

A Pilot Study of Physical Activity Education Delivery in Diabetes Education Centres in Ontario

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A B S T R A C T

OBJECTIVE

To explore physical activity (PA) education delivery in Ontario Diabetes Education Centres (DECs).

METHODS

Semistructured telephone interviews were conducted with diabetes educators involved in PA education from 26 (55%) of 47 eligible centres. Frequency analysis was used to assess responses to closed questions, and qualitative analysis was used to investigate spontaneous comments about PA education content and delivery.

RESULTS

Respondents were 61.5% registered nurses, 23% registered dietitians, 7.7% kinesiologists and 7.7% others. All (100%) reported doing something to address PA education, including the following: exercise prescription (73%), PA-specific behavioural counselling (88%), PA follow-up (77%) and providing written materials (92%). However, a substantial proportion of educators did not feel comfortable with their own skills and training in this area.

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R É S U M É

OBJECTIF

Explorer la prestation de l'éducation en matière d'activité physique (AP) dans les centres d'enseignement pour personnes diabétiques (CEPD) de l'Ontario.

MÉTHODES

Des entrevues téléphoniques semi-structurées ont été menées auprès d'éducateurs spécialisés en diabète contribuant à l'éducation en matière d'AP dans 26 des 47 centres admissibles (55 %). On a procédé à une analyse de fréquence pour évaluer les réponses à des questions fermées et à une analyse qualitative pour évaluer les commentaires spontanés au sujet du contenu et de la prestation de l'éducation en matière d'AP.

RÉSULTATS

Les personnes interrogées étaient des infirmières autorisées (61,5 %), des diététistes professionnelles (23 %), des kinesiologues (7,7 %) et autres (7,7 %). Tous les répondants (100 %) ont dit prendre part à l'éducation en matière d'AP comme suit : recommandations de faire de l'exercice (73 %), counseling comportemental axé sur l'AP (88 %), suivi de l'AP (77 %) et remise de documentation (92 %). Toutefois, une grande proportion des éducateurs spécialisés en diabète ne se sentait pas à la hauteur dans ce domaine.

CONCLUSIONS

Il existe un manque de normalisation du contenu et de la prestation de l'éducation en matière d'AP dans les CEPD de l'Ontario, et de nombreux éducateurs spécialisés en diabète croient ne pas avoir les connaissances et la formation voulues pour faire du counseling axé sur l'AP.

MOTS CLÉS

Activité physique, éducateurs spécialisés en diabète, exercice.

CONCLUSIONS

There is a lack of standardization in the content and delivery of PA education in Ontario DECs, and many diabetes educators feel that they lack the skills and training related to PA counselling.

KEYWORDS

Diabetes educators, exercise, physical activity.

INTRODUCTION

One model of diabetes care delivery in Canada is the diabetes education centre (DEC), where patients diagnosed with diabetes receive the information and support they need to live with the disease. However, while the benefits of physical activity for people with type 2 diabetes have been well-established, people with diabetes report receiving less support, education and encouragement related to undertaking physical activity than for other areas of diabetes management, such as medication adherence, glucose testing and diet (1). We undertook the present study to explore the practices of diabetes educators related to physical activity education delivery within the context of DECs in the province of Ontario, Canada.

Overview of the literature

Physical inactivity is strongly associated with increased risk and incidence of cardiovascular disease and mortality in persons with type 2 diabetes (2-4). Aerobic exercise training directly improves blood glucose levels through both acute and chronic mechanisms, and lowers glycosylated hemoglobin to an extent associated with reduced risk of diabetes-related complications (5). In addition, aerobic exercise training has been found to improve cardiovascular risk factors associated with type 2 diabetes, such as lipid profile (6,7), hypertension (8) and abdominal obesity (9,10). Muscular strength training is also associated with improved glycemic control (11,12), and the effects of aerobic and resistance exercise on glycemic control are additive (13).

