Contents lists available at ScienceDirect

Primary Care Diabetes

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

Original research

Diabetes prevention program in a Mediterranean environment: Individual or group therapy? An effectiveness evaluation

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ARTICLE INFO

Article history:
Received 23 February 2014
Received in revised form
30 June 2014
Accepted 13 July 2014
Available online 20 August 2014

Keywords:
Diabetes prevention
Pre diabetes intervention
Individual therapy
Group therapy

ABSTRACT

Introduction: Diabetes as a multifactorial disorder requires prevention measures based upon the modification of several risk factors simultaneously; otherwise, there is insufficient potential for prevention. Following the success of the American Diabetes Prevention Program (DPP), we implemented an intervention program in a large Israeli healthcare organization with an emphasize on Mediterranean Diet (MedDiet) and physical activity.

The objective was to evaluate the effectiveness of two types of intervention, individual and group therapies, in reducing risk factors and in preventing or delaying the development of type 2 diabetes.

Methods: Out of 180 primary care physicians, 85 who agreed to participate, were randomly assigned, between the years 2005 and 2006, into two groups: those who would refer pre-diabetes adult patients for individual therapy and those who would refer for group therapy. The two groups of patients consisted of 111 and 112 in each group. The intervention lasted for 6 months and discussed: the benefits of MedDiet, planning nutritional behavior and mindful eating, and the importance of physical activity. All patients were invited to participate in walking groups. Follow up lasted for 24 months and logistic, mixed models, and Cox regressions were employed.

Results: No statistically significant differences were detected between the two intervention groups in age; gender and clinical measurements at recruitment. Thirty nine percent of both groups developed diabetes (entered the DR by 2012), including 38.7% from the individual therapy and 39.3% from the group therapy ($P = 0.933$). The mean time from 2005 until entry to the Diabetes Registry (DR) was 2.9 and 2.5 years for the individual and group therapy respectively ($P = 0.542$).

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http://dx.doi.org/10.1016/j.pcd.2014.07.005

Conclusion: Both interventions were equally effective in achieving the desired outcomes and time until entry to the DR. For large health organizations with a high number of pre-diabetes patients and scarce resources, group therapy, where 12 people are reached out by one team member are preferable and more costly effective, than a one on one therapy.

1. Background

Diabetes is a major health problem worldwide, and according to the World Health Organization's statistics, the incidence, prevalence, and mortality associated with the disease are consistently increasing [1]. Given its chronic nature, severe complications and long-term care requirements, diabetes has become an economic and social burden. Since diabetes is a heterogeneous and multifactorial disorder, it is suggested that prevention measures should be based upon the modification of several risk factors simultaneously; otherwise, there is insufficient potential for prevention. The well-known risk factors are moderate levels of blood glucose, hypertension, lack of physical activity, obesity, and poor nutrition in addition to medical and family history [2].

The American Diabetes Prevention Program (DPP) [3] is a successful program that demonstrated a reduction of 58% in the incidence of diabetes with lifestyle modifications and a 31% reduction with medication (Metformin) as compared to placebo. The lifestyle modifications included individual sessions for encouraging healthy diet habits, weight loss, and an increase in physical activity. Following the success of the American DPP, similar interventions were implemented in Australia [4], Europe and other parts of America, with an ethnic sensitive approach [5] and for wider population groups [6].

Maccabi Healthcare Services (MHS) is the second largest Health Maintenance Organization (HMO) in Israel, providing primary care to 1.9 million residents nationwide through five administrative and geographical regions. Physicians are employed in solo practices, and beneficiaries have free choice in regard to their own care-givers. The turnover between HMOs is relatively small, and beneficiaries tend to stay with their providers for a long period of time [7]. Thus, MHS stresses health promotion and invests significant resources in preventive care.

Among MHS beneficiaries, in 2005 82,000 (4.5%) were diabetic patients and recorded as such in the Diabetes Registry (DR), and 186,000 (9.7%) were considered as pre-diabetic according to their levels of fasting glucose (95–125 mg%). The Sharon region was selected for the intervention with relatively high number of pre diabetes patients – 35,000 (9%). MHS' intervention was based on the core principles of the American DPP, with the goal of reducing weight, blood glucose, LDL cholesterol, and HbA1 C measures and increasing HDL by modifications in diet, mainly into Mediterranean Diet (MedDiet), and physical activity.

The advantages of MedDiet are well documented in the scientific literature [8,9]. It is characterized by (i) a high consumption of vegetables, legumes, fruits, and cereals; (ii) a regular but moderate wine intake; (iii) moderate consumption of fish; (iv) low consumption of meat; and (v) low-to-moderate intake of low fat dairy products and (vi) nuts. Besides being a dietary pattern, the MedDiet is associated with a specific lifestyle with a moderate-to-high level of physical activity and the daily, high consumption of water [10].

Strategies to modify lifestyle behavior, in order to reduce the risk for developing chronic disease have been presented by previous studies over the years. They range from personal medical advice and check up [11]; individual diet consulting; circuit type resistance training sessions and advice on increasing physical activity to reduce weight [12]; commercial weight loss programs [13]; self-weighing and self-management of diet [14] and group therapies to encourage healthy diet and moderate-intensity physical activity [15]. However there is insufficient agreement which strategy is the most effective and the most cost benefit. Our hypothesis was that both individual and group therapy could be equally effective in preventing or delaying the development of type 2 diabetes. For health organizations, in periods of scarce resources, it is crucial to identify the ultimate intervention strategies to outreach large population groups with less investment of resources, not on the expense of achieving the goal of reducing risk factors.

Therefore, *the objective* of this study was to evaluate the effectiveness of the two types of MHS' DPP, in reducing risk factors and in preventing or delaying the development of type 2 diabetes.

2. Methods

2.1. *Setting*

The intervention was implemented in the central (Sharon) region of the country, where primary care is delivered to 380,000 beneficiaries.

2.2. *Study population*

Between the years 2005 and 2006, the MHS physicians (180) in the Sharon region were invited to a series of lectures to present the intervention program on enhancing healthy diet and physical activity habits. Eighty-five of them agreed to participate and were randomly assigned into two groups: (1) those who would refer/recruit pre-diabetes adult patients (40–65 years of age) for individual therapy and (2) those who would refer/recruit pre-diabetes adult patients for group therapy (Graph 1). Patients who participated at least in 80% of the intervention activities were included in the analysis.