

Prevalence and Metrics Distribution of Ideal Cardiovascular Health: A Population-based, Cross-sectional Study in Rural China



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Background

The American Heart Association (AHA) introduced definitions of “ideal,” “intermediate,” and “poor” cardiovascular health (CVH) based on seven cardiovascular health metrics (smoking, body mass index, physical activity, diet score, total cholesterol, blood pressure, and fasting glucose). This study used this construct to assess the prevalence and metric distribution of CVH in a rural population with traditional lifestyles and investigate the relationship of CVH with socio-demographic characteristics of participants.

Methods

From January 2012 to August 2013, a representative sample of 11,113 adults (mean age 53.8 ± 10.6 years; 53.8% women) was enrolled from a rural population in Northeast China using a multi-stage, stratified random cluster-sampling scheme.

Results

According to the adjusted AHA criteria for CVH health metrics, there was 0.1% prevalence of ideal CVH (all seven health metrics at ideal levels), 11.7% of intermediate CVH (at least one health metric at intermediate level, but no poor health metrics), and 88.2% of poor CVH (at least one of seven health metrics at poor level). Women and young/middle-aged adults were more likely to have all of the ideal CVH metrics, behaviours, factors and CVH status.

Conclusions

Our study showed extremely low (0.1%) prevalence of ideal CVH in the rural population of northeast China. The poor CVH status, particularly among men and older individuals, underscores the need for urgent action on modifiable risk factors, especially blood pressure and smoking.

Keywords

Ideal cardiovascular health • Cardiovascular disease risk factors • Epidemiology • Prevention

Introduction

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in China and around the world, placing a heavy cost and life-years lost burden on the family and society [1–4]. To address the urgent need for CVD

prevention, the American Heart Association (AHA) set the 2020 Impact Goals in 2010 [5] and introduced new definitions of “ideal,” “intermediate,” and “poor” cardiovascular health (CVH) based on seven metrics: smoking status, body mass index (BMI), healthy diet score, physical activity level, and levels of blood pressure (BP), blood glucose, and total

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cholesterol (TC). In the ensuing years, epidemiological studies from the United States and other countries have shown surprisingly low prevalence of ideal CVH ranging from 0.1%–3.3% [6–17]. However, the latter studies were conducted in western industrialised countries or industrial cities in China, where “modernised” (in towns) lifestyles predominate. To our knowledge, the new construct of AHA’s “Ideal Cardiovascular Health” has not been applied to a rural population in China.

Liaoning province is a mountainous region, located in Northeast China. In rural villages, the vast majority of the inhabitants are involved in non-commercial agriculture performed by manual labour and the yearly per capita income is low. Migration accounts for only a small proportion of the population, so rural populations have similar socioeconomic background and dietary habits. People in these rural areas still retain traditional lifestyles such as working from sunrise to sunset, with intervening rest, and diet consisting largely of grains and low in meat. Furthermore, in rural areas, both men and women, old and young, engage in agricultural activities from sowing in spring to harvest in autumn, and gathering firewood in winter.

Therefore, the present study assessed CVH prevalence metrics distribution according to adjusted AHA criteria in a rural area of Northeast China where individuals predominantly follow the ‘traditional’ lifestyle, and investigated the relationship of CVH with socio-demographic characteristics of participants.

Methods

From January 2012 to August 2013, a representative sample of individuals aged 35 years or older was selected to describe the prevalence and risk factors of ideal CVH in rural areas of Liaoning Province. The study adopted a multi-stage, stratified random cluster-sampling scheme. In the first stage, three counties (Dawa, Zhangwu, and Liaoyang County) were selected randomly from rural areas of Liaoning province. In the second stage, one town was randomly selected from each of the three counties. In the third stage, 26 rural villages from the three towns were randomly selected. Participants who were pregnant, or with malignant tumour or mental disorders were excluded from the present study. A total of 14,016 eligible permanent residents aged 35 years or over from each village were invited to participate in the study and 11,956 participants (i.e. response rate of 85.3%) agreed to participate and completed the present study. Only participants with a complete set of data regarding the variables analysed in the present study were included, for a final sample size of 11,113 (5129 males and 5984 females), as shown in Figure 1. Written consent was obtained from all participants after they had been informed of the objectives, benefits, medical items and confidentiality of personal information. If the participants were illiterate, written informed consent was obtained from their proxies. The study was approved by the Ethics Committee of China Medical

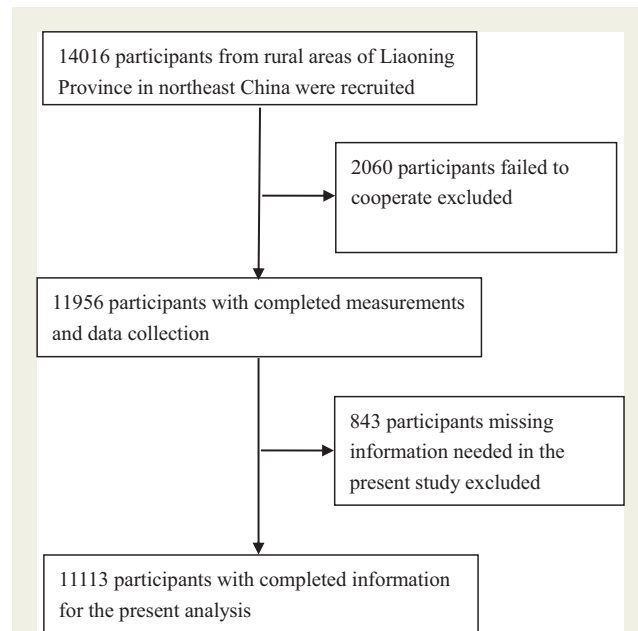


Fig. 1 Flow chart of study design.

University (Shenyang, China). All procedures were performed in accordance with ethical standards.

Our survey was performed by cardiologists and trained nurses during a single visit at a clinic in each village. Information on covariates, such as age, gender and lifestyle, were collected using a standard questionnaire by face-to-face interview. Before the survey was performed, all eligible investigators underwent training including study purpose and procedures, how to administer the questionnaire, standard methods of measurement, and importance of standardisation. Only those who scored perfectly on a strict test at the end of training were allowed to become investigators. During data collection, study inspectors offered further instruction and support as needed.

The present study used a standardised questionnaire to collect data during a face-to-face interview on demographic characteristics, lifestyle risk factors, dietary habits, family income, among other variables. Participants were stratified by age into four groups: age 35–44, age 45–54, age 55–64 and age 65 or over. Their marital status was categorised into two groups: married or living with partner; and unmarried, divorced or widowed. Ethnicity was classified as Han or others (including ethnic minorities in China, such as Mongol and Manchu). Family income was classified as 5,000 or less, 5,000 – 20,000 and 20,000 or over, CNY/year. Educational level was categorised as low (no schooling, incomplete primary education, and primary education), middle (three or four years of secondary education), and high (college and university education). Self-reported sleep duration (including nocturnal and nap duration) was categorised into four groups: seven hours or less, seven to eight hours, eight to nine hours and over nine hours daily. Study participants were asked whether or not they currently drank alcohol (two or more times/week for at least one year).

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