INFORMATION TRANSFER: WHAT DO DECISION-MAKERS WANT AND NEED FROM RESEARCHERS?

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Abstract

Purpose:

The purpose of this study was to undertake a systematic assessment of the needs of decision-makers, working in community-based organizations, for research-based information, in order to understand both the content required and the format/methods by which that information should be presented, as part of a more comprehensive knowledge transfer and exchange strategy**.**

Methods:

A cross-sectional telephone administered survey. Questions covered current practices, research use, demographic information as well as preferences for receiving research information. Three types of organizations participated: Children's Treatment Centres of Ontario (CTCs); Ontario Community Care Access Centres (CCACs); and District Health Councils (DHCs). The analysis used descriptive statistics and analyses of variance (ANOVA) to describe and explore variations across organizations.

Results:

The participation rate was 70%. The highest perception of barriers to the use of research information was reported by the CCAC respondents, followed by CTCs and DHCs. The CTCs and DHCs reported greater use of research evidence in planning decisions as compared to the CCACs. Four sources of information transfer were consistently identified. These were websites, health-related research journals, electronic mail, and conferences and workshops. Preferred formats for receiving information were Executive Summaries, Abstracts, and original articles.

Conclusions:

There were a number of similarities across organization type with respect to perceived barriers to research transfer as well as the types of activities the organizations engaged

in to promote research use in decision making. These findings support the importance of developing interactive, collaborative knowledge transfer strategies, as well as the need to foster relationships with health care decision-makers, practitioners and policy-makers.

Background

Knowledge Translation and Exchange

In recent years the terms knowledge transfer and exchange, evidence-based decision-making and evidence-informed health policy have become commonly used, with little consensus on their definition, how they occur or can be promoted [1,2]. Furthermore, significant resources and time are invested in the production of research evidence that, if effectively transferred, could be used to inform policy and practice decisions and subsequently improve patient and population health outcomes[3]. A key recommendation arising from the National Forum on Health[1] [4] was the development of an evidence-informed health care system in Canada where policies and clinical decisions are influenced by high quality research knowledge. As a result, considerable research inquiry has focused on understanding the processes of evidence-informed decision making, as well as on how to facilitate it.

In order to move toward an evidence-informed health care system significant environmental changes are required. At a minimum, researchers must become more effective communicators of their research findings; gain a better appreciation of the context in which decision-makers function; and build more collaborative relationships with policy makers, decision makers and practitioners [3,5,6]. In addition, policy makers, decision makers and practitioners must become more receptive to the inclusion of the best available research evidence in the decision making process, and

[1]In October 1994, the Prime Minister of Canada launched the National Forum on Health to involve and inform Canadians and to advise the federal government on innovative ways to improve the health system and the health of Canada's people. The Forum was set up as an advisory body with the Prime Minister as Chair, the federal Minister of Health as Vice-Chair, and 24 volunteer members who contributed a wide range of knowledge founded on involvement in the health system as professionals, consumers and volunteers.

be willing to collaborate with researchers to ensure that relevant and applicable research is conducted [7-9].

The knowledge transfer field in health care, while relatively young compared to other empirical fields, has evolved significantly in the past 40 years: from the identification of barriers and facilitators, to determining the effectiveness of dissemination strategies, to the exploration of decision-making processes and organizational capacity for change, to the evaluation of collaborative efforts to bring producers and users of research evidence together to develop, implement and interpret research evidence. Consistent barriers across all settings include lack of available time, lack of access to current research literature, limited critical appraisal skills, excessive literature to review, work environments that do not support research transfer and uptake, lack of decision-making authority to implement research results, organizational decision-making processes that are not conducive to research transfer and uptake, resistance to change, and limited resources for implementation [10-17].

While the process is complex and ever changing some generalizations about knowledge transfer and exchange (KTE) can be made. Traditional passive strategies used alone are relatively ineffective [18,19]. Strategies that are more interactive and involve face-to-face contact show promising results with a variety of target populations [12,20-23]. Involvement of decision-makers in the research process has been shown to be associated with higher degrees of uptake [24]. When the results or 'messages' of research results are tailored to the specific needs of decision-makers then perceived uptake is higher [3,25,26]. An emerging hypothesis is that a combination of strategies, resulting in an interactive, multi-component KTE program that reinforces relationships between research producers and users, and reaches

potential users on multiple levels, may be most effective in achieving an evidence-informed health care system [27].

