Contents available at Sciverse ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

Design and preliminary results of a metropolitan lifestyle intervention program for people with metabolic syndrome in South Korea

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ARTICLE INFO

Article history:
Received 30 January 2013
Received in revised form
15 May 2013
Accepted 6 June 2013
Available online 11 July 2013

Keywords:
Counseling
Lifestyle
Metabolic syndrome
Non-communicable disease
Prevention

ABSTRACT

Introduction: The Seoul Metabolic Syndrome Management (SMESY) project, a metropolitan lifestyle intervention program aimed at decreasing the risk of metabolic syndrome to the residents of the city, has recently been implemented in 2011.

Methods: Our target population consisted of residents of Seoul who were 30–64 years old. Subjects visiting a Public Health Center were screened for five risk factors for metabolic syndrome and then divided into three groups according to the number of the risk factors: active counseling, for having more than three risk factors; motivational guide, for having one or two; and information support for having none. Members of the active counseling group, the main target of the project, were provided with monthly in-person counseling on health-related lifestyle choices, as well as a follow-up examination every 3 months during the 12-month program.

Results: In the active counseling group, subjects showed statistically significant improvements in all five risk factors and the average number of retained risk factors decreased from 3.5 to 2.7. However, the percentage of active counseling group members who attended at least 3 out of the 4 sessions provided was only 11.3%. As for the motivational guide group and the information support group, clinically significant improvements were not observed and the percentage of members who attended all sessions were 10.4% and 11.8%, respectively.

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0168-8227/$ – see front matter
http://dx.doi.org/10.1016/j.diabres.2013.06.006

Conclusions: Increased public participation for the ongoing project is expected to lead to great positive changes in the health of people with metabolic syndrome.

1. Introduction

Non-communicable disease (NCD) is becoming a major public health problem in both developed and developing countries due to the decrease in communicable diseases and increase in life expectancy [1,2]. Globally, NCD is responsible for half of all mortality and disease burden, with cardiovascular disease (CVD) and diabetes mellitus (DM) accounting for half of all NCD mortalities [3]. Although high blood pressure, high blood glucose, and lipid abnormalities are the immediate causes of NCD, the underlying causes stem from unhealthy lifestyles; 80% of deaths caused by NCD are preventable [4]. Therefore, the best strategy for addressing NCD is prevention through lifestyle modification.

There are effective national or regional prevention strategies for NCD in some developed countries, such as the North Karelia project in Finland (established to reduce coronary heart disease), and diabetes prevention programs exist in multiple countries around the world [5–8]. As a countermeasure to the rapid increases in the disease burden and medical costs of chronic disease, Japan launched a nationwide project in 2008 that implements focused health guidance and targets metabolic syndrome patients [9]. Japan's project, unlike other existing NCD prevention programs, strategically targets metabolic syndrome, which is a pre-morbid state of NCD.

In Korea, CVD and DM create the greatest burden of disease, and the socioeconomic costs from these conditions are steadily rising [10–12]. Considering the substantial adverse effects of these conditions, a national NCD prevention program is urgently needed in Korea. However, the country's healthcare system is largely privatized and centered on treatment, and such a wide-scale prevention strategy has never been implemented. Public Health Centers acting as local public health agencies have been in charge of such preventive services, but there are no standardized programs.

Amidst the urgent need for an effective and practical NCD prevention program in Korea, the Seoul Metabolic Syndrome Management (SMESY) project, a lifestyle intervention program aimed at decreasing the risk of metabolic syndrome, was officially implemented across Seoul in March 2011, a year after launching the demonstrative project. This paper discusses the design and preliminary results of this project.

1.1. *Theoretical framework for the project*

The basic theoretical background of the SMESY project is based on metabolic syndrome as a high-risk condition for CVD and DM. Metabolic syndrome comprises a collection of cardiometabolic risk factors: abdominal obesity, high blood pressure, hyperglycemia, and lipid abnormalities [13]. According to the Framingham Heart Study, people with metabolic syndrome are two times more likely to have CHD and five times more likely to have type 2 diabetes than people without metabolic syndrome [14]. Numerous studies have shown that metabolic syndrome is an important predictor of CVD and DM mortality [15]. The World Health Organization (WHO) states that metabolic syndrome should not be used as a tool for clinical diagnosis of a disease but should be considered a pre-morbid state of CVD and diabetes. The WHO recommends a population-based program that utilizes the concept of metabolic syndrome as a cost-effective CVD reduction strategy [16]. In other words, metabolic syndrome is being recognized as an effective tool for identifying subjects who are at a high-risk of developing CVD and DM.

The first management approach for metabolic syndrome is not drug treatment, but lifestyle modification, that is to say, making healthier choices in diet, exercise, and smoking [17]. Several randomized-controlled trials have shown that direct lifestyle interventions have a significant effect on improving health. Diet and exercise programs significantly decrease biochemical indicators of metabolic syndrome, weight, and waist circumference [18,19]. Similar results have been reported in lifestyle interventions for people with metabolic syndrome [20,21]. Unsurprisingly, the more closely a patient follows an intervention program, the greater the reduction in symptoms of metabolic syndrome [22].

Japan's project provides evidence of the effectiveness of a population-based program for people with metabolic syndrome. About 400,000 metabolic syndrome patients participated in a 6-month consultation intervention program aimed at improving lifestyles and significant improvements in all risk factors of metabolic syndrome were observed.

Based on the theoretical framework regarding the usefulness of the metabolic syndrome concept and the effectiveness of lifestyle intervention mentioned above, the SMESY project planned a counseling intervention program to improve the lifestyles of people with metabolic syndrome.

2. Materials and methods

2.1. *Subject eligibility and recruitment*

The target population consisted of residents of Seoul aged 30–64 years. The prevalence of metabolic syndrome under the age of 30 is low, and the effectiveness of consultation intervention for people over 65 is reportedly lower. The project was promoted through various media outlets and directed interested citizens to the nearest Public Health Center which is public health agency uniformly distributed across Seoul city.