Can J Diabetes 38 (2014) 423–431

Contents lists available at ScienceDirect

Canadian Journal of Diabetes

journal homepage: www.canadianjournalofdiabetes.com

Original Research

Implementation of Resources to Support Patient Physical Activity through Diabetes Centres in Nova Scotia: The Effectiveness of Enhanced Support for Exercise Participation

Jonathon R. Fowles BSc, MSc, PhD [a,*], Chris Shields BSc, MSc, PhD [a], Lisette d'Entremont BKinH [a], Stephanie McQuaid BKin, K [a], Brittany Barron BKinH [a], Peggy Dunbar BSc, MEd [b]

[a] Acadia University, Wolfville, Nova Scotia, Canada
[b] Diabetes Care Program of Nova Scotia, Halifax, Nova Scotia, Canada

ARTICLE INFO

Article history:
Received 10 December 2013
Received in revised form
10 February 2014
Accepted 11 February 2014

Keywords:
action research
Diabetes Centres
exercise
Nova Scotia
physical activity
Toolkit
type 2 diabetes

ABSTRACT

Objective: The purpose of this study was to determine the effectiveness of enhancing support for physical activity counselling and exercise participation at diabetes centres in Nova Scotia on physical activity and exercise behaviours and clinical outcomes in patients with type 2 diabetes mellitus.
Methods: In all, 180 patients at 8 diabetes centres participated in this observational study. A range of enhanced supports for exercise were offered at these centres. A kinesiologist was added to the diabetes care team to primarily provide extra physical activity counselling and exercise classes. Patient physical activity and exercise levels, efficacy perceptions and mean glycated hemoglobin (A1C) were evaluated at baseline and 6 months. We compared changes in these variables for patients who participated in the enhanced supports versus patients who did not.
Results: Participants who attended exercise classes (n=46), increased moderate physical activity by 27% and doubled resistance exercise participation (1.0±1.8 to 2.0±2.1 days per week) whereas those who did not attend exercise classes (n=49) reduced moderate physical activity by 26% and did not change resistance exercise participation (interactions, p=0.04 and p=0.07, respectively). Patients who received resistance band instruction (n=15) from a kinesiologist had reductions in A1C (from 7.5±1.4 to 7.1±1.2; p=0.04), whereas other subgroups did not have significant changes in A1C.
Conclusions: Offering enhanced support for exercise at diabetes centres produced improvements in physical activity and exercise in type 2 diabetes patients. Resistance band instruction from a kinesiologist combined with participating in a walking and resistance training program improved glycemic control, which underscores the importance of including exercise professionals in diabetes management.

Mots clés :
recherche participative
centres du diabète
exercice
Nouvelle-Écosse
activité physique
boîte à outils
diabète de type 2

RÉSUMÉ

Objectif : L'objet de cette étude était de déterminer l'efficacité de l'amélioration du soutien au counseling en activité physique et à la participation à l'exercice des centres du diabète de la Nouvelle-Écosse sur le plan des comportements en matière d'activité physique et d'exercice, et des résultats cliniques chez les patients souffrant du diabète sucré de type 2.
Méthodes : En tout, 180 patients de 8 centres du diabète ont participé à cette étude observationnelle. Ces centres ont offert un éventail de services améliorés de soutien à l'exercice physique. Un kinésiologue additionnel s'est joint à l'équipe de soins du diabète pour essentiellement offrir un counseling supplémentaire en matière d'activité physique et des séances d'exercice. Les niveaux d'activité physique et d'exercice des patients, les perceptions d'efficacité et l'hémoglobine glyquée moyenne (A1c) ont été évalués au début et après 6 mois. Nous avons comparé les changements obtenus dans ces variables chez les patients qui avaient participé aux services améliorés de soutien *versus* les patients qui n'y avaient pas participé.
Résultats : Les participants qui avaient assisté aux séances d'exercice (n=46) ont accru de 27 % leur activité physique modérée et doublé leur participation à l'exercice contre résistance (de 1,0±1,8 à

* Address for correspondence: Jonathon R. Fowles, PhD, School of Kinesiology, 550 Main Street, Acadia University, Wolfville, Nova Scotia B4P 2R6, Canada.
E-mail address: jonathon.fowles@acadiau.ca

1499-2671/$ – see front matter © 2014 Canadian Diabetes Association
http://dx.doi.org/10.1016/j.jcjd.2014.02.008

2,0 ± 2,1 jours par semaine), tandis que ceux qui n'avaient pas assisté aux séances d'exercice (n=49) ont diminué de 26 % leur activité physique modérée et n'ont pas modifié leur participation à l'exercice contre résistance (interactions, p=0,04 et p=0,07 respectivement). Les patients qui avaient reçu d'un kinésiologue des instructions sur l'utilisation de la bande élastique (n=15) ont obtenu des réductions de leur A1c (de 7,5±1,4 à 7,1±1,2; p=0,04), tandis que les autres sous-groupes n'ont pas eu de changements significatifs de leur A1c.