The *CanChild* Centre for Childhood Disability Research at McMaster University, funded since 1989 by the Ontario Ministry of Health and Long-Term Care, implements interactive, multi-component interventions that reinforce relationships between research producers and potential users. Two main goals of *CanChild* are to: provide effective leadership and innovation in childhood disability research and information transfer; and impact on knowledge, practice, services, and policy in childhood disability through programmatic research and research transfer [28]. *CanChild* accomplishes these goals by working collaboratively with community agencies including the 21 members of the Ontario Children's Treatment Centres (CTCs) and the Ontario Community Care Access Centres (CCACs), and to a modest extent the District Health Councils of Ontario.

Since its inception *CanChild* has worked in partnership with all of the CTCs in Ontario. The CTCs provide developmental therapies and family-based services to children with a variety of developmental disabilities and their families [29]. More recently, *CanChild* has started working collaboratively with the CCACs of Ontario, which have become increasingly involved in the provision of services to children with disabilities. CCACs offer a point of access to Ontario's long-term care system by: assessing and arranging for visiting health and professional services in people's homes; assessing, authorizing and arranging for the provision of school health support services for children; providing information and referrals to the public about other community agencies and services available to them; and coordinating services such as nursing, physiotherapy, occupational therapy, speech-language therapy, dietician services, social work, personal support and homemaking [30]. The District Health

Councils provide advice to the Ontario Ministry of Health and Long-Term Care on health needs and other health matters in their geographic areas. They also play an important role in the provision of health care information in their communities, as well as promote the integration of health services and identify health planning needs [31].

For the purpose of exploring different decision makers' perspectives on knowledge translation all three types of organizations were approached to participate in this study. These organizations were chosen because they are all involved in developing services for children with disabilities, but have different relationships with *CanChild.* For example, at the time of this study there existed a longstanding partnership between the CTCs and *CanChild*, including a focused program of KTE between the two. While *CanChild* had a working relationship with the CCACs, the relationship was in its infancy, and at the time of this study there had been fewer opportunities to promote the transfer and uptake of research information by CCACs. In addition at the time of this study there was no formal, established relationship between the DHCs and *CanChild*. It was expected that variations in the respective missions and existing relationships with *CanChild* would provide interesting observations related to the uptake of research evidence in decision-making.

Among the most consistent issue identified by those working in the childhood disability field is the need for information that is of high quality, synthesized, easy to use and easy to access [32]. In its attempt to address these information needs *CanChild* reviewed the KTE literature to assist in the development of a KTE program that would facilitate relationships between research producers and users, and promote evidence-informed decision making and practice [3,5,33-36]. Their review of the literature and interaction with the CTCs led to the adoption of these guiding

principles. The dissemination **source** must be perceived as competent, credible and trustworthy. The **content** must be perceived as relevant, usable, methodologically sound, and comprehensive to users. The **medium** must be accessible, user-friendly and clearly understandable. Finally, the **intended user** must perceive the relevance of the materials to their own needs, and understand it in the context of their work.

These principles guided the development of the Research Dissemination Program which aims to enhance the incorporation of *CanChild's* and others' research evidence into policy and program decision-making [37]. A major objective is to facilitate the transfer and uptake of this research evidence specifically by CTCs and CCACs. The program is centered on the "Keeping Current" materials. These are brief 'bottom-line' systematic reviews of issues that have been assessed as being important 'hot topics' in the childhood disability field. They are written in plain language, are 3-5 pages in length, and can be read easily and quickly. Through Impact Surveys carried out by *CanChild* it has been shown that the "Keeping Current" format is one that decision-makers and clinicians appreciate and has influenced thinking about issues and use of information [32]. While some evaluation has been conducted on this program, *CanChild* investigators have never systematically studied what information, in what formats, people want and need in their roles as clinicians, managers, directors and CEOs**.** It is timely to evaluate the impact of such a program so that knowledge gained from this strategy can be used to enhance *CanChild's* program as well as inform KT strategies for other research-producing organizations.

It is understood that research uptake varies significantly across decision making levels (i.e. CEOs, directors, managers, clinicians) Therefore, in this study it was recognized that responses would vary not only across the three organizational types but also among the different decision-maker levels. For example CEOs and

senior managers/directors could utilize research evidence in decisions related to broad organizational policies concerning service provision or in recommendations for provincial health policies. Middle managers could use research evidence to inform decisions related to program planning. Clinicians could use research evidence to inform clinical practice, and senior health planners could use research evidence to inform recommendations for local and provincial resource allocation and service provision. Regardless of the decision type, it was expected that research evidence would be used by all participants in some way to make decisions during the study.

The purpose of this study was to undertake a systematic assessment of the informational needs and preferences of decision-makers working in the area of childhood disability in order to understand both the content required and the format/methods by which that information should be presented, that would contribute to a more comprehensive knowledge transfer and exchange strategy.

