Asian Nursing Research 9 (2015) 349–355

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

Association of Family Composition and Metabolic Syndrome in Korean Adults Aged over 45 Years Old

Young-Ju Kim, RN, ACNP, PhD *

College of Nursing, Sungshin Women's University, Seoul, South Korea

ARTICLE INFO

Article history:
Received 20 January 2015
Received in revised form
23 September 2015
Accepted 23 October 2015

Key words:
living arrangements
metabolic syndrome X
women

SUMMARY

Purpose: This study investigated the relationship between family composition and the prevalence of metabolic syndrome by gender in Korean adults aged 45 years and older.
Methods: The sample consisted of 11,291 participants in the Korea National Health and Nutrition Examination Survey from 2010 to 2012. We used complex sample analyses, including strata, cluster, and sample weighting, to allow generalization to the Korean population. Complex samples crosstabs and chi-square tests were conducted to compare the percentage of sociodemographic characteristics to the prevalence of metabolic syndrome and its components by gender and family composition. Next, a complex sample logistic regression was performed to examine the association between family composition and the prevalence of metabolic syndrome by gender.
Results: The percentage of adults living alone was 5.6% for men and 13.9% for women. Slightly more women (14.0%) than men (10.1%) reported living with three generations. The percentage of metabolic syndrome in Korean adults aged 45 years and older was 53.2% for men and 35.7% for women. For women, we found that living with one or three generations was significantly associated with a higher risk of metabolic syndrome, blood pressure, and triglyceride abnormality after adjusting for age, education, household income, smoking, physical activity, and body mass index, when compared to living alone. No significant relationships were found for men.
Conclusions: A national strategy, tailored on gender and family composition, needs to be developed in order to prevent the increase of metabolic syndrome in Korean women over middle age.

Introduction

Metabolic syndrome (MetS) is a global public health problem that increases the risk of death caused by cardiovascular disease and diabetes. In 2012, cardiovascular disease, cerebrovascular disease, and diabetes were the second, third, and forth leading causes of death, respectively, in Korean adults [1]. Globally, the prevalence of MetS ranges from 8.0% to 24.0% in men and from 7.0% to 46.0% in women [2]. However, the prevalence of MetS in Koreans aged 30 years and older inclines toward the higher end of the range (31.9% for men, 25.6% for women, and 28.8% combined) [3].

Various sociodemographic factors, such as older age, low household income, low educational attainment, unemployment, family history, and ethnicity have been associated with developing MetS [4–9]. Lifestyle behaviors, such as smoking, heavy alcohol consumption, physical inactivity, and a high carbohydrate intake [5,6,10–12] in addition to a higher body mass index, predominant central obesity, insulin resistance, and postmenopausal status [5,13,14] have also been associated with an increased risk of developing MetS.

To our knowledge, there are no studies investigating the role of family composition regarding the prevalence of MetS despite evidence suggesting that living arrangement affects health, mortality, and dietary quality [15–18]. For example, studies have shown that adults, middle-aged and older, who either lived alone or with someone other than a spouse tended to have poorer dietary quality [18], and an increased mortality risk [17] than adults living with a spouse. Furthermore, Umberson [19] reported that mortality was lower for people who were married and had children, especially young children. Living with other family members has been shown to promote compliance with group norms, encourage beneficial health practices, and reduce stress through emotional reassurance [16].

* Correspondence to: Young-Ju Kim, RN, ACNP, PhD, College of Nursing, Sungshin Women's University, 147 Mia-dong, Kangbuk-gu, Seoul, 142-732, South Korea.
E-mail address: yjkim727@sungshin.ac.kr

http://dx.doi.org/10.1016/j.anr.2015.10.006

However, little attention has been given to women who have multiple roles and responsibilities for family caregiving. Women who not only serve as the primary caregiver to their parent or parent-in-law, but simultaneously are married and have children at home are often referred to as women in the middle [20]. The roles these women occupy compete for their time and energy and that the responsibilities of their multiple roles make these women especially vulnerable to stress. An accumulation of stress across multiple roles was related to poorer well-being [20]. On the contrary, multiple roles may provide individuals with role privileges and personal enrichment [21]. Of key concern are the stressors such men and women encounter in these multiple roles and how these positive and negative experiences are related to their health status.

It is widely recognized that gender shapes life experiences, and that even in similar roles men and women may encounter different patterns of opportunities and constraints [21]. Because changes in living arrangements are more prevalent for women (because women are more likely to be widowed as they age) than men [15], it is important to consider gender differences when examining the impact of living arrangements on health. Previous studies [5,13,22,23] demonstrated that Korean men tend to have a higher prevalence of MetS than Korean women do from young age ($\geq$ 20 years) to middle age ($<$ 50 years). The peak age of MetS in Korean men was 40 years old through 49 years old, and the prevalence decreased with aging [22]. However, Korean women have a higher prevalence than Korean men do above the age of 50 years [5,13,22,23].