Despite evidence of the benefits of exercise, the majority of people with diabetes are not successfully using physical activity to improve their health. In the 1998/99 National Population Health Survey, 55.4% of people aged 20 years and over without diabetes reported being physically inactive, compared to 65.1% of people aged 20 years and over with diabetes (14). More recent data from an Alberta sample of 1614 people with type 2 diabetes (mean age 62.9 years) showed that 71.9% were insufficiently active (15).

The adoption of regular physical activity usually requires significant lifestyle change and is a difficult challenge for most people (16,17). This is especially true for people with type 2 diabetes, who are dealing with a multifaceted disease in which self-management involves adhering to a drug prescription; monitoring blood glucose levels; and modifying risk fac-

tors such as obesity, a high-fat/low-fibre diet, smoking and a sedentary lifestyle (18). In addition, people with diabetes are more likely than the general population to relapse to sedentary behaviour when attempting a lifestyle change (19).

The aim of DECs funded by the Ontario Ministry of Health and Long-Term Care (MOHLTC) is to facilitate patient self-management (20). The diabetes education team of healthcare professionals includes a physician, a nurse and a dietitian and may include a social worker, a clinical psychologist, a chiropractor, a pharmacist and/or a physiotherapist. The team is responsible for developing an individualized management plan for each patient (20).

According to the Canadian Diabetes Association (CDA) 2003 clinical practice guidelines, people diagnosed with diabetes are entitled to "comprehensive treatment services provided by qualified professionals" (18), and the diabetes healthcare team has the "responsibility to ensure that systematic, structured and standardized diabetes care is available" (18). The CDA clinical practice guidelines also recommend that evidence-based standards be implemented (e.g. people with type 2 diabetes should accumulate at least 150 minutes of moderate-intensity aerobic exercise per week on at least 3 non-consecutive days) (18). It is unknown whether physical activity education programming currently offered through DECs is consistent with the CDA clinical practice guidelines (18) and the Ontario MOHLTC diabetes education statement (20).

A study by Tudor-Locke and colleagues conducted with a convenience sample of 12 diabetes educators attending a weekend conference in 1998 found inconsistencies in physical education delivery (21). Respondents from this study were mostly dietitians who reported a lack of confidence about prescribing exercise and a reluctance to provide intensity guidelines; the influence of professional background on exercise delivery was not explored. Another study, conducted in 1993, found that registered nurse certified diabetes educators did not teach elderly patients about exercise because they lacked the physical activity knowledge, counselling skills and resources (22). A more recent study of dietitians' knowledge of physical activity and content of exercise programs for older adults with diabetes concluded that the education and experience of dietitians were key influences in the delivery of physical activity education programming;

registered nurses and kinesiologists were not included in this study (23). Results from the Canadian study by Tudor-Locke and colleagues (21) are perhaps not surprising given that in 1998, the evidence base for exercise was poor and all exercise-related recommendations in the CDA guidelines were Grade D (24). However, given that many important studies have been published since 1998 (25) and the evidence for exercise outlined in the 2003 CDA guidelines is far more robust (i.e. from Grade B to Grade D [18]), it is logical to expect a change in perceptions and practices of diabetes educators related to physical activity over the past decade. Nevertheless, a recent study of 85 DEC's across Canada by Bowman and Foster (26) suggests that the situation has not improved and that a lack of standardization exists across different domains of physical activity education delivery. The purpose of the current pilot study was to explore the delivery of physical activity education to people with type 2 diabetes in Ontario DEC's funded by the Ontario MOHLTC. In particular, we were interested in examining how educators from different professional backgrounds might differ in the way they approach physical activity with their patients.

METHODS

Participants

We identified 47 DEC's directly funded by the Ontario MOHLTC. Over a 4 week period from mid-January to mid-February 2005, program coordinators from each of the 47 DEC's were contacted by email and/or telephone and asked to provide contact information for the diabetes educator responsible for physical activity education in their centre. Educators from 26 of the 47 centres responded to our invitation for an interview. Twenty-one education programs were not included because the program coordinator or diabetes educator did not respond ($n=16$) or was unavailable ($n=5$) during the 4 week data collection period. Where physical activity education responsibilities were shared, we interviewed the person with primary responsibility for and/or a thorough understanding of physical activity education delivery in the DEC. This resulted in telephone interviews conducted with 26 respondents, all women, from different DEC's in Ontario. All respondents provided informed consent. The research protocol was approved by the Queen's University unit research ethics board.

