Prevention of type 2 diabetes: the Finnish experience

*S Härmä-Rodriquez**

Summary

Prevention is nowadays an acknowledged part of health care. Type 2 diabetes is a costly disease with severe complications and its prevalence is increasing on a global scale. Several studies show that type 2 diabetes can be prevented and changes in lifestyle are effective.

Finland was the first country in the world that started a national prevention programme. The implementation of the programme is called FIN-D2D Project and it started 2003. The first part of it will be finished by the end of the year 2007.

FIN-D2D Project was first started in five hospital districts and the population in those districts is 1.5 million inhabitants. The Prevention Project influences health through three strategies: a population strategy, a high risk strategy and by early diagnosis and management. The main focus of the programme is on high risk strategy and screening. To prevent type 2 diabetes it is essential to find those people at high risk as soon as possible and to provide information and initiate appropriate interventions.

The new challenges for health care professionals working in the prevention project have been careful planning and co-operation with community sector and decision-makers. Group education has become an important part of education.

The effectiveness, cost-effectiveness and feasibility of the programme have been estimated and the evaluation will be published during the year 2008. If the results are positive the aim is to make prevention of type 2 diabetes a permanent part of primary and occupational health care practises.

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Key words

Prevention; population strategy; high risk strategy; screening; early diagnosis; interventions; evaluation

Introduction

Prevention has become a part of health policy and an acknowledged and planned aspect of treatment for some chronic diseases.

In Finland (population 5.2 million) approximately 200 000 people have diabetes, including 160 000 people with type 2 diabetes. In addition, at least 150 000 Finns are estimated to have type 2 diabetes without knowing it. Type 2 diabetes is a costly disease that threatens our welfare. The annual cost of caring for people with diabetes exceeds 11% of all Finnish health care costs.[1]

Several studies show that type 2 diabetes can be prevented by lifestyle changes, which are twice as effective as drug therapy for improving glucose tolerance.[2,3] However, the results of lifestyle improvements may not be seen immediately. Diabetes prevention takes years – maybe even decades – but by starting to improve the lifestyles of today's children, future generations may have healthier lives.

In Finland, the Development Programme for the Prevention and Care of Diabetes (DEHKO), which began in 2000, included elements of type 2 diabetes prevention.[4] *A prevention programme for type 2 diabetes 2003* which began in Finland in 2003, running until 2010, was the world's first national-level diabetes prevention programme. Encouraging results from the Diabetes Prevention Study (DPS)[2] in Finland and the Diabetes Prevention Programme (DPP)[3] in the USA support the concept of large-scale prevention programmes. Therefore implementation of this prevention programme called the *Programme for the Prevention of Type 2 Diabetes 2003–2010 and Implementation of the programme is called FIN-D2D Project (2003-2007),* started in five Finnish hospital districts (Figure 1), covering a population of 1.5 million. Today the model of FIN-D2D has been adapted to suit many other national disease prevention programmes.[5,6]

Preparation

The programme has been co-ordinated by the Finnish Diabetes Association (FDA) since its inception, although the Finnish Heart Association (FHA) and other national bodies have participated in different aspects of implementation, particularly at a population strategy level. Financing the programme has been critically important, of course, and in addition receiving funding from the FDA and FHA, other financing partners of FIN-D2D are the Ministry of Social and Health Affairs, Slot Machine Association, National Public Health Institute, the five hospital districts participating FIN-D2D and the pharmaceutical industry.

Key people, a national co-ordinator and five regional co-ordinators, were appointed to build the organisation.

Authors

S Härmä-Rodriquez, Diabetes Specialist Nurse, MSc

***Correspondence to :**
S Härmä-Rodriquez, The Finnish Diabetes Association/ Diabetes Centre, Kirjoniementie 15, 33680 Tampere Finland
e-mail: rodriquez@kolumbus.fi

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Approximately 2080 contributors are participating in the prevention project, and the national co-ordinator is also supported by an Advisory Board and Regional Expert Committees. FIN-D2D is mainly implemented at primary care level; in particular, public health nurses and occupational health nurses conduct the screening visits and interventions, therefore their co-operation in the programme is important. Various materials have been developed to support the programme's initiatives, for use by these occupational and primary health care professionals.

The FIN-D2D project also aims to produce data that will enhance the wider implementation of the prevention programme across Finland. If results are positive, the prevention of type 2 diabetes and other public health care problems will be established as permanent components of primary and occupational health care practice. The National Public Health Institute will estimate the effectiveness, cost-effectiveness and feasibility of the prevention programme across Finland, and an external expert group will assess the practical implementation of the project.