Methods

Design

The design was a cross-sectional telephone-administered survey comprised of 65 questions (available from the first author upon request) and took, on average 20-25 minutes to complete.

Respondents

Decision-makers at any level within the organization, ranging from CEOs to front-line clinicians (i.e., speech therapists, physiotherapists, occupational therapists) were invited to participate in the study. Senior health planners who worked only at DHCs were also recruited.

Content of the Survey

The survey asked questions about current practices, research use, demographic information, as well as preferences for receiving research information. The survey was divided into five sections. (i) Questions that sought to understand the current practices and culture of the organization were asked first in order to provide the investigators with a more complete picture of the attitudes and motives of the respondents; (ii) questions about access to research evidence and use by the individual and perceived barriers to the access and use of research evidence; (iii) questions about which formats and styles of research information were preferred and the perceived use of research by the organization and field of health providers as a whole; (iv) questions about possible mitigating factors in transferring information from researchers to service providers (e.g. established relationship between research producers and users), and whether the current circumstances of that transfer were satisfactory; and (v) questions about current practices, culture, barriers and mitigating factors and the demographic structure of the organization and region.

Scoring and Data Analysis

A variety of Likert scales, all consisting of 5 points, were used in this survey. Possible responses for questions 11-16 included 'Not an issue', 'a minor issue', 'a moderate issue', 'a serious issue', and 'a very serious issue'. For questions 36-41 the following response options were available: 'definitely won't', 'probably wont', 'may', 'probably will', and 'definitely will'. For questions 42-44 response options included: 'excellent', 'good', 'moderate', 'fair', 'poor'. Finally for questions 46-56 responses included: 'strongly agree', 'moderately agree', 'neither agree or disagree', 'moderately disagree', 'strongly disagree'. Prior to analysis all of the scores were

transformed so as to be consistent in direction, which meant scores ranged from 1-5 with higher scores representing more positive perceptions.

Rather than relying exclusively on scores of individual items, groups of related items were scored and prorated according to the number of items in the group. Thus, for example, an 'Integrated Barrier Score' was derived from items 11-16 of the questionnaire, grouped into scale scores based on a three-point rating which combined ratings that appeared similar. For example 'not an issue' and 'minor issue' were scored as 'generally not an issue', 'moderate issue' stayed as is, and 'a serious issue' and 'a very serious issue' were scored as 'generally a very serious issue'. After adjusting the data to reflect this reclassification, the average scores for each of items 11-16 were summed and divided by the total number of items (n = 6) to derive an 'Integrated Barrier Score'. The same procedure was used to derive a 'Research Culture Receptivity Score' for items 45-50 of the questionnaire.

The analysis used descriptive statistics to report the patterns observed with the survey materials. Since item non-response varied, there are differences in the total number of participants for which data is available for different items. To explore variations across the three types of organizations involved in this study, analyses of variance (ANOVAs) were used, applying Tukey's HSD for post-hoc analyses where the ANOVA was significant at $p < 0.05$. Given the exploratory nature of this study $p < .05$ was used so as to be more inclusive of potentially important variables.

Ethics

Ethics approval was sought and obtained from the McMaster University Research Ethics Board.

Administration of the Survey

Respondents received an initial phone call to schedule a time to conduct the survey. The interviews were performed and data collected between January and April, 2002. While it is understood that research use tends to be over-estimated by health care professionals when self-report measures are used rather than a combination of direct observation and self-report [38], a self-reported telephone administered survey, adapted from previously published research [18,39] was used for this study. Two methods were used to reduce respondent over-estimation of research use: respondents were assured their responses would be kept confidential and anonymous; and they were asked to give specific examples of research use. Previous research has demonstrated less overestimation of research use among public health professionals when concrete examples of research use are sought [39]. Furthermore, given that this was the first study of its kind to be conducted with this sample, it was expected that direct observation of individuals or teams would severely reduce participation in the study.

Results

Overall the participation rate was moderate with 92 of 131 potential respondents (70%) completing the survey. Table 1 provides a summary of participant characteristics from each organization as well as type of decision maker. The respondents varied in age, with the majority in the 40-59 year age group. The educational background of the respondents included a bachelor's degree n=30 (32.6%); a master's degree n=53 (57.6%); doctorate n=1 (1.1%); and MBA n=8 (8.7%). Respondents had been in their current roles for a mean of 5.5 (±4.3) years, and in the field of childhood disability for a mean of 9.1 (±9.3) years.