Measures and procedure

Conceptual framework

A semistructured interview protocol was formulated to reflect the content areas of current recommendations found in the Ontario MOHLTC statement on DEC's (20) and the physical activity recommendations specified in the CDA clinical practice guidelines (18). Questions addressed physical activity education delivery and content, as well as respondent background and training. In order to ensure a common understanding of terms among respondents, definitions

were provided (e.g. exercise prescription is "the delivery of a specific instruction that outlines exercise type, intensity, frequency and duration to be followed by the patient"). Interview questions assessed the format of physical activity education delivery (exercise prescription, physical activity-specific behavioural counselling, follow-up) and the content of physical activity education (tailoring, specifically addressing aerobic and resistance exercise). Respondents were also asked about the written materials they provided to patients (e.g. *Canada's Physical Activity Guide for Healthy Active Living* [27]). All questions concerning education delivery and content required a "yes" or "no" reply. Respondents were encouraged to elaborate on their responses and add any information they deemed relevant. Qualitative data are thus the result of spontaneous comments and not of exhaustive systematic probing. Telephone interviews lasted between 10 and 20 minutes, during which time a trained interviewer took notes.

Data analysis

Frequency analysis was used to assess responses to closed questions and to describe the background and training of diabetes educators. Qualitative information was used in conjunction with frequency information to capture themes related to physical activity education in Ontario DEC's. Specifically, qualitative data were analyzed following the method proposed by Ritchie and colleagues (28). First, a thematic framework was constructed based on the directions and recommendations cited by the Ontario MOHLTC (20) and the CDA clinical practice guidelines for physical activity (18). This framework served to organize data into 2 higher-order categories regarding physical activity education content and delivery, and the background of diabetes educators. Next, an index of recurring sub-themes was constructed, and each sub-theme was grouped according to its higher-order category. Once the sub-themes were grouped, the higher-order categories were refined into 4 major themes: physical activity education delivery and content, background and training of diabetes educators, external resources for physical activity education and current quality, and needs in physical activity education. Raw data were then reviewed and labelled according to relevant sub-theme(s). For example, when a respondent reported that the level of detail provided in an exercise prescription "depends on the patient," her statement was grouped under the sub-theme "protocols for individualizing physical activity education," which falls under the major theme "physical activity education delivery and content." Each labelled statement was charted (grouped) according to sub-theme, and the qualitative data were summarized in the results. Consensus on the qualitative results was achieved through discussion and revision by the first 2 authors.

RESULTS

Quantitative and qualitative results are presented together and organized by major theme. For each of the 4 major themes,

qualitative data are used to elucidate findings from the frequency analyses and presented under sub-theme headings.

Theme 1: Physical activity education delivery and content

Frequency results from the closed questions addressing the distribution of written materials, the format of physical activity education delivery (exercise prescription, behavioural counselling and follow-up) and the content of exercise prescription are presented in Table 1.

Description of physical activity education delivery

All respondents (100%) reported addressing physical activity in diabetes education in some form or another, although exercise was often described as “encouraged” rather than prescribed. Regardless of whether or not they considered themselves to “prescribe” exercise, several diabetes educators cited making physical activity recommendations based on the CDA clinical practice guidelines (18). Behavioural counselling was reported to be offered in group and/or one-on-one sessions and to be either one-size-fits-all or individualized. Follow-up might involve drop-in sessions or appointments, and there was great variability in the scheduling of follow-up sessions.

Protocols for individualizing physical activity education

Protocols for providing physical activity education to individual patients typically involved 1 of 2 different strategies.

Physical activity recommendations and exercise prescriptions were either tailored (patient-driven) or targeted (one-size-fits-all for people with type 2 diabetes). For example, the extent and content of physical activity education could be based on ability/medical status, dictated by patient willingness and/or involve in-depth individual assessment (i.e. tailored), or it might simply follow a standard flow chart or checklist (i.e. targeted). Physical activity recommendations based on the CDA clinical practice guidelines (18) might or might not be individualized. Some respondents reported offering exercise prescriptions or written materials about physical activity only when they “believed the patient should have it.” Other respondents cited using guidelines and checklists with all patients when delivering physical activity education.