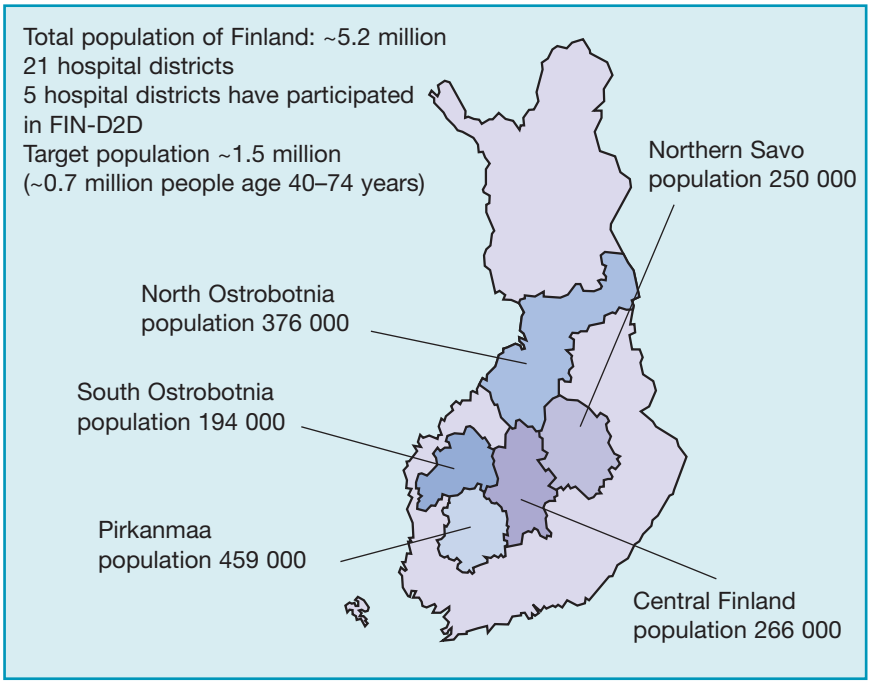

Figure 1. FIN-D2D prevention programme: participating hospital districts

Three approaches to type 2 diabetes prevention

The prevention programme influences public health through three strategies: population; identification of those at high risk; and early diagnosis and management.

Population strategy

The population strategy aims to promote health across an entire society by influencing the food industry and customers' lifestyle choices, encompassing everything from choosing healthier food products to providing people with more opportunities to exercise.

The strategy aims to encourage people to increase daily levels of physical activity by walking and biking. Other bodies, such as schools and day-care facilities, co-operate with health care providers, and common recommendations regarding food and snacks have been made. Project workers have also arranged large health-fair tours, where the healthy lifestyle message is linked to theatre, music and other arts and entertainment activities. In addition, there is a governmental duty to provide safer roads, suitable for riders and walkers.

The media is also an important aspect of the population strategy. Public awareness campaigns on type 2 diabetes prevention were organised by the Finnish Diabetes Association in 2001 and 2004. Information about obesity and the benefits of exercise and healthy eating are reported in newspapers and on television and radio each week, to familiarise everyone with the issues that they raise.

High-risk strategy

FIN-D2D focuses largely on a high-risk strategy, the challenge of which is to reach all of the risk groups. The Finnish Diabetes Risk Score (FINDRISC) test, which is available online, is the main tool used in the project for screening people at high risk.[7] This test, which was developed at the Finnish National Public Institute by Jaakko Tuomilehto and Jaana Lindström,[8] includes several core questions. People complete the risk test during routine primary care and occupational health consultations, although it can also be undertaken in pharmacies or online.[7] The risk test form contains information on how to complete it, the meaning of the scoring system, and advice on what to do if one scores more than 15 points (Figure 2).

Early diagnosis and management

Early diagnosis aims to identify people with type 2 diabetes as soon as possible and give them efficient treatment, without delay. Prevention of severe complications is also part of such a strategy.

Interventions and the nurse's role in prevention

Diabetes specialist nurses are keen to educate, provide information

and support their local teams and colleagues in primary and occupational health care. They also participate in planning population strategies and care paths in municipalities.

In prevention, post-screening interventions are essential so that people receive accurate information when they are found to be at high risk of developing type 2 diabetes, or already have IGT or IFG. Patient education, care paths and interventions have been planned carefully from the beginning (Figure 3). The number of people at high risk of type 2 diabetes – and people newly diagnosed with this illness – was expected to be high, and to grow, after initiating systematic screening.