Evidence of the Validity of the Questionnaire

Responses to four survey questions provide evidence of construct (discriminant) validity of the approach used in this survey. In response to the question: "With respect to its ease of use, how would you rate the quality of research information you have received recently?" there was a significant difference across the three organizations in favour of the CTCs. The overall mean score was 3.82 with mean scale scores of 4.11 for CTCs, 3.88 for DHCs and 3.57 for the CCACs ($p<0.01$). This finding was taken to reflect the active and collaborative relationship between *CanChild* and the CTCs that resulted in relevant and timely research being disseminated to them. In response to the statement: "My organization routinely actively looks for research information before making decisions", the overall mean score was 3.83, with mean DHC responses averaging 4.54, the CTCs 3.81 and the CCACs 3.35 ($p<0.01$). This finding is thought to reflect the research nature of the DHCs and the 'clinical' focus of the other programs, in which research information informs, but is not essential to, all decisions taken at the program planning and clinician level. Similarly, in response to the statement: "My organization provides ongoing training in research methods and critical appraisal to staff", the overall mean value was 2.75, with the DHC respondents reporting a mean of 3.50, the CTCs a mean of 2.63 and the CCACs a mean of 2.31 ($p<0.01$). Finally, in response to the statement: "Overall, my organization provides adequate resources (financial or personnel) to implement decisions that are based on scientific evidence" the overall mean value was 3.62, and there was once again a gradient in favour of the DHC respondents (mean 4.04) compared with the CTCs (mean 3.52) and the CCACs (mean 3.43) ($p=0.04$).

Barriers to Research Transfer

Table 2 reports the relative importance of the barriers to research transfer, according to organization type and position. The only item where a statistically significant difference between organization type was observed for the question: 'to what degree is resistance to change at your organization a barrier to accessing and using research information in decision-making?' (P =.003). For this item the CCACs reported a significantly greater barrier with respect to resistance than either the CTCs or DHCs. When responses were analyzed by position and organization type, no statistically significant differences were observed for any of the barrier items.

Data on the barrier items 11-16 were then aggregated and analyzed to determine if there were differences overall of perceptions of barriers between the three organization types. The mean overall barrier score on a three-point scale was 1.72 (higher scores report perception of greater barriers). Baseline characteristics such as age, type of organization being surveyed and respondent's highest level of education were not significantly associated with perceptions about barriers. There were statistically significant variations across organization type with the CCACs reporting the highest perception of barriers to the use of research information with a score of 1.88, while the CTCs reported a score of 1.65 and the DHCs a score of 1.59 ($p<0.006$).

Organizational Characteristics

The data were also analyzed to explore associations between organizational characteristics and research use by organization type and position. The results are presented in Table 3. For all but one of the characteristics (mechanisms exist that facilitate the transfer of information), there were statistically significant differences across the three organization types. DHCs scored significantly higher on all items

with the exception of impact of regulation and legislation where they scored lowest. When the data were analyzed by position there were statistically significant differences observed for two items: 'the organization provided ongoing training in research methods' (P=.03); and 'the organization makes decisions in collaboration with other health organizations' (P=.005). A third characteristic, 'the organization routinely looks for research information before making decisions', approached statistical significance (P=.053). For these characteristics senior health planners' perceptions varied significantly from participants in other positions. For example, senior health planners perceived the organization provided significantly more training (3.63) than did directors (3.06), and managers (2.07). Senior health planners also perceived the organization to collaborate significantly more with other health organizations for decision making (4.9), compared to directors (4.44) and clinicians (3.46).

Data on these organizational characteristics were then aggregated and analyzed to determine if there were differences of overall perceptions of organizational characteristics across the three organization types. These data are presented in Table 4. The mean overall organizational culture score on a five-point scale was 3.8 (higher scores are associated with a 'better' research culture). There was a statistically significant difference across organization type with DHCs, not surprisingly given their predominant focus on research activities, scoring the highest and the two service program organizations, CCACs and CTCs, reporting similar lower scores, CCACs and CTCs ($p<0.01$).

Decision Makers' Perceptions of Knowledge Translation Strategies

People were asked two sets of questions about their preferred ways of receiving research information. The first set asked about each of several ways

individually; the second asked people to rank their preferences. Table 5 reports the results of analyzing respondents' feelings about several possible methods for receiving information by organization and position. Those for which more than 90% of participants responded yes included: conferences/workshops; short summaries; colleagues and professional journals while listservs were least preferred. There were no statistically significant differences in preferred methods for receiving research information according to position and only one statically significant difference observed at the organizational level. DHCs (46% saying yes) preferred listservs considerably more than CTCs (16.7%) and CCACs (5.4%). When the ranked methods of receipt of research information were assessed and weighted for organization type and position, four knowledge transfer methods stood out as being preferred most by the participants. These were: websites, health-related research journals, electronic mail, and conferences and workshops.