Theme 2: Background and training of diabetes educators

Respondents identified themselves as holding 1 of 3 main job titles: registered nurse (n=16), registered dietitian (n=6) or kinesiologist (degree in kinesiology, n=2). Two respondents coordinated the work of more than 1 registered nurse and/or registered dietitian to deliver physical activity education. Some also mentioned having additional training and/or experience relevant to physical activity education, such as a personal interest in physical activity, fitness instructor training, cardiac rehabilitation training and/or First Step Program training (29,30).

Category	Question	Yes n (%)	No n (%)	Uncertain n (%)
Delivery of written materials regarding physical activity (n=26)	Patients given the <i>Canadian Physical Activity Guide for Healthy Active Living</i>	16 (62)	5 (19)	5 (19)
	Patients provided with written material about physical activity or exercise specific to people with diabetes	19 (73)	5 (19)	2 (8)
	Patients given either or both of the above	24 (92)	0 (0)	2 (8)
Format of physical activity education delivery (n=26)	Offers exercise prescription (specific instruction that outlines exercise type, intensity, frequency and duration to be followed by patient)	19 (73)	7 (27)	0 (0)
	Offers behavioural counselling for physical activity (instruction on how to incorporate physical activity into life and make permanent lifestyle changes)	23 (88)	0 (0)	3 (12)
	Offers follow-up with patients who receive exercise prescription or behavioural counselling	20 (77)	1 (4)	5 (19)
Physical activity education content (n=19)	Offers individualized exercise prescription	16 (84)	2 (11)	1 (5)
	Addresses cardiovascular fitness training	17 (89)	0 (0)	2 (11)
	Addresses muscular strength training*	14 (74)	3 (16)	2 (11)

*Due to rounding, percentages add up to 101

Physical activity education by educators with different training

The two diabetes educators with a background in kinesiology emphasized individualized exercise prescriptions to target specific needs, goals, barriers and current physical activity involvement. Their patients received one-on-one physical activity education and/or were referred to another exercise specialist. Educators trained in kinesiology cited their background as influential in their ability to provide comprehensive physical activity education. In contrast, descriptions of physical activity education delivery and content by nurse and dietitian educators varied extensively. For example, some did not follow a formal physical activity education program, while others included physical activity education “sometimes,” and others collaborated with an exercise specialist.

Theme 3: External resources for physical activity education

A minority of diabetes educators (38%) had access to at least 1 type of external physical activity education resource (i.e. other professionals, physical activity programs, physical activity facilities). A physiotherapist or a physiotherapist assistant was reported to be involved in physical activity education by 5 respondents and available for referral by 2 additional respondents. Four DEC were co-located with a physiotherapy clinic or hospital, 1 DEC was near a university, 1 was located within a community health centre and 4 had a partnership with the local YMCA/YWCA.

Physiotherapist involvement in DEC physical activity education

Activities conducted by physiotherapists who came into the DECs included discussing physical activity in group sessions, reviewing physical activity recommendations, making physical activity suggestions for patients with physical limitations and/or administering foot assessments. None of the respondents identified a physiotherapist as the primary provider of physical activity education. Physiotherapists available for referral were not directly involved in physical activity education in the DEC but were cited as accessible given the clinic/program location or affiliation with the DEC.

Access to physical activity programs/facilities and other professionals

Diabetes educators identified DEC co-location and/or affiliation with external resources as affecting the physical activity education they were able to provide. Co-location of a DEC with a physiotherapy clinic was reported to enable easy patient referral to physiotherapists for exercise prescription and program design. Proximity to a university was reported to allow access to kinesiologists and other exercise specialists at the university, patient involvement in physical activity intervention research programs and access to university exercise equipment. Location of a DEC within a

community health centre was reported to facilitate physical activity education because patients had direct access to free physical activity programs run through the centre. Diabetes educators at DECs that were partnered with YMCA/YWCA fitness facilities cited encouraging patients to make use of the facilities to become more active.