The purpose of this study was to examine whether family composition was associated with the risk of MetS in Korean adults aged 45 years and older according to gender. The findings from this study would provide critical information with regard to how role experiences according to various family composition contribute to Korean adults' health in terms of MetS and its components.

Methods

Study design

A secondary analysis of existing cross-sectional data was used to investigate the association between family composition and the prevalence of MetS in Korean adults aged 45 years and older.

Data source

Data were derived from the Korea National Health and Nutrition Examination Survey (KNHANES) conducted by the Korea Centers for Disease Control and Prevention (KCDC) from 2010 to 2012. The KNHANES consists of three main questionnaires: the Health Interview Survey (HIS), the Nutrition Survey, and the Health Examination Survey. The HIS provides information on living arrangement, health status, and health-related behaviors as well as sociodemographic data. The Nutrition Survey provides daily food intake and the Health Examination Survey consists of data about height, weight, blood pressure, blood glucose, waist circumference, triglyceride levels, high-density lipoprotein cholesterol levels, body mass index (BMI), and past medical history.

Study sample

Data were collected from 25,534 participants who responded to the HIS questionnaire. The sample for this analysis, however, was restricted to 11,810 adults aged 45 and older. An additional 262 participants with a history of cancer and 257 participants with a white blood cell count $\leq$ 10,000 cells/μL were excluded from the sample. Thus, the final analytic sample consisted of 11,291 adults (4,843 men and 6,448 women).

Ethical considerations

The KNHANES VI-3 data sources are publicly available and participant information provided by the KCDC is nonidentifiable. Only de-identified data was used for this analysis. The data set was downloaded from the KCDC website (http://knhanes.cdc.go.kr) free of charge. The study was approved by the Institutional Review Boards of the Sungshin Women's University (sswuirb 2013-034).

Measures

Sociodemographic characteristics

The sociodemographic variables measured included age, marital status, education, household income, alcohol use, smoking, perceived level of stress, physical activity, and BMI. Marital status was collapsed into three categories: married, not married, and divorced/widowed. Level of education was collapsed into four categories: elementary school or lower, middle school, high school, and college/post-graduate. Monthly average household income was collapsed into four categories (as recommended by the KCDC): lower, middle-lower, middle-upper, and upper. The frequency of alcohol use was collapsed into three categories: less than once a week, twice or three times a week, and more than four times a week. Smoking status was collapsed into three categories: nonsmoker, ex-smoker, and current smoker. Perceived level of stress was assessed by one item “How much do you usually perceive stress?” and the original response was collected with four scales. However, it was dichotomized as low and high levels due to insufficient responses for both extreme scales. Physical activity was assessed by asking the number of days per week spent participating in moderate physical activity (defined as walking for more than 30 minutes a day). Responses were then collapsed into three categories: less than 1 day a week, 2–3 days a week, and more than 4 days a week.

Metabolic syndrome

Based on the revised National Cholesterol Education Program's Adult Treatment Panel III [24], MetS is defined as the presence of three or more of the following five criteria: (a) waist circumference $\geq$ 90 cm in men or $\geq$ 85 cm in women (using the Korean abdominal obesity criterion), (b) fasting blood glucose $\geq$ 100 mg/dL, (c) systolic blood pressure $\geq$ 130 mmHg or diastolic blood pressure $\geq$ 85 mmHg, (d) high-density lipoprotein cholesterol $<$ 40 mg/dL in men or $<$ 50 mg/dL in women, and (e) triglyceride $\geq$ 150 mg/dL. It should be noted that the same criteria for assessing cardiovascular risk via waist circumference in a Western population could not be used for a Korean population because Koreans have a lower waist circumference than most Western populations [25]. Therefore, this study used modified criteria for abdominal obesity recommended by the Korean Society for Obesity. In addition, participants who reported currently taking medications for hypertension, diabetes, or dyslipidemia were classified as having a MetS-related disease or abnormality.

Height, weight, waist circumference, and a blood sample were taken and analyzed using standardized techniques and calibrated equipment. Brachial systolic and diastolic blood pressure readings were taken from the seated position after 5 minutes of rest at 30-second intervals. The average of three readings was used. For lipid and glucose assays, a fasting blood sample was drawn from the participant's arm. Detailed descriptions of the anthropometric, venipuncture, and blood pressure measurement procedures can be found in the Guidelines for Use of KNHANES IV Raw Data and the Final Report of KNHANES IV sampling frame [26].