Questions about the preferred formats for receiving information showed that people's first choices were for Executive Summaries (53.2%), Abstracts (29.3%) and original articles (17.4%). Second choices were for Abstracts (45.7%), original articles (28.2%) and Executive Summaries (26.1%).

Assessment of Perceived Impact of Research Information on Decision-Making

Four criteria were assessed to explore the use of research information in program decision-making. The results are presented in Table 6. There was a statistically significant difference between organization type for only one outcome: 'Research information provided justification for service/program decisions made by my organization', with DHCs rating this item significantly higher than CTCs and the CCACs ($P<.035$). When the data were analyzed by position there was a statistically significant difference only for: 'Research information has resulted in a decision by

your organization to conduct program evaluations'. In this instance directors were much more likely to perceive that research information resulted in more program evaluations compared to senior health planners and clinicians ($P<.004$).

Discussion

The primary aim of this study was to identify information needs and preferences for research information, perceived barriers to using research evidence, and perceptions of use of research evidence among three organizations involved in delivering, improving access to, or making recommendations for, services for families with children with disabilities. It is believed that the findings of this inquiry may be applicable to other community-based health care settings. Similar findings have been reported among public health decision makers in Canada and the US. These studies have reported that public health professionals at all decision-making levels want quick and easy access to synthesized, high quality evidence that clearly articulates implications for policy and practice [5,27,40]. Given these findings it is likely that health care decision-makers engaged in the provision of health care services to individuals, families, groups, and populations in a variety of community-based settings, experience similar information needs and preferences to the ones reported in this paper. The findings reported in this paper will be particularly useful for health services researchers, especially those in the field of childhood disabilities and research-producing organizations that create research information applicable for use by community-based organizations.

One opportunity available in this study was the possibility to seek the perspectives of people working in three types of organizations whose roles and responsibilities, functions and relationships with *CanChild* differed considerably.

This afforded the chance to explore both common features across settings and variations by type of organization. It is not surprising that people working in the DHCs, which are research-focused organizations, often expressed different perspectives concerning their use of research evidence, barriers to use, and organizational culture, from practice-based respondents in the CTCs and CCACs. While it is somewhat intuitive that research-generating organizations would report greater use of research evidence in decision-making, it remains unclear if this is the result of research producers being more comfortable with the use of research evidence in general, or if the types of decisions they were engaged in lent themselves more easily to the incorporation of research evidence than those faced by the two more practice-based settings (CTCs and CCACs). Research has shown that the most commonly reported facilitators to the use of research evidence in policy-making are timeliness and relevance of the research, and research that includes a summary with clear recommendations [41,42].

Given that one of the roles of the DHCs was to influence provincial health policies by making recommendations for programs and services, and that DHC's self-reported use of research evidence was fairly high, one could conclude that the research evidence available for the treatment of childhood disabilities was relevant and adequate for the decision-making activities faced by DHCs. While it is not surprising that the DHCs reported higher use of research evidence in their decision-making, fewer barriers to its use, and an organizational culture more conducive to research use, this finding does imply that research-producers like the DHCs can also be important target audiences for research evidence. It would be prudent, therefore, for organizations like *CanChild* to develop collaborative relationships with organizations like the DHCs, so as to become more familiar with their information

needs and preferences, and then develop and implement KT activities to address these needs.

Between the latter two groups of respondents (CTCs and CCACs), there were also some observed differences that likely reflect, among other factors, the more fully established partnership between the CTCs and *CanChild*. The relationship between the CCACs and *CanChild,* while established, was still very new and given their role of coordinating a broad array of services within a complex mandate, the CCACs were not at that time perceived as a key target audience for *CanChild*'s Research Dissemination Program. It might be that greater interaction between researchers at *CanChild* and the CTCs explains why the CTCs generally reported greater ease of use of recently received research information, higher scores on the extent to which research information was actively sought before making decisions, and fewer perceived barriers to using research evidence in practice than the CCACs. These results are also supported by Innvaer et al, who found that personal contact between research producers and users was an important facilitator of research use [41].

However, these findings might also reflect that the available research evidence was more relevant and targeted at the type of decisions being made by those in the CTCs than those in the CCACs. For example, some of the Keeping Current pieces disseminated by *CanChild* focused on the effectiveness of clinical interventions for children with disabilities, as well as the merits of implementing family-centered care. These topics would be applicable not only to decisions clinicians faced in day to day practice, but also to managers and directors who might be in the process of improving and revising programs, and CEOs engaged in broad policy level decisions about service provision generally, or in how services could be organized. It is likely that the research evidence disseminated by *CanChild* at that time was more closely aligned

with the types of decisions encountered by the CTCs and therefore encouraged respondents to look for this evidence prior to making practice decisions. Similar findings have been reported by Dobbins et al. who reported that public health decision makers were significantly more likely to incorporate research evidence into program planning decisions when the evidence was very relevant to the decisions in which they were engaged [39,39]. Others have articulated that an important component of facilitating the use of research evidence is providing evidence to decision-makers that clearly answers their questions [43].