DEC proximity to a cardiac rehabilitation program might also influence physical activity education in the DEC. Some respondents explained that proximity allowed exercise specialists primarily employed in cardiac rehabilitation to be involved in DEC physical activity education. Educators cited cardiac rehabilitation programs as more prepared for physical activity education and performance, given the presence of an exercise specialist and the availability of exercise equipment. However, many cardiac rehabilitation program resources are made available to DEC patients only once they have experienced a cardiovascular event, even when facilities are located nearby.

Theme 4: Current quality and needs in physical activity education

When invited to elaborate on their answers to the closed interview questions, many respondents identified shortcomings/needs with respect to the physical activity education delivery offered in their DEC. Specifically, 11 respondents (42%) (7 registered nurses, 4 registered dietitians) spontaneously mentioned a lack of adequate physical activity-related training, a need for a physical activity specialist and/or a need for more physical activity resources. Nonetheless, when consulting with patients, 8 of these 11 respondents (73%) reported providing individualized exercise prescriptions, 7 (88%) reported addressing cardiovascular fitness training and 3 (38%) reported addressing muscular strength training. All (100%) of these educators reported offering behavioural counselling specific to physical activity, and 9 (82%) reported offering follow-up to exercise prescription and/or behavioural counselling.

Lack of training

Several diabetes educators cited not having enough training to properly provide physical activity education. Respondents often refrained from prescribing exercise or making recommendations, reporting concerns about increasing risk to the patient. Fear of increasing risk was deemed a major barrier to exercise prescriptions or recommendations, especially when addressing exercise intensity. Several educators reported referring patients to their physicians for muscular strength training information rather than providing it at the DEC.

Need for an exercise specialist in the DEC

Diabetes educators reported a need for an exercise specialist to be involved in physical activity education in their DEC. Educators repeatedly mentioned that a kinesiologist was needed and was even the “missing link” in diabetes education.

Many of the educators who reported a need for an exercise specialist already had a physiotherapist involved in physical activity education or had access to an exercise specialist outside the DEC.

Need for more physical activity resources

Several diabetes educators cited a need for more physical activity resources, including exercise equipment/facilities for safe activity demonstrations, more external resources such as affiliations with physiotherapy clinics, more bilingual (i.e. English and French) information regarding physical activity and diabetes, and more partnerships with YMCA/YWCA fitness facilities.

DISCUSSION

Given an improved evidence base about the benefits of physical activity involvement for people with diabetes (13), the wide circulation of the 2003 CDA guidelines (18) and the lack of knowledge about how educators from different professional backgrounds might differ in the way they address physical activity with their patients, this study sought to investigate physical activity perceptions and practices of diabetes educators with diverse training backgrounds. Overall, findings show that although a vast majority of educators appear to be doing something to address the issue of physical activity with their patients, little progress has been made in the past decade relative to the standardization of physical activity education delivery for people with diabetes. Findings also reveal a need for more physical activity training for diabetes educators, further investigation of additional physical activity education training and experience reported by some educators, and a need for more physical activity resources in diabetes education.

According to the Ontario MOHLTC statement on DECs, nurses and dietitians are a core part of the diabetes education team (20), and not surprisingly most educators in this study were registered nurses or dietitians. The only exercise specialists mentioned in the Ontario MOHLTC statement on DECs are physiotherapists. However, the role of the physiotherapist in diabetes education is not well defined, as there are many streams of physiotherapy and not all physiotherapists can be considered exercise specialists. We found that when they were involved, physiotherapists were not primary providers of physical activity education, acting as a secondary source instead. The CDA clinical practice guidelines (18) list 17 types of healthcare professionals who can be involved in diabetes education and treatment, none of whom can be considered an exercise specialist. Despite being omitted from the list of healthcare professionals, kinesiologists were found to be involved in some diabetes education programs. Their involvement, and the fact that these educators attributed their ability to provide comprehensive physical activity education to their training in kinesiology, suggests that exercise specialists may have a greater role to play in diabetes education than

either the Ontario MOHLTC (20) or the CDA clinical practice guidelines (18) currently acknowledge. Further research is needed to determine if there is a need for kinesiologists to be a part of the core diabetes management team.