Initial consultations

All individuals at high risk of developing type 2 diabetes are referred for intervention at their first visit to the nurse. Individuals complete a simple questionnaire that provides information about family illnesses, personal lifestyle, diet, exercise habits and general well being. This basic information is documented and is used to help plan intervention measures. During the first nursing consultation, these aspects are discussed and basic measurements (e.g. height and weight) are taken. The nurse also discusses the definition of prevention of type 2 diabetes, together with possible interventions. People at high risk of type 2 diabetes are also referred for a two hour oral glucose tolerance test (OGTT) and a blood lipid test, unless these have been performed within the previous 12 months. The sensitivity of the fasting blood glucose test is inadequate for diagnosis of impaired glucose metabolism, therefore OGTT is undertaken in everyone at high risk of type 2 diabetes.[8]

At the second visit laboratory results are checked and the continuation of the process is discussed. If laboratory results support a diagnosis of type 2 diabetes or hyperlipidaemia, the individual is referred to a doctor. During the second visit the nurse discusses the motivation to take part in interventions and explains the importance of these measures. The doctor often writes a Physical Activity Prescription, which is used as a tool to increase the individual's exercise level. Targets, commitments and plans are recorded, and information is entered into a data collection

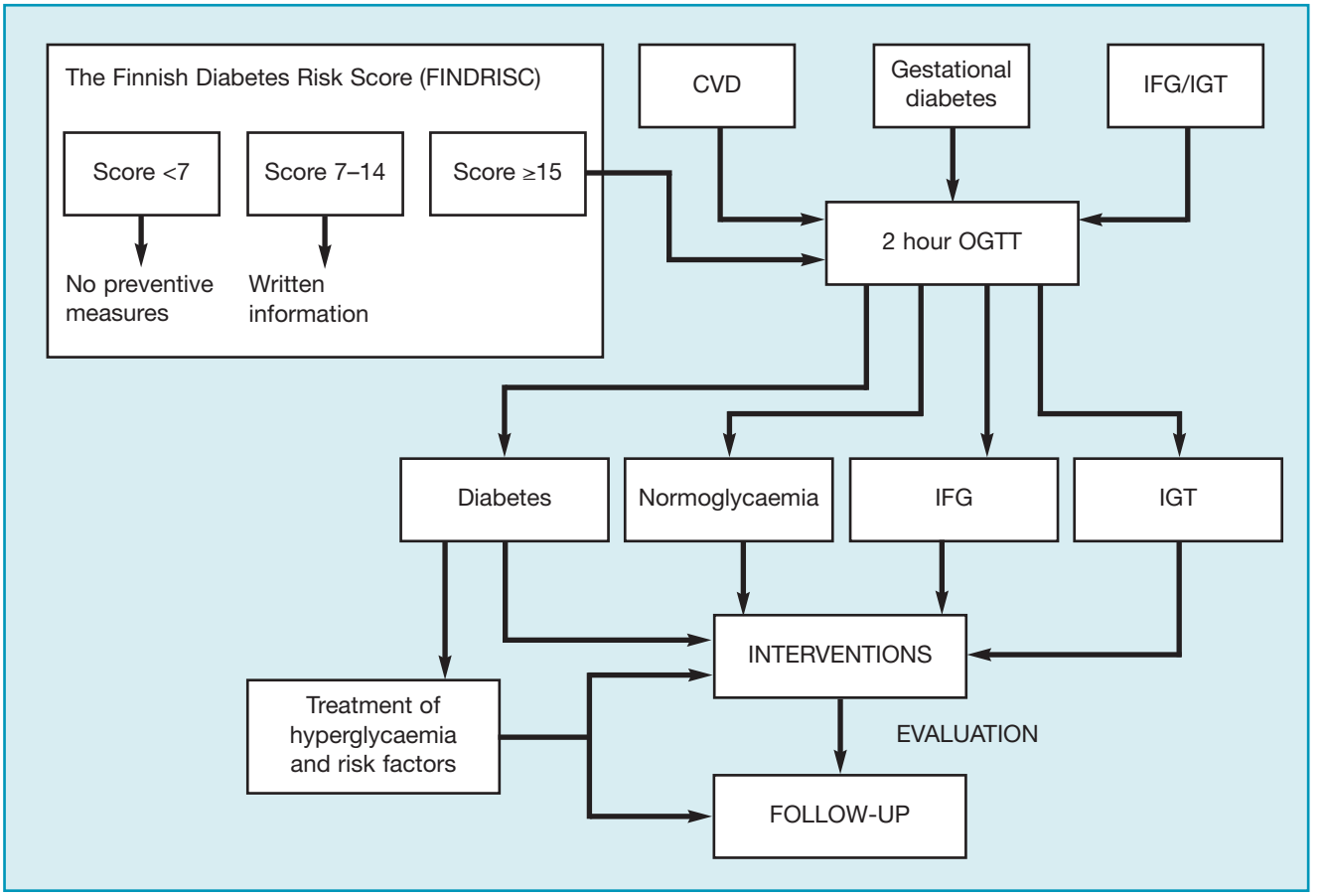

Figure 2. Screening, diagnostics and interventions in FIN-D2D CVD, cardiovascular disease; IFG, impaired fasting glucose; IGT, impaired glucose tolerance; OGTT, oral glucose tolerance test

system. High-risk persons receive annual follow-up appointments; those with newly diagnosed type 2 diabetes receive more regular consultations, initially.

Group education

From the beginning of FIN-D2D group education was used as a main intervention tool. Different group sessions are arranged for people newly diagnosed with type 2 diabetes and others high risk of developing this illness. Group interventions focus on lifestyle modifications. Nutritionists, doctors, physiotherapists, psychologists, diabetes specialist nurses, public health nurses and occupational health nurses work together to plan the group-intervention programme. Each session usually lasts 1.5–2 hours, with most group interventions being divided into 4–6 sessions. The groups meet either weekly or every other week.

Each participant creates his own plan for lifestyle modification and it is evaluated in each session. People assess their present situation and goals they intend to realise. The group leader fills FIN-D2D intervention visit form in every intervention visit.

Group sessions usually consist of the following topics:

1. Medical aspects:
   - Metabolic syndrome
   - Type 2 diabetes
   - Cardiovascular disease
   - Importance of healthy living
   - Medication
2. Dietary aspects:
   - Weight control
   - Healthy diet
   - Timing of meals
   - Alcohol, high pressure situations
3. Psychological aspects:
   - Lifestyle changes – pros and cons
   - Attitudes
   - Stress
4. Physiological aspects:
   - The importance of exercise
   - Personal exercise habits and potentials

