Asian Nursing Research 8 (2014) 82–89

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

A Web-based Health Promotion Program for Patients with Metabolic Syndrome

Ji Soon Kang, PhD, RN,[1] Hyun Sook Kang, PhD, RN,[2,*] Younhee Jeong, PhD, RN[3]

[1] Department of Nursing, Kyungbok University, Pocheon, Kyunggi-do, Republic of Korea
[2] College of Nursing Science, Kyung Hee University, Seoul, Republic of Korea
[3] College of Nursing Science and East-West Nursing Institute, Kyung Hee University, Seoul, Republic of Korea

ARTICLE INFO

Article history:
Received 31 October 2012
Received in revised form
6 August 2013
Accepted 12 December 2013

Keywords:
health promotion
lifestyle
metabolic syndrome

SUMMARY

Purpose: The population of metabolic syndrome is increasing in Korea. The prevalence is related to lifestyle, such as lack of physical activity and irregular diet. Most patients with metabolic syndrome know that lifestyle intervention is important to managing the condition. However, they do not always follow the intervention for various reasons, including lack of knowledge on how to change their lifestyle and lack of accessibility to that knowledge. The purpose of this study was to test the web-based health promotion program we developed.
Methods: Fifty-six adult workers from eight areas of business were recruited. They all had a confirmed metabolic syndrome diagnosis after being registered at a university hospital for annual health checkups. Twenty-nine workers were assigned to the experimental group, and the others were assigned to the control group. The web-based program was applied to the experimental group as an intervention for 8 weeks. Waist circumference, fasting blood glucose, triglyceride, high-density lipoprotein cholesterol, and blood pressure were measured before and after the program. Data were analyzed using chi-square test, Fisher's exact test, and t test.
Results: There were statistically significant differences between the two groups in waist circumference and high-density lipoprotein cholesterol ($t = -4.43$, $p < .001$; $t = 2.22$, $p = .031$, respectively). Of the 29 participants, 13 (44.83%) in the intervention group had less than two indices for metabolic syndrome.
Conclusions: This study suggests that a web-based program is useful for patients with metabolic syndrome to improve physiologic parameters related to metabolic syndrome. The web-based program may be easily applicable to community as well as clinical setting.

Introduction

Metabolic syndrome has been also called Syndrome X, dysmetabolic syndrome, insulin resistance syndrome, and cardiometabolic syndrome (Alberti & Zimmet, 1998; Chan, Tong, & Critchley, 2002; Grundy, Brewer, Cleeman, Smith, & Lenfant, 2004; Reaven, 1988). It is a group of metabolic abnormalities that can increase the risks of cardiovascular diseases and diabetes mellitus (Alberti et al., 2009; Cameron, Shaw, & Zimmet, 2004). Cardiovascular diseases and diabetes are common chronic diseases that cause increases in medical costs and decreases in the quality of life for the patients, their families, and the community as a whole (Whittemore, 2000). To reduce risks of those diseases, it is critical to prevent and manage metabolic syndrome.

The etiology of metabolic syndrome includes genetic and environmental factors. Environmental factors, such as lack of exercise, as well as dietary habits, such as irregular diet and eating junk food, are major environmental and modifiable risks for metabolic syndrome, while genetic factors are nonmodifiable risks (Bianchi et al., 2008). That is the reason that lifestyle changes, including physical activity and healthy dietary habits, are essential parts in the prevention and management of metabolic syndrome (Alberti et al., 2009; Beşer, Bahar, & Büyükkaya, 2007; Jou et al., 2010). The theories on changes in health behavior emphasize the importance of health education and repeated education to maintain the behavior change (Glanz, Rimer, & Viswanath, 2008). Therefore, it is also very important to provide information for the patients with metabolic syndrome on a regular basis to change and maintain lifestyle. However, it is hard for working adults to attend the program at a

* Correspondence to: Hyun Sook Kang, PhD, RN, Kyung Hee University, 1 Hoegi-dong, Dongdaemun-gu, Seoul 130-701, Republic of Korea.
E-mail address: hyunsuk@khu.ac.kr

http://dx.doi.org/10.1016/j.anr.2014.03.002

fixed time and place even though many employees have metabolic syndrome (Schultz & Edington, 2009). Educational programs that take into consideration these nonflexible characteristics of workers in terms of time and place are needed.

Programs using a computer and the internet have become more popular worldwide because people can access them from home and/or their workplace easily. They are also more convenient because there is no time and place restriction for the participants in those programs (Bond et al., 2007; Colkesen et al., 2011; Cook, Billings, Hersch, Back, & Hendrickson, 2007; Kim & Han, 2004; Kypri & McAnally, 2005). There are some studies using web-based health promotion programs on cardiovascular diseases, obesity, and hypertension (Alm-Roijer, Stagmo, Uden, & Erhardt, 2004; Sniehotta, Schwarzer, Scholz, & Schüz, 2005; Watson et al., 2012), but there is no web-based intervention studies published covering all indices of metabolic syndrome together. In addition, there are some recent websites that provide information on metabolic syndrome, but they mostly provide it in written form. To increase the outcome of education, such as knowledge of metabolic syndrome and intervention options, as well as behavioral and physiological changes, we developed a web-based health promotion program. It included audio-visual instruction technology with help of experts in medicine, nursing, and informational technology. The program is based on the results of an educational needs assessment questionnaire given to 34 patients with metabolic syndrome in a pilot study (unpublished). To change lifestyle, compliance as well as information is important. Enhancements in compliance improve indices of metabolic syndrome (Camhi, Stefanick, Katzmarzyk, & Young, 2010; Jou et al., 2010).