It could be argued, however, that the evidence disseminated by *CanChild* was more relevant for the CTCs because of the long-standing, collaborative relationship that existed between them. By working collaboratively over a number of years, the CTCs were equal partners in identifying research questions they needed addressed and *CanChild* developed a program of research focused on meeting these needs. More collaborative relationships between research users and producers have been advocated by many as a means of improving research transfer and uptake [3,24,43-46].

It is of course recognized that knowledge transfer is a complex phenomenon that includes more than simply getting the right information into the hands of the right people at the right time, and, equally important, that health care decision-making is influenced by a combination of clinical judgment, patient preferences, resources and research evidence [47-49]. However, these findings are noteworthy because they demonstrate the importance of research-producing organizations knowing not only who their target audience(s) are and what their needs are concerning research evidence, but also what questions they need answers to, and what kind of answers they need for different types of decisions. In order to know what target audiences want, need and require answers to, researchers and research-producing organizations

will need to invest significant effort in identifying their target audiences, developing a collaborative relationship with them, engaging meaningfully with them to develop research questions and designs, and working with them to interpret, translate and apply the results of research evidence into policy and practice. These same messages have been corroborated by others [3,45,50-52] who have advocated for enhanced collaborative relationships between research-producing organizations and intended research users.

The results reported in this study illustrate considerable consistency across organization type and position in relation to the preferred methods for receiving research information. There were no significant differences observed by level of decision maker, and only one difference observed by organization type, with DHCs preferring listservs as a method for receiving research information considerably more than either CTCs or CCACs. The top four methods preferred for receiving research information were websites, health-related research journals, electronic mail, and conferences/workshops. Some of these findings (electronic mail and websites) have been supported by others [5,11], while other research has shown limited preference for conferences/workshops. Generally, studies in this field have indicated that conferences are not an effective way of promoting knowledge transfer and uptake among health service decision-makers, policy-makers and practitioners [20,53,54]. It might be that conferences and workshops needed to be assessed separately in this study, and that participants preferred workshops that were interactive and developed with the needs of users in mind, as opposed to the traditional conference format.

Formats of research information preferred by participants in this study were first, executive summaries, followed by abstracts. The least preferred was full text original articles/reports. These findings continue to highlight that it is important to

frame research evidence in ways that are sensitive not only to the needs of various audiences, but also the available resources and skills of those audiences. Similar findings have been reported elsewhere [55-58]. Ely et al. suggest that evidence can be provided to primary care physicians at the point of care, but it is most useful when it has been digested into quickly accessible summaries. They further suggest that researchers need to frame their answers to research questions better, and that this would be accomplished by researchers becoming more familiar with the questions that occur in practice/policy making. In order to become more familiar with the research questions, researchers would have to engage in more meaningful dialogue with target users, which would be facilitated through the development of collaborative relationships [9,44,51].

Cogdill, 2003, explored the information needs and information seeking behaviours of nurse practitioners and found that education or outreach programs can be used to promote the use of information resources to retrieve evidence from clinical research to support various practice decisions. However, these programs must be developed in a way that builds on what is known about the clinician's information needs as well as how they resolve these needs. For example, a number of studies report that health professionals generally turn to other health professionals first to obtain information to resolve an information need [55,57-59], as opposed to written research reports.

In the study by Thompson et al. (2001), it was found that nurses accessed 'evidence-based' information sources in the context of continuing professional development and formal education or training. Other influences included being involved in the production of local protocols and guidelines and having to make sense of research such as clinical trials, or using research evidence to help resolve conflict

between colleagues [57]. The nurses in Thompson's study also articulated what made an information source, in this case usually clinical nurse specialists, useful: directly answered the question posed; seen to be authoritative and trustworthy, provided or could potentially provide a balance of 'background' (factual) knowledge as well as foreground (management) knowledge; provided supportive and unchallenging information; and had no or minimal associated need for critical appraisal.

Another implication of this observation is the need for researchers and research-producing organizations to 'translate' findings into plain language, devoid of the jargon with which researchers traditionally communicate within the field. Similar findings were reported by Dobbins et al. (2004) [5], in a study of public health decision-makers. In this national study, public health decision-makers indicated that what they needed most from public health researchers were two-page executive summaries that clearly communicated the issue from a local context, highlighted what the evidence was, and identified specific practice and policy implications for each evidence point.