Conclusions : Les centres du diabète qui offraient un service amélioré de soutien à l'exercice ont contribué à améliorer le niveau d'activité physique et la participation à l'exercice des patients souffrant du diabète de type 2. Les instructions données par un kinésiologue sur la bande élastique et la participation à un programme de marche et d'entraînement musculaire ont amélioré la régulation glycémique, ce qui met en évidence l'importance d'intégrer les professionnels de l'exercice physique à la prise en charge du diabète.

Introduction

Regular physical activity and exercise are effective treatments for the management of type 2 diabetes (1,2), resulting in improvements in glycemic control, cardiometabolic outcomes and improved quality of life (1–6). Although physical activity and exercise are terms often used interchangeably, they outline different behaviours (2) and, therefore, have different levels of participation and different outcomes (1). Exercise is planned, structured physical activity. The benefits are greater when patients achieve at least the recommended levels of 150 minutes of moderate to vigorous aerobic exercise per week (1,2,7–10), engage in greater volume or intensity of resistance exercise (3,11,12) or when both aerobic and resistance exercise are combined (3,8,13–15). The great majority of patients with type 2 diabetes do not achieve the recommended guidelines for physical activity, and reported exercise is lower. Although 55% to 60% of patients with type 2 diabetes report "walking" for physical activity (16,17), only 21% to 28% of type 2 diabetes patients in Canada report meeting the threshold of 150 minutes of moderate aerobic physical activity or exercise per week (16–19), only 12% to 13% report performing weight training or machine exercise (17), and it is likely that fewer meet both aerobic and resistance exercise guidelines. It is clear that there is a major challenge in clinical practice to help clients achieve target levels of physical activity or exercise (20).

Recent research has confirmed that supervised gym-based exercise is superior to physical activity counselling (7,10,21) or home-based exercise (22,23) for most outcomes persons with diabetes. Although these types of intensive interventions have been shown to be cost effective (24,25), these approaches have been difficult to implement in clinical practice because of the time pressure to include them on top of regular clinical work, the lack of access to facilities and equipment and the lack of exercise expertise by diabetes care professionals (19,26,27). Most diabetes centres in Canada do not have access to qualified exercise professionals or resources for structured supervised exercise (20), and many diabetes patients may not want to partake in structured exercise on their own at a local fitness centre (16).

Recognizing the evidence supporting that more intensive interventions facilitate the attainment of exercise guidelines and the challenges associated with implementing many of these programs, we sought to determine the effect of enhanced support for exercise at diabetes centres, primarily through the contact of a qualified exercise professional (kinesiologist or personal trainer or trained diabetes educator) by the diabetes care team. The enhanced support included extra physical activity counselling, resistance exercise instruction, exercise classes (group walking and resistance band training) or referrals to community exercise centres and programs. This "enhanced" support was a supplement to physical activity counselling by a diabetes educator using the Diabetes Physical Activity and Exercise Toolkit (28), the outcomes of which are described separately (29,30).

This study was part of an action research program. Action research involves the process of engaging in a change in the professional practice by a group or organization while concurrently conducting research on the process and outcomes of that change, with the goal of improving the way a specific issue or problem is addressed (31). In the context of this study, researchers were responding to the needs identified by the Diabetes Care Program of Nova Scotia and practitioners in the field for greater exercise support. The current evaluation was done to determine the overall effectiveness of free will participation in these services and the results for patients who took advantage of the enhanced support versus those who did not. We hypothesized that provision of enhanced support for exercise would improve exercise participation by patients at the diabetes centres, and that persons who participated in enhanced support, and exercise classes in particular, would report greater levels of physical activity and exercise behaviour and show improved glycemic control.

Methods

Design

Ethics approval for this study was obtained through Acadia University Research Ethics Board and the respective District Health Research Ethics Boards. A pre-post observational design was used to evaluate the effectiveness of providing enhanced support for exercise at diabetes centres in Nova Scotia. There was no randomization to groups as the focus of the research was to identify how much uptake would actually occur and how potent the outcome could be if offered as part of regular clinical practice. Enhanced support was encouraged throughout the province, in addition to toolkit-based physical activity counselling that had already been disseminated in the province previous to the current study (28) and is now considered part of quality diabetes care as it has been adopted by the Canadian Diabetes Association as a primary diabetes education resource (32). The Diabetes Care Program of Nova Scotia encouraged all diabetes educators to incorporate more physical activity and exercise counselling into clinical practice as best as possible based on the diabetes educator's own demands on time, resources and care objectives; however, this evaluation project with external funding for enhanced exercise support was done at 8 of 38 diabetes centres in Nova Scotia.

At the 8 diabetes centres in Nova Scotia, diabetes educators identified a convenience sample (n=180) by approaching patients (approximately 1 of every 5 type 2 diabetes patients on regularly scheduled visits who had not previously received physical activity counselling from a diabetes educator) to determine interest to