relationship between attitudes and intentions, future knowledge translation intervention could focus on changing attitudes towards research use. One strategy would be to demonstrate how incorporating research can improve the effectiveness of health promotion programs. By providing examples of other programs successfully integrating research, one's sense of belief about the usefulness of research may change. In addition,

fostering greater self-efficacy could help to lead to greater research use. Strategies that have been shown to increase self-efficacy in other behaviour domain and that could be applied to the knowledge translation area are: reinforcing effort or progress and providing instructions [27]. A workshop/training program where individuals learn how to read, interpret and apply research in their work could increase self-efficacy for research use. Follow-up sessions could be organized with each participant to further provide instructions and reinforce the progress one has done to incorporate research into their programs. Such a workshop is not only important to increase their research self-efficacy but can also target a key barrier identified in this study: limited training to evaluate the quality of research. Overall, these findings do give some insight on meaningful content for a knowledge translation intervention. Additional analysis of ancillary survey data does support training as a viable option to promote research use as 71 % of the sample reported that receiving additional training would be valuable.

Strengths, limitations and future research

This study is the first to investigate the research use and needs of CBOs that promote healthy living of adults with a disability. Another strong point of this research is the evaluation of the TPB model because no studies have evaluated a full TPB model for knowledge translation in these CBOs. Despite these strengths, the low sample size limited the use of more advanced statistical analyses. We did not collect descriptive data (e.g. position in organization) on all individuals that were contacted to partake in the study and therefore could not determine the extent to which individuals in different positions were likely to respond to the survey. Collecting this information would provide insight into characteristics of CBOs and their employees and could help determine who are more versus less willing to participate in knowledge translation research (e.g. are program directors less likely to participate than coordinators?). Interpretation of the results also warrants some caution, especially regarding the rates of research use, as the numbers may be inflated due to the low participation rates and to a substantial proportion of our sample having post-graduate degrees. Future studies with broader, more representative sample are needed to confirm and extend the current findings. Strategies that could aid in recruiting a larger more representative sample include: shortening the survey (e.g. 15 min) to only key questions to overcome the time barrier and offering incentives to entice participation such as a lottery (one in ten chance of winning X amount of money/gift card) or a small gift card (e.g. \$5) [28]. Another limitation of this study is the sole focus on individual level predictors of research use. Future research should consider both individual and organizational factors that may influence research use in CBOs in an effort to disentangling each factor's unique role in facilitating knowledge translation activities within a CBO.

CONCLUSION

This study provides initial insight into the first phases of the KTA framework, and has identified a need to increase the use of research in CBOs and to address the relevant barriers to research use. In addition, the TPB-framed evaluation gave us further insight into the relationship between attitudes, intentions, self-efficacy and research use. Taken together, we recommend that a knowledge product and associated training be developed to increase research use in CBOs promoting healthy living in adults with a disability.

Acknowledgments: We would like to thank all participants for taking the time to answer the survey. This project was funded by the Canadian Institute of Health Research (CIHR) and a Community-University Research Alliance (CURA) grant from the Social Sciences and Humanities Research Council of Canada (SSHRC).

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