The purpose of this study is to test the effectiveness (changes in indices of metabolic syndrome diagnosis and lifestyle compliance) of the web-based program on patients with metabolic syndrome.

Methods

Study design

A quasi-experimental pretest–post-test design with a control group was used for this study.

Setting and sample

The sample size was 26 for each group, for a total of 52 participants, calculated based on power = .8, effect size = 0.8, and alpha = .05. According to Oh et al. (2010)'s study which is similar to our study, an effect size r of −0.93 is categorized as a "large" effect size. Because we used t test, we needed effect size d instead of r. Therefore, we used 0.8 for effect size to calculate the sample size because 0.8 is categorized to "large" effect size for d. Taking dropout rate into consideration, we recruited 63 participants from eight places of business and collected data from 56 of them (Figure 1). The participants were assigned to either the intervention or control group based on their place of business to decrease contamination between the groups, although the places of business chosen for the intervention were randomly assigned. Sixty-three adult workers from eight places of business were recruited; they all had a confirmed metabolic syndrome diagnosis after being registered at a university hospital for annual health checkups. Eligibility criteria included adult men and women who had more than three indices

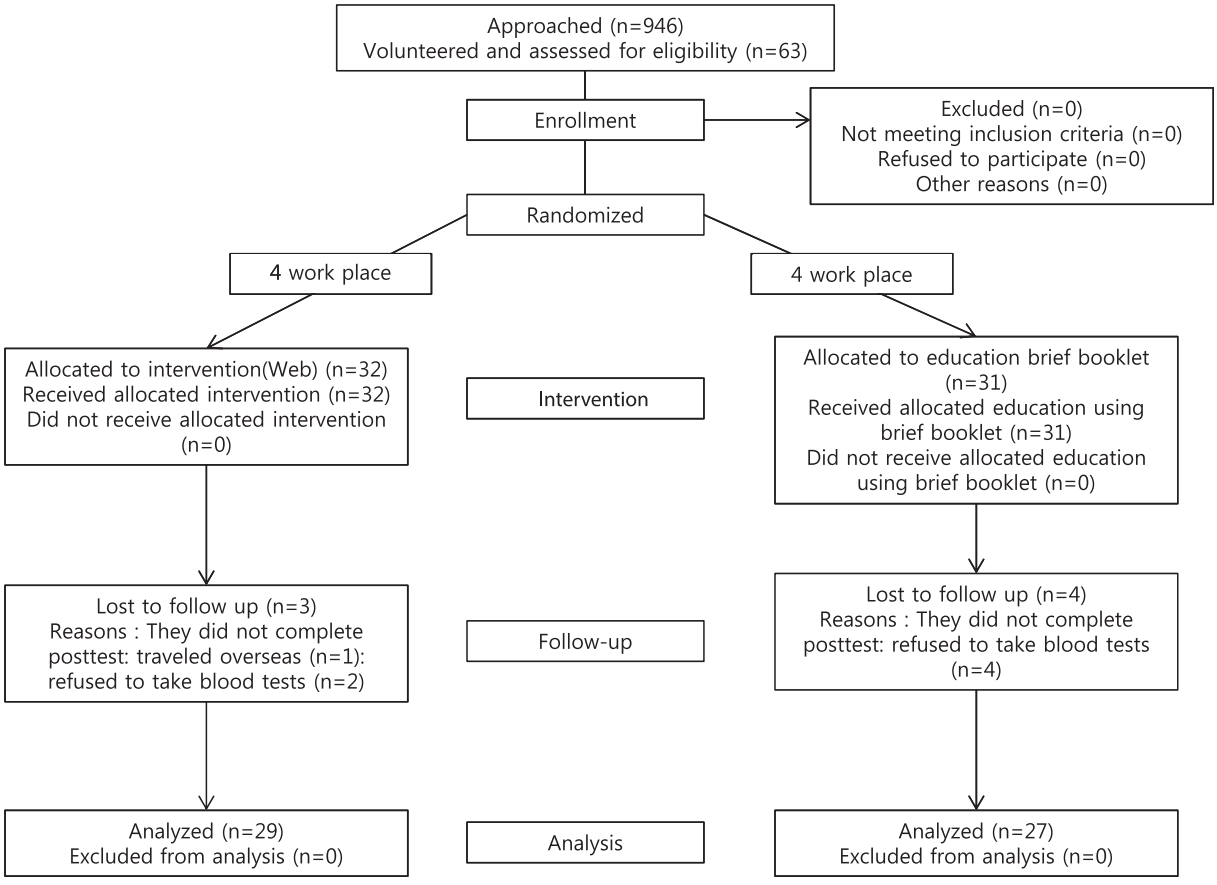

Figure 1. Flow chart for recruitment.