

Diabetes - Endocrinology 2018 : Prevalence and trends of obesity and overweight in chinese adults, 2004- 2013 - J Shen - Immunological Genetics and HLA Typing

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Background and Aims: Large-scale epidemiologic studies to assess the increased prevalence of obesity in China, and relate this increase to economic development, are lacking. In 2001, the China Marrow Donor Program (CMDP) began collecting anthropometric data on volunteers and information on >1.8 million individuals from 31 branch registries are currently available. **Materials and methods:** CMDP data from 1,163,094 healthy adults examined in years 2004-2013 were included in a cross-sectional analysis to estimate the yearly prevalence of obesity and overweight. The annual per capita Gross Domestic Product (GDP) was used to evaluate the relationship between economic growth and obesity. All statistical analyses were conducted with the use of SAS for windows version 9.2 software (Research Triangle Institute). Approximate power calculations were performed using StatCalc (Sample Size and Power for Population Survey) in Epi Info version 7 (National Cancer Institute, USA), assuming a survey design effect of 1.5. The sample sizes for the groups with the smallest sample size were sufficient to estimate the prevalence with confidence limit of 0.05 with more than 80% power; most of the estimates can achieve more than 90% power. **Results:** In 2013, the age and sex-standardized prevalence of obesity and overweight among Chinese adults was 10.16% and 32.40%, affecting 86.10 and 257.38 million individuals, respectively. The prevalence of obesity and overweight increased with increasing age, and were higher in males (13.08% and 38.66%) as compared to females (7.48% and 22.81%). From 2004 until 2013, the prevalence of obesity increased from 6.38% to 10.16% where the increase was greater from 2011- 2014 as compared to 2004-2010. Females had a greater increase in recent years as compared to males, suggesting that differences by gender are becoming smaller. Among poorer provinces, the prevalence of obesity rose sharply with increasing GDP, whereas among developed regions, there was a nominal increase in obesity with increasing GDP. **Conclusion:** The prevalence of obesity and overweight are dramatically increasing in recent years in China, especially among women and in regions with

previously low GDP. Strategies aimed at preventing and treating obesity are needed.

Results

This study enclosed twelve,543 participant. From 1989 to 2011, the median BMI of males and females accumulated by a pair of 65 kg/m² and one.90 kg/m², severally; and WC accumulated by eight.50 cm and seven.00 cm, severally. In 2011, the age-adjusted prevalence of overweight, general fatness, and abdominal fatness were thirty eight.80% (95% CI: thirty seven.95–39.65%), 13.99% (95% CI: thirteen.38–14.59%), and 43.15% (95% CI: forty two.28–44.01%), severally, and considerably accumulated across all cycles of the survey among all subgroups (all P < 0.0001). The age-adjusted prevalence of grade 1–3 fatness considerably accumulated in total sample and sex subgroups (all P < 0.0001). For all indicators, there have been vital will increase in annual ORs among all subgroups (all P < 0.0001), with the exception of grade a pair of fatness. vital variations were ascertained in ORs across the 3 age teams in males. And ORs considerably attenuated with age.

Conclusions

The age-adjusted prevalence of overweight, general fatness, and abdominal fatness considerably accumulated among Chinese adults from 1989 to 2011. The fatness population is trending toward AN accumulated proportion of males and younger people in China.

Background

Overweight and fatness area unit vital lifestyle-related public health issues worldwide. Since fatness is related to the common chronic diseases, as well as disorder, kind a pair of polygenic disease, cardiovascular disease, dyslipidemia, and bound sorts of cancer, and regarded because the fifth leading risk factors for mortality globally, obesity-related problems have

drawn additional and additional attention from researchers in recent decades. Therefore, it's necessary to analyze and monitor the trends within the prevalence of overweight and fatness to boost awareness and build preventive methods within the public health field.

In recent years, the prevalence of overweight and fatness has reached epidemic proportions in China. around 2

hundredth fatness people worldwide area unit Chinese. The extensive increase within the prevalence of fatness is attributed to the adoption of a Western modus vivendi and attenuated physical activity. the standard Chinese diet, characterised by a high supermolecule content composed of rice, wheat, and overdone vegetables, is shifting to a diet with higher fat. The high intake of energy and fat combined with a decrease in physical activity area unit accountable for the increasing prevalence of overweight and fatness within the Chinese population, particularly among urban inhabitants. portrayal the trends within the prevalence of fatness can facilitate elucidate the prevalence of obesity-related chronic diseases and alert health care professionals and also the public to forestall the epidemic.

Body mass index (BMI) may be a common indicator wont to determine general fatness. Waist circumference (WC) will offer info on the distribution of body fat and is powerfully correlate with central fat localization. Therefore, BMI and WC were wont to outline general and abdominal fatness during this study, respectively. Since ethnicities and dietary patterns area unit completely different in several countries, the prevalence and extent of fatness vary. Previous studies have reported that Asians have higher body fat content than Western individuals with constant BMI. Therefore, specific cut-offs of BMI ought to be wont to outline overweight and fatness in several countries. during this study, ethnicity-based cut-offs for BMI were wont to outline overweight and fatness in keeping with the World Health Organization recommendations for Chinese individuals. supported the China Health and Nutrition Survey (CHNS), the aims of this study were to analyze the trends within the prevalence of overweight, general fatness, and abdominal fatness additionally because the distributions of BMI and WC among the Chinese population. As a

result, this study would offer additional comprehensive and correct proof of the trend and distribution of general and abdominal fatness throughout the last 3 decades in China.