Participants receive information and discuss nutrition, daily physical exercise, weight management, smoking and other lifestyle elements that are important to prevent diabetes.

New education needs

A new weight-management instructor training programme has been established and, to date, over 700 instructors have been trained in primary and occupational health care.[9,10] To evaluate and follow the situation and lifestyle modification process, the Stages of Change Model, which is the latter part of the Transtheoretical Model of Prochaska and Di Clemente,[11,12] is used in the prevention project. A mapping and follow-up form based on this model for the evaluation of lifestyle changes is often used, and follow-up is written: need for change, stage of readiness for change and goal setting and action are documented and discussed at each visit. Doctors also use a physical activity prescription, as previously mentioned. A support programme has also been established to help provide group education for new patients with type 2 diabetes.

Rewards and challenges for the future

The project plan was designed to last until 2007 but the need to continue the project is essential. By the end of 2007 it is estimated that 100 000 people will have been assessed for diabetes risk and 50 000 will have been referred for intervention. During 2008 the final report and conclusions will be published. The care paths and working methods were modified during the project's early years and are now working tools, used in primary and occupational health care.[12] Future planning for the prevention project is under way, and encouraging results from research regarding follow-up of the DPS intervention group show that lifestyle modification is worthwhile.[13] After a mean follow-up of 3.2 years, diabetes risk reduced by 58% in the intervention group compared with the control group.[2] During the three-year post-intervention follow-up period, the risk of diabetes remained 36% lower among the former intervention-group participants compared with former control-group participants.[13] Even after counselling was discontinued, the differences remained in lifestyle variables.[14]

Screening has identified more high-risk individuals and new cases of type 2 diabetes than expected. The FIN-D2D Survey 2004 shows that the total prevalence of type 2 diabetes is 16% in men and 11% in women.[13] The prevalence of abnormal glucose regulation was 42% in men and 33% in women.[13] The number of individuals participating in interventions remains lower than expected and it is particularly difficult to persuade men to participate: more communication and motivational skills are needed. Not all health care professionals commit to the project, therefore greater cooperation, support and regular feedback is also needed in clinical settings.

At present it is impossible to assess project effectiveness and management, due to insufficient data being available, although data collection problems should be resolved in future. Currently, information is collected on paper, using optical readers, therefore it takes time for results to become available. The evaluation criteria has been approved by the projects Steering Comittee. The primary aim of project evaluation is to determine the effectiveness of lifestyle counselling and risk reduction of developing type 2 diabetes among high risk individuals.