Access to external resources was found to be yet another factor distinguishing physical activity education delivery across DECs. DECs located near university facilities, physiotherapy clinic professionals and facilities, community health centre programs and YMCA/YWCAs were able to offer enhanced physical activity education through partnerships with these institutions/organizations. Although some diabetes educators were able to access cardiac rehabilitation resources, being co-located with a cardiac rehabilitation program did not necessarily grant DEC patients access to exercise specialists or facilities, unless they experienced a cardiovascular event. Given that cardiovascular events are the cause of death for most people with diabetes (31) and exercise-based cardiac rehabilitation has been proven effective in reducing all-cause mortality from cardiovascular disease (32), further consideration of enhancing the accessibility of these resources for all patients with diabetes may be warranted.

The specificity of physical activity instruction and adherence to CDA clinical practice guidelines for physical activity (18) were inconsistent across DECs. These results are similar to those reported by Tudor-Locke and colleagues (21) and Bowman and Foster (26), who found a majority of educators addressing physical activity education, but with a great deal of variability. Protocols for individualizing patient education differed among educators, possibly reflecting the fact that there is not yet a widely accepted, evidence-based model for implementing systematic, structured and standardized physical activity education for people with diabetes.

Our results suggest that diabetes educators recognize the importance of both cardiovascular and muscular fitness training for people with type 2 diabetes. However, consistent with previous findings (21,26), they also mentioned concerns about increasing patient risk by recommending or prescribing physical activity. This was especially the case with respect to prescribing resistance training. As reported in the Tudor-Locke study (21), educators were least comfortable with prescribing exercise intensity and were less likely to encourage resistance training. In such cases, diabetes education is not living up to the current evidence-based CDA clinical practice guidelines (18), and responsibility for physical activity education may be transferred to the physician, who is not necessarily qualified or available to provide physical activity education either (33–35). It has been suggested that a new category of professional with training in lifestyle intervention is needed in type 2 diabetes treatment (33). It is likely that those responsible for physical activity education in people with type 2 diabetes will need to understand the physiological effects of exercise and its implications for a person with diabetes, and also be able to effectively promote behaviour

change and adherence to regular physical activity. Further research is needed to determine what an effective standardized model of physical activity education delivery should include in terms of personnel, resources and programming.

Results from this pilot study should be considered preliminary given the modest response rate, likely attributable to the brief 4 week data collection period. Diabetes educator self-selection bias is another limitation. It is possible that diabetes educators who were implementing strategies in physical activity education were more likely to have consented to the interview than those who were doing less in this regard. Another limitation is the non-exhaustive exploration of themes emerging from the qualitative data. Responses were not systematically probed with each educator; however, because responses were spontaneous, it is likely that the information provided was considered to be important by the participant.

CONCLUSION

This pilot study provides updated information on the current practices of diabetes educators related to physical activity education in Canada's largest province, which is highly relevant to the care of people with diabetes in Canada. Results provide an optimistic picture, with most diabetes educators reporting that they address physical activity education, but standardization in the content and delivery of physical activity education is still an area in need of improvement. In many cases, diabetes educators feel ill-trained and ill-qualified to deliver physical activity education. This finding in particular warrants enhanced attention, given that physical activity education training and a role for the physical activity expert in the diabetes management team has yet to be formally recommended (18,20). Information from this pilot study will help lay the groundwork for future investigations into enhancing the delivery of physical activity education to people with diabetes.

AUTHOR DISCLOSURES

No dualities of interest declared.

AUTHOR CONTRIBUTIONS

AG was responsible for obtaining ethics approval, developing the interview protocol, collecting, analyzing and interpreting the data and cowriting the manuscript. LL was responsible for the conceptual design of the overall study, interpretation of results and cowriting the manuscript. RJS contributed to the interpretation of results and critically reviewed the manuscript for important intellectual content. All authors have read and approved the final manuscript.

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