PUBLIC HEALTH 164 (2018) 91–98

Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Original Research

Economic burden of obesity and four obesity-related chronic diseases in rural Yunnan Province, China

Q. Li [a,b], Le Cai [a,*], W. Cui [a], G. Wang [a], J. He [a], A.R. Golden [a]

[a] School of Public Health, Kunming Medical University, 1168 Yu Hua Street, Chun Rong Road, Cheng Gong New City, Kunming 650500, Yunnan, China

[b] The First Affiliated Hospital of Kunming Medical University, Kunming, 650032, Yunnan, China

ARTICLE INFO

Article history:
Received 21 February 2018
Received in revised form
16 July 2018
Accepted 25 July 2018

Keywords:
Obesity
Obesity-related diseases
Economic burden
China

ABSTRACT

Objective: To analyze the economic burden of obesity and four obesity-related chronic diseases in rural Yunnan Province, China.

Study design: A community-based, cross-sectional study was conducted among rural residents in Yunnan Province. A multistage stratified random sampling approach was applied to collect a sample of the population aged ≥35 years in this region.

Methods: Questionnaires were conducted and measurements were taken from 5040 participants. A two-step model was used to measure direct economic burden of disease, whereas a human capital approach was applied to measure indirect economic burden.

Results: The prevalence of general obesity, central obesity, hypertension, diabetes, coronary heart disease, and stroke was 7.1%, 37.0%, 35.3%, 9.9%, 3.8%, and 1.7%, respectively, while obese participants as expected had a higher risk of the aforementioned four obesity-related illnesses than their counterparts ($P < 0.01$). The total, direct, and indirect costs of the four illnesses were $30,350.8 million, $28,642.5 million, and $1708.3 million, respectively, with 12.7% attributable to general obesity and 28.7% attributable to central obesity.

Conclusions: The economic burden of the four studied chronic diseases attributable to obesity in rural Yunnan Province is substantial. Interventions for controlling obesity should be applied to prevent obesity-related diseases and reduce the economic burden of disease.

© 2018 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

Introduction

Obesity is a global public health challenge.[1] In 2014, the global population estimated to suffer from obesity was 600 million. Among adults, 11% of men and 15% of women were obese.[2] Over the past two decades, China has undergone rapid economic development and currently displays characteristics of epidemiological transition. Along with these changes, Chinese

* *Corresponding author*. Tel.: +86 871 6592 2915.
E-mail addresses: qingli312@126.com (Q. Li), caile002@hotmail.com (L. Cai), Cuiwenlong972@126.com (W. Cui), wangguiyi41@126.com (G. Wang), hejianhui9804012@163.com (J. He), Allison.rabkingolden@gmail.com (A.R. Golden).
https://doi.org/10.1016/j.puhe.2018.07.024
0033-3506/© 2018 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

people have experienced striking alterations in their lifestyles, notably including increased consumption of calorie-dense food and increased adoption of sedentary behaviors. National surveys show that during the period 2010–2014, the prevalence of obesity increased significantly in China, moving from 5.4% to 7.3%.[3]

Obesity is a major risk factor for the development of several obesity-related non-communicable diseases.[4] These include overall and central obesity, which is a well-established risk factor for hypertension, cardiovascular diseases, and diabetes mellitus.[5–7] In addition, obesity is also associated with an increased incidence of cancer, including cerebrovascular cancer.[8,9]

Obesity and obesity-related diseases not only adversely affect health outcomes but also carry economic consequences. In 10 Western European countries, obesity-related healthcare costs were estimated to reach 10.4 billion euro.[10] In the Third National Health Services Survey of China, the medical expense attributable to being overweight and obese in China was $2.74 billion, equating to 3.7% of total Chinese medical consumption in 2003.[11]

Yunnan, a mountainous plateau in the southwest of China, is one of the most indigent areas in China. It has complex topography and a diverse climate and is home to 25 distinct ethnic minorities. In 2010, Yunnan Province had a population of 46.0 million (23.9 million male and 22.1 million female).[12] Data on the specific economic burden of obesity and obesity-related illnesses in Yunnan Province are scarce, especially for rural areas. Thus, quantifying the economic impact of obesity-related illnesses to inform public health policies and wellness services is an urgent challenge. Although obesity is related to numerous diseases, our community-based cross-sectional study focused on four illnesses: hypertension, diabetes, coronary heart disease (CHD), and stroke. These four diseases were selected firstly because of their strong association with obesity and secondly for reasons of data availability in rural areas of Yunnan Province. The present research endeavors to analyze the economic burden of obesity and four obesity-related chronic diseases in rural China.

Methods

Study population and region, design, participants, and sampling techniques

To obtain a representative sample, a multistage stratified random sampling approach was applied to collect a sample of the population aged ≥35 years from rural areas in Yunnan Province, China, based on a database of 129 counties in Yunnan. In the first step, based on the level of economic development (per capita gross domestic product [GDP], with the median value as the cutoff point), all counties in Yunnan Province were classified into two categories: economically advantaged (GDP≥$4454.9) and economically disadvantaged (GDP<$4454.9). Subsequently, one county was randomly picked out from every category. In the second step, the selected counties were divided into two groups—economically advantaged and economically disadvantaged—based on per capita GDP. One township was randomly selected from each of these two chosen groups, for a total of four townships. At the third step, three villages were selected by probability proportional to size from the four chosen townships, for a total of 12 villages. In the final step, 420 individuals aged ≥35 years were chosen from each selected village by simple random sampling. All study participants had lived in Yunnan for 5 years or longer.

Data collection and measurement

Eight medical students, seven MD students, and two doctoral candidates were trained as interviewers for data collection. Specifically, each interviewer was trained on how to administer the questionnaire, measure blood pressure and blood glucose, and take anthropometric measurements from participants.

Information on demographic characteristics, educational level, income, health status, self-reported diabetes, hypertension, CHD and stroke history, and family history of the four diseases of focus in the study was obtained. Information on annual disease expenditures, including expenses for outpatient visits, hospitalization, medication, transportation and accommodation for the patients and their family members during these visits, as well as long-term care expenditures (including nursing homes), and costs due to job absence were also recorded. All costs were adjusted to 2015 values using the consumer price index and subsequently converted from the Chinese yuan to American dollars using the official conversion rate in 2015 of ¥6.12 per $1.00.

Measurements obtained included weight, height, hip circumference (HC), waist circumference (WC), blood glucose, and blood pressure. Each measurement was taken by two interviewers with one using the instruments and the other recording the results. Weight and height were measured on a scale, with the subjects wearing light clothing and no shoes. To ensure the accuracy of the scales, before each measurement day, a known weight was placed on each scale to standardize the machine. HC was measured at the level of maximal gluteal extrusion.[14] WC was measured at the midpoint between the 12th rib and anterior superior iliac crest, with participants standing relaxed and in underclothes only.[13] After resting at least five minutes, each subject had three blood pressure measurements taken using a mercury sphygmomanometer. The blood pressure recorded was the average of these three readings. After an overnight fast of at least 10 h, subjects' peripheral blood glucose measurements were taken with a glucose meter (ACCU-CHEK, Roche, made in USA) from a finger-stick capillary sample.

Criteria for diagnosis

WC and body mass index (BMI) are two standards used to classify general obesity and central obesity. Obesity was defined by the following categories for BMI: obesity

Download English Version:

https://daneshyari.com/en/article/10134788

Download Persian Version:

https://daneshyari.com/article/10134788

Daneshyari.com