An important barrier to implementing the suggestions made in this paper exists for academic researchers. The production of synthesized, relevant and applied research information that requires the sustainability of collaborative relationships between the researcher and target audiences in order to product these documents, has been less valued for promotion and tenure than peer-reviewed materials. One can only hope that as the imperative of knowledge transfer and exchange becomes more widely valued so too will these translation activities within academic centres. Work is currently ongoing to develop criteria upon which such activities can be included and evaluated for the purposes of tenure and promotion.

The findings of this study provide certain optimism for *CanChild* in relation to its knowledge transfer and exchange strategy. Generally *CanChild* is on its way to achieving its goal of promoting evidence-informed decision making among the CTCs in Ontario. These results also provide direction and guidance to *CanChild* concerning additional strategies that must be considered and implemented, as well as the identification and development of new collaborative relationships that must be fostered in order to fully realize their mandate.

Conclusions

The results of this study are useful to health services researchers and research-producing organizations, particularly those involved in producing research information relevant for community-based and childhood disability settings. While there were significant differences between the three types of organizations there was considerable similarity with respect to the identification of barriers to research transfer as well as the types of activities organizations engage in either to promote the use of research evidence and/or integrate research findings into program planning. Awareness of these issues will be particularly important for health services researchers in the coming years as pressure to demonstrate the translation of research knowledge into policy and practice becomes more important. The results of this study should provide a starting point upon which researchers could build an interactive, collaborative knowledge transfer strategy, as well as foster more inclusive relationships among researchers and health care decision-makers and professionals.

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

MD contributed to the conception and design of the study, development of the interview guide, interpretation of the data, and finalizing this manuscript. PR, the primary investigator, contributed to the study conception and design, obtained funding, finalized the data collection tools, oversaw data collection and analysis, and wrote the project report. NP contributed to the study design, development of data collection tools, interpretation of data, and provided feedback on the project report and manuscript drafts. ML contributed to the study conception and design, data interpretation, and provided feedback on the project report and manuscript drafts. AF was responsible for finalizing the data collection tools, participant recruitment, data collection and analysis, and reviewing the project report and manuscript drafts.

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Tables

Table 1 Characteristics of Participants

Variable	CTCs N (%)	CCACs N (%)	DHS N (%)	Total
Total Participation	28 (72)	38 (62)	26 (79)	91 (70)
Position				
CEO	12	14	9	35 (36)
Director/Manager	11	23	6	40 (38)
Senior Health Planner			11	11 (12)
Clinician	5	1	0	6 (6)

Table 2 Barriers to Using Research in Decision Making

What kind of office is it?	Mean	To what degree is lack of time a barrier to you in the access and use of research information for decision making?	To what degree are the organization's limited financial resources a barrier to you in the access and use of research information for decision making?	To what degree is the availability of relevant research information a barrier to you in the access and use of research information for decision making?	To what degree is your limited training or experience in evaluating the quality of research material a barrier to you in the access and use of research information for decision making?	To what degree is resistance to change at your organization a barrier to you in the access and use of research information for decision making?	To what degree is availability of research information a barrier to you in the access and use of research information for decision making?
N		91	91	90	91	90	91
CTC		3.5	2.5	2.5	2.5	1.6	1.9
CCAC		3.6	2.6	3.0	2.6	2.2	2.3
DHC		3.4	2.2	2.8	2.1	1.6	1.9
Overall		3.5	2.4	2.8	2.4	1.8***	2.0
	Std. Deviation	1.0	1.1	1.1	1.0	0.8	0.9
Executive director		3.4	2.7	2.9	2.5	1.9	2.1
Director		3.8	2.4	2.6	2.2	2.2	2.1
Manager		3.6	2.7	2.8	2.7	1.5	2.3
Senior health planner		3.5	2.1	3.0	2.4	1.7	2.1
Clinician		3.5	1.9	2.6	2.3	1.8	1.7
Overall		3.5	2.5	2.8	2.4	1.9	2.1
	Std. Deviation	0.9	1.1	1.1	1.0	0.8	0.9

* p<0.05
** p<0.01
*** p<0.001

Scale points and anchors (1 = Not an issue, 2= a minor issue, 3 = a moderate issue, 4= a serious issue, 5 =a very serious issue)

