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Abstract

Background: General and central obesity are important risk factors for chronic diseases and health-related outcomes.

Aims: We determined the prevalence of obesity and related complications among individuals aged 40–70 years in Kherameh, southern Islamic Republic of Iran.

Methods: This cross-sectional study included 10 663 people aged 40–70 years who participated in the first phase of the Kherameh cohort study. Data were collected on demographic characteristics, history of chronic diseases, family history of diseases, and various clinical measures. We used multiple logistic regression analysis to establish the relationships between general and central obesity, and related complications.

Results: Of the 10 663 participants, 17.9% had general obesity and 73.5% had central obesity.

In people with general obesity, the odds of having the non-alcoholic fatty liver disease and cardiovascular disease were 3.10 times and 1.27 times higher than in individuals with normal weight, respectively. People with central obesity had higher odds of having other components of metabolic syndrome such as hypertension (OR: 2.87; 95% CI: 2.53–3.26), high triglyceride levels (OR: 1.71; 95% CI: 1.54–1.89), and low high-density lipoprotein cholesterol levels (OR: 1.53; 95% CI: 1.37–1.71) than those without central obesity.

Conclusions: The study showed a high prevalence of general and central obesity and health-related effects, and its association with several comorbidities. Given the level of obesity-related complications found, primary and secondary prevention interventions are needed. The results may help health policymakers establish effective interventions to control obesity and related complications.

Keywords: obesity, prevalence, risk factors, chronic disease, Islamic Republic of Iran.

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Introduction

The prevalence of obesity in different parts of the world

has shown a worryingly increasing trend (1). Most concerns about this disease are because of its associated complications (2). Thus, the increasing prevalence of overweight and obesity is an important public health problem worldwide (3). The global prevalence of obesity in adults is 10.8% in males and 14.9% in females (4). In Eastern Mediterranean countries, the prevalence of obesity and overweight has shown differing trends, ranging from 25.0% to 81.9% (5).

Body mass index (BMI) is a suitable measure of general obesity and elevated BMI is a risk factor for several causes of death, including ischaemic heart disease and stroke (6). Globally, 23% of cardiovascular diseases (CVDs) are associated with overweight and obesity, most of which occur in developing countries (7). Studies have shown that central obesity, with complications such as metabolic syndrome and coronary heart disease, are more closely linked with a person's BMI (8,9).

Non-alcoholic fatty liver disease is a chronic disorder that occurs as a result of the accumulation of fat in the liver (2). The most important risk factors associated with non-alcoholic fatty liver disease are central obesity, type 2 diabetes, dyslipidaemia and metabolic syndrome (10).

Metabolic syndrome is another complication associated with obesity and it significantly increases the risk of type 2 diabetes, stroke and hepatic steatosis (11). The International Diabetes Federation defines metabolic syndrome as having central obesity plus 2 of the other 4 components of metabolic syndrome, which are: elevated triglyceride levels or specific treatment for these fatty disorders; reduced high-density lipoprotein (HDL) cholesterol or specific treatment for these lipid disorders; high blood pressure or a previous diagnosis of hypertension; and high fasting plasma glucose levels or a previous diagnosis of type 2 diabetes (12).This definition is an effective diagnostic tool for research purposes and clinical practice. Physicians can use it to identify high-risk patients for health-related outcomes in any country (13).

Comprehensive and accurate information is lacking

on the prevalence of obesity and its associated complications in different regions of the Islamic Republic of Iran and among different age and sex groups (14). Therefore, this study was carried out to investigate the prevalence of general and central obesity and several related complications using baseline data from a population-based cohort study conducted in Kherameh City, southern Islamic Republic of Iran. We examined and controlled for several complications associated with general and central obesity, including many confounding variables. The components of metabolic syndrome were considered separately as complications, and the relationship of each with general and central obesity was examined. The results of this study can help health policymakers propose evidence-based measures to prevent and control obesity and overweight and reduce its associated complications.

Methods

Study design and population

This was a cross-sectional study based on data from the initiation phase of the Persian Kherameh cohort study, conducted in Kherameh City. The Persian Kherameh cohort is a part of an extensive population-based cohort study in the Islamic Republic of Iran. This cohort study

was designed in 2014. Its objectives and design, which involved 18 provinces of the country, have already been published (15). The main purpose of the cohort study was to identify the most common noncommunicable

diseases among Iranian ethnic groups and their related risk factors, and to explore effective methods of prevention. Kherameh City is in the south of Fars Province, with a population of 54 864 people.

All 10 663 participants aged 40–70 years who participated in the first phase of the Kherameh cohort study between 2014 and 2017 were included in our study.

After informed written consent was obtained from all participants in the cohort study, they were interviewed by trained experts using standard questionnaires which included demographic information, history of chronic diseases and family history of diseases (15). The team of the Persian cohort study assessed the validity and reliability of the questionnaire before implementing this project (15). The inclusion criteria of the cohort study were: age 40–70 years, resident of Kherameh and Iranian citizenship. Persons with mental disorders and any untreated disease in the acute phase, those unwilling to participate in the study and those who had not been referred to clinics designated for physical examination were excluded from the study.

Demographic and clinical information

Information on demographic characteristics, such as age, sex, marital status, place of residence, employment, educational level, ethnicity and socioeconomic status, was collected using a general questionnaire. The household and individual sections of the questionnaire collected information on the socioeconomic status of the respondents.

The blood pressure measurement protocol in the Persian Kherameh cohort required blood pressure to be measured twice. Anthropometric indices – weight (kg), height (cm) and waist circumference (cm) – were measured according to protocols proposed by the US National Institute of Health (15).

Definitions

General obesity was defined based on the standard BMI method recommended by the World Health Organization (WHO) (16): low weight (BMI