A valuable recognition for hard work and commitment was the WHO Counteracting Award 2006, which was presented to the DEHKO and FIN-D2D Project, for activities that

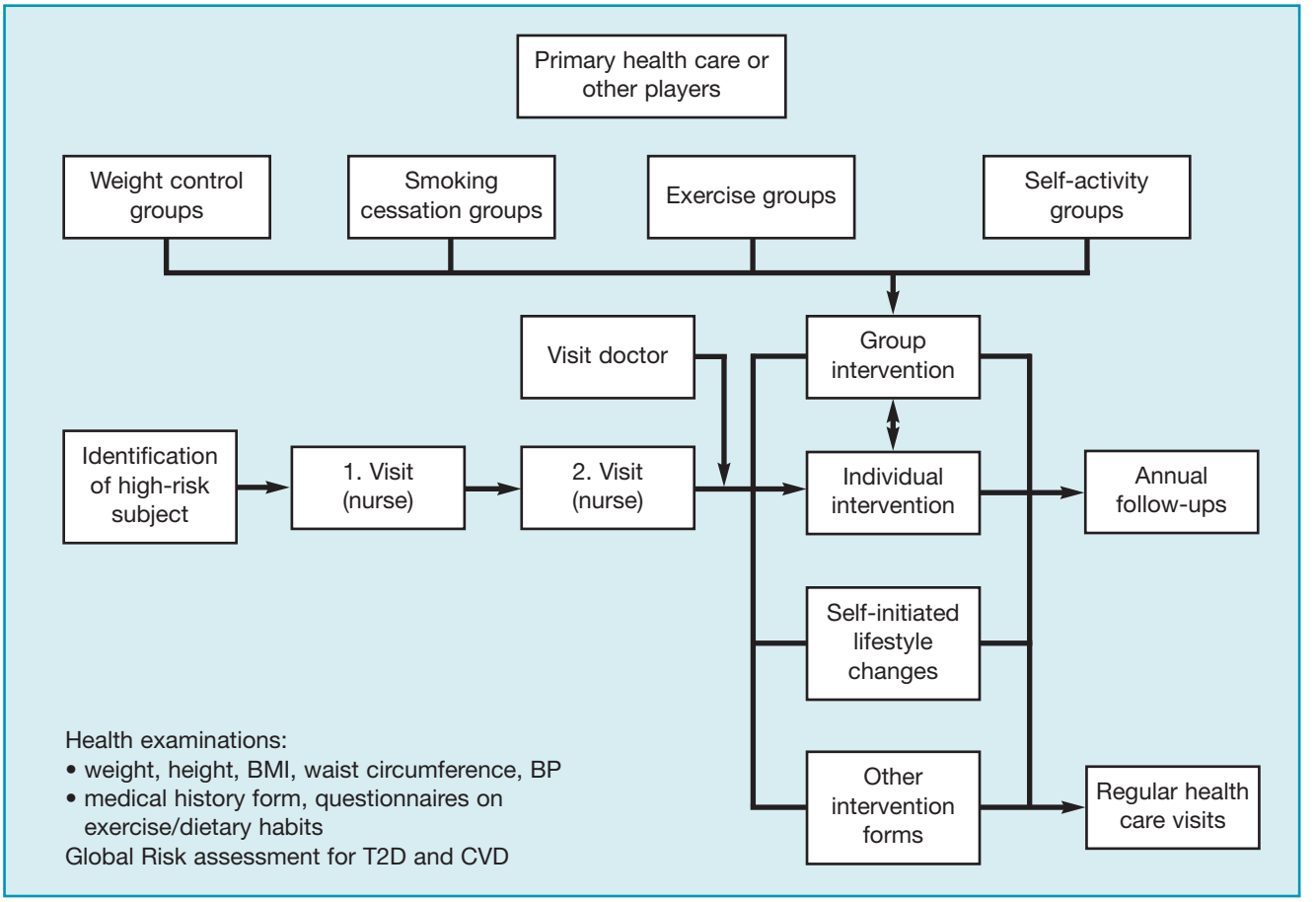

Figure 3. FIN-D2D Interventions BMI, body mass index; BP, blood pressure; T2D, type 2 diabetes; CVD, cardiovascular disease

support the health sector in addressing obesity in high-risk groups across the WHO European Region.

Conflict of interest statement:
None

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