Table 3 Perceptions of Characteristics of the Organization

What kind of office is it?	Mean	My organization routinely, actively looks for research information before making decisions	My organization provides ongoing training in research methods and critical appraisal to staff.	Mechanisms exist in my organization that facilitate the transfer of new information into the organization.	Overall, my organization provides adequate resources (financial or personnel) to implement decisions that are based on scientific evidence.	Regulations and legislation greatly impact on the decisions my organization makes about programs. (Provincial and/or local)	Most program decisions made at my organization are made in collaboration with other local health institutions or community agencies.
N		91	89	89	87	88	88
CTC		3.8	2.6	4.21	3.5	4.1	3.5
CCAC		3.4	2.3	4.2	3.4	4.9	4.1
DHC		4.5	3.5	4.3	4.0	4.0	4.9
Overall		3.8***	2.8***	4.2	3.6*	4.4***	4.1***
	Std. Deviation	1.0	1.3	0.8	0.9	0.9	1.0
Executive Director		3.9	2.7	4.2	3.4	4.5	4.2
Director		4.0	3.1	4.4	3.7	4.4	4.4
Manager		3.3	2.1	4.3	3.4	4.9	3.8
Senior Health Planner		4.5	3.6	4.0	4.1	3.9	4.9
Clinician		3.8	2.5	4.0	3.9	4.2	3.5
Overall		3.8	2.8*	4.2	3.6	4.4	4.1**
	Std. Deviation	1.0	1.3	0.8	0.9	0.9	1.0

* p<0.05
** p<0.01
*** p<0.001

Scale Points and anchors (1= Strongly disagree, 2= moderately disagree,3 = neither agree nor disagree, 4 = moderately agree, 5 = strongly agree)

Table 4 Means Scores of Integrated Culture Scores by Organization

What kind of office is it?	Mean	N
CTC	3.6	27
CCAC	3.7	36
DHC	4.2	26
Overall	3.8**	89

* p<0.05
** p<0.01
*** p<0.001 Scale Points and anchors (1= Strongly disagree, 2= moderately disagree,3 = neither agree nor disagree, 4 = moderately agree, 5 = strongly agree)

Table 5 Preferred Methods for Receiving Research Information (% saying yes) (N=91)

Position	Website	Email	Newsletter	List Serv	Media Release	Health Related Journals	Professional Journals	Colleagues	Conferences/ Workshop	Short Summaries
% of sample preferring method	96.7	79.3	80.4	18.7	63.0	88.0	91.3	91.3	96.7	95.7
Executive Director	89	74.3	77.1	14.3	71.4	85.7	100	85.7	97.1	97.1
Director	79	83.3	88.9	16.7	50	94.4	88.9	100	100	100
Manager	86	78.6	92.9	7.1	57.1	92.9	100	85.7	92.9	71.4
SHP	91	90.1	63.6	36.4	90.1	81.8	81.8	90.1	90.1	91.1
Clinician	77	76.9	76.9	30.8	38.5	84.6	84.6	100	100	100
F	0.4	0.4	1.1	1.5	2.4	0.3	0.9	1.2	0.7	1.4
CTC	78.6	67.9	75	16.7	46.4	82.1	89.3	96.4	100	100
CCAC	86.5	78.4	89.2	5.4	67.6	91.9	91.9	89.2	94.6	94.6
DHC	88.5	92.3	73.1	46.2	73.1	88.5	92.3	88.5	96.2	92.3
F	1.4	2.5	1.8	19.5***	2.5	1.1	0.0	0.7	0.7	1.0

*SHP = Senior Health Planner
* $p<0.05$
** $p<0.01$
*** $p<0.001$

Table 6: Perception of Use of Research Information in Program Planning Decisions

What kind of office is it?		Research information has influenced program planning decisions at my organization	Research information has provided justification for service/program decisions made by my organization	Research information has resulted in a decision by your organization to conduct program evaluations	Research information has resulted in decisions to provide staff development training in your organization
CTC	Mean	4.1	4.2	3.0	4.0
CCAC	Mean	3.8	3.9	3.2	3.8
DHC	Mean	4.3	4.4	2.8	3.7
Overall	Mean	4.0	4.1*	3.0	3.8
	Std. Deviation	0.7	0.8	1.3	1.0
Executive Director	Mean	4.2	4.2	2.9	3.9
Director	Mean	3.9	3.9	4.0	3.9
Manager	Mean	3.7	3.9	2.9	3.7
Senior Health Planner	Mean	4.4	4.6	2.3	3.7
Clinician	Mean	3.9	3.9	2.7	3.7
Overall	Mean	4.0	4.1	3.0**	3.8
	Std Deviation	0.7	0.8	1.3	1.0

* $p<0.05$
** $p<0.01$
*** $p<0.001$ Scale Points and anchors (1= Strongly disagree, 2= moderately disagree,3 = neither agree nor disagree, 4 = moderately agree, 5 = strongly agree)