PRIMARY CARE DIABETES XXX (2017) XXX–XXX

Contents lists available at ScienceDirect

Primary Care Diabetes

journal homepage: http://www.elsevier.com/locate/pcd

Review

Interventions for prevention of type 2 diabetes in relatives: A systematic review

Elena Dimcheva Dimova[a,*], *Andrea Rene Mary Mohan*[a], *Vivien Swanson*[b], *Josie M.M. Evans*[a]

[a] *Faculty of Health Sciences and Sport, University of Stirling, FK9 4LA, Scotland, UK*
[b] *Faculty of Natural Sciences, University of Stirling, FK9 4LA, Scotland, UK*

ARTICLE INFO

Article history:
Received 2 February 2017
Received in revised form
7 April 2017
Accepted 10 April 2017
Available online xxx

Keywords:
Type 2 diabetes
High-risk groups
Relatives
Review
Randomized-controlled trials

ABSTRACT

The relatives and partners of people with type 2 diabetes are at increased risk of developing type 2 diabetes. This systematic review examines randomized controlled trials, written in English that tested an intervention, which aimed to modify behaviors known to delay or prevent type 2 diabetes, among the relatives or partners of people with type 2 diabetes. Study quality was assessed using the Cochrane Collaboration's tool for assessing risk of bias. Seven studies met the inclusion criteria. The majority of studies were at low risk of bias. Six studies tested an intervention in first-degree relatives of people with type 2 diabetes and one in partners. Intervention components and intervention intensity across studies varied, with those targeting diet and physical activity reporting the most significant changes in primary outcomes. Only one study did not observe significant changes in primary outcomes. There were three main recruitment approaches: advertising in the community, recruiting people through their relatives with diabetes, or identifying people as high risk by screening of their own health care contacts. Some evidence was found for potentially successful interventions to prevent type 2 diabetes among the relatives and partners of people with type 2 diabetes, although finding simple and effective methods to identify and recruit them remains a challenge. Future studies should explore the effect of patients' perceptions on their family members' behavior and capitalize on family relationships in order to increase intervention effectiveness.

Contents

* *Corresponding author.*
E-mail addresses: elena.dimova@stir.ac.uk, elena.dimova89@gmail.com (E.D. Dimova).

http://dx.doi.org/10.1016/j.pcd.2017.04.003
1751-9918/

1. Introduction

First-degree relatives of people with type 2 diabetes are at increased risk of developing this condition, with offspring and siblings at a three-fold higher risk than the general population [1–3]. This increased risk has genetic and environmental components, the latter likely arising from shared risk factors such as sedentary lifestyle, physical inactivity and obesity [4]. Cohabiting partners are also at high risk from these shared risk factors [5]. Prevention studies in people at high risk provide compelling evidence that type 2 diabetes can be prevented or delayed with lifestyle modifications, such as increase in physical activity and healthy diet, and weight loss [6–10]. Identifying and intervening in the relatives of people with type 2 diabetes is important and could therefore form part of an effective diabetes prevention strategy [11–13].

For diabetes prevention among relatives and partners of people with type 2 diabetes to form part of such an intervention strategy, the feasibility of identifying and recruiting these high-risk people needs to be established. In terms of intervention effectiveness, only one narrative review to date has synthesized evidence on interventions to reduce the risk of type 2 diabetes in people with a family history [7]. This review included studies of different designs, but it did not assess study quality and neither did it synthesize evidence relating to partners of people with this condition. The authors concluded that health promotion in people with family history of type 2 diabetes is under-researched and family history is rarely used to initiate or promote behavior change. The current systematic review therefore examines published randomized-controlled trials (RCTs) in order to identify successful recruitment and intervention strategies for type 2 diabetes prevention in relatives and partners of people with type 2 diabetes.

2. Methods

2.1. Search strategy and information sources

The selected databases were MEDLINE, PsychINFO, CINAHL, ASSIA and ProQuest and search terms included "random* control* trial*", "RCT", "type 2 diabetes", "non-insulin dependent diabetes", "NIDDM", "family+", "spouse*", "partner*", "sibling*", "parent*" and "offspring*". All databases were searched from inception until August 2016. The reference lists of all included studies were then searched by hand to identify any additional relevant studies.

2.2. Study selection

RCTs were included if they aimed to modify behaviors known to delay or prevent type 2 diabetes (e.g. physical activity, healthy diet) that were delivered to the relatives and/or partners of people with type 2 diabetes. Studies were excluded if they were not RCTs, if they were feasibility studies or protocols, or if the participants did not have a relative/partner with type 2 diabetes (or if this was not reported). Inclusion/exclusion criteria were applied in a two-step process, screening titles and abstracts before screening full text (Fig. 1). The search identified one trial, which was delivered to patients but explored the indirect intervention effect on the patients' partners [14]. A decision was made to include the study, as partners of people with type 2 diabetes are at increased risk of type 2 diabetes and they remain understudied. The additional hand search through the reference lists of included articles identified a narrative review [12] that led to the addition of one study not identified by the initial search strategy [15–18]. Although not an RCT, this study was included as participants were randomized into treatment groups through the process of minimization [19]. Minimization is based on the principle of randomization although participants are allocated to treatment groups on the basis of specific characteristics such as gender or BMI. This method is appropriate for controlled trials with small samples because it minimizes the imbalance between different factors [19].

Data extraction was carried out by ED, with included studies then checked against inclusion criteria by AM. Information was collected on author and year, population sample, recruitment methods, intervention components and mode of delivery, intervention duration and study outcomes. Intervention components were classified according to the Behavior Change Taxonomy [20]. This was done independently by two of the authors (ED and AM).

2.3. Assessment of study quality

Study quality was assessed using the Cochrane Collaboration's tool for assessing risk of bias [21]. The tool allows the researcher to assess risk of bias across several domains and provides a systematic and transparent method of assessing the internal validity of a study [21]. Assessors are required to assign "high risk", "low risk" or "unclear risk" of bias, based on the sources of bias, which include random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data and selective reporting. The tool also provides an

Please cite this article in press as: E.D. Dimova, et al., Interventions for prevention of type 2 diabetes in relatives: A systematic review, Prim. Care Diab. (2017), http://dx.doi.org/10.1016/j.pcd.2017.04.003