Methods

As AN current open cohort and international cooperative project between the geographical area Population Center at the University of North geographical area at Chapel Hill and also the National Institute for Nutrition and Health (NINH, at one time the National Institute of Nutrition and Food Safety) at the Chinese Center for unwellness management and hindrance (CCDC), the CHNS was designed to look at the results of the health, nutrition, and birth prevention policies and programs enforced by national and native governments. what is more, however the social and economic transformation of the Chinese society has effects on the health and biological process standing of its population is explored during this survey. 9 provinces variable considerably in earth science, economic development, public resources, and health indicators area unit coated within the CHNS. A period, random cluster method was wont to acquire the samples in every province. Counties within the 9 provinces were stratified by financial gain (low, middle, and high). And a weighted sampling theme was wont to at random choose four counties from every province. additionally, the urban center and a lower financial gain town were designated once feasible; but, different massive cities instead of provincial capitals had to be designated in 2 provinces. Villages and townships among the counties and urban/suburban neighborhoods among the cities were designated at random. The sample is numerous, with variation during a wide-ranging set of socioeconomic factors (income, employment, education, and modernization) and different connected health, biological process, and demographic measures. owing to the long period and wide geographic coverage, the CHNS will represent the population demographics of China and document the dramatic economic, social, behavioral, and health standing changes that have compact China. the primary spherical of the CHNS was conducted in 1989, and also the survey was after conducted in 1991, 1993, 1997, 2000, 2004, 2006, 2009, and 2011. a close description of the survey style and procedures has been printed elsewhere.

Study Population

Analysis was supported knowledge from eight waves of the CHNS conducted from 1991–2011 antecedently noted, as knowledge weren't collected for all age teams within the 1989 survey. This study centered on adults aged ≥ 20 years in every survey year and knowledge provided info on age, sex, urban–rural standing, and elaborated physical examinations as well as weight and height. To limit biases caused by pre-existing factors, this analysis excluded participants UN agency had been diagnosed with gestation or were wet. additionally, participants with missing info on height or weight or extreme or implausible height (<120.0 cm) or BMI (<15.0 or >40.0) values were excluded. Anthropometric ways and Definitions of Overweight and fleshiness Weight and height were measured by trained physicians following standardized protocols from UN agency. The weight of participants wearing lightweight wear was measured while not shoes to the closest zero.1 weight unit with a mark steelyard (Seca North America, Chino, CA). the peak of barefoot subjects was measured to the closest zero.1 cm employing a moveable stadiometer (Seca North America). BMI was calculated as weight in kilograms divided by the peak in meters square, rounded to at least one decimal place. According to the standards of the working party on fleshiness in China (WGOC),18 general fleshiness was outlined as BMI ≥ 28.0 and traditional weight was outlined as BMI <24.0 . supported UN agency recommendations,16 traditional weight was outlined as BMI <25.0 , and general fleshiness was outlined as BMI ≥ 30.0 for adults aged ≥ 20 years.

Statistical Analysis:

All applied math analyses were conducted victimization SPSS, version 13.0, in 2013. The sample sizes were spare to find associate annual increase of zero.05 share points with $>90\%$ power. Analyses were stratified by sex, age group, and degree of urbanization (urban versus rural). supported the age at the interview, age was classified into 20–39 years, 40–59 years, and ≥ 60 years. Taking under consideration unequal chances of choice, the values of overweight and fleshiness were adjusted by direct methodology for the 2010 census of the Chinese adult population victimization the corresponding age teams.

Trends within the prevalence of fleshiness (BMI ≥ 28.0 or BMI ≥ 30.0) and of overweight and fleshiness combined (BMI ≥ 24.0 or BMI ≥ 25.0) among participants from 1991 to 2011 were assessed by linear-by-linear trend testing. provision regression was used to more assess the changes in fleshiness throughout the eight waves of the CHNS, further because the differential increase rate by sex with associate interaction term (sex \times survey time). The age-adjusted prevalence fleshiness estimate from the foremost recent knowledge (2011 CHNS) was compared between men and girls victimization the chi-square check. A two-tailed p-value <0.05 was thought of statistically vital. additionally, comparisons of the prevalence estimates between Chinese adults within the 2011 survey and also the U.S. population from the 2011–2012 National Health and Nutrition Examination Survey (NHANES) were conducted. rectilinear regression was applied to assess the trends in log-transformed BMI. To more examine trends in BMI, elite percentiles were graphed by sex and degree of urbanization. Sensitivity analyses enclosed analyzing the laic trend of fleshiness among Chinese adults from 1991 through 2011 supported the inclusion criteria.

Results

Pregnant (n=452) or wet (n=440) ladies were excluded from knowledge analysis. in addition, participants with missing knowledge (n=4,027), extreme height (n=75), or extreme BMI values of <15.0 or >40.0 (n=234) were additionally excluded. The remaining participants aged ≥ 20 years were eight,142 for 1991; seven,776 for 1993; eight,282 for 1997; nine,184 for 2000; eight,966 for 2004; eight,982 for 2006; nine,297 for 2009; and twelve,249 for 2011. Sample sizes for analyses of the eight waves of the CHNS for one991–2011 area unit elaborated info on the age-adjusted prevalence of fleshiness and of overweight and fleshiness combined for the sample and by age and sex from the 1991–2011 CHNS.

In the 2011 survey, the age-adjusted mean and median BMI values were twenty three.8 (95% CI=23.7, 23.9) and 23.7 (interquartile vary, 21.4–26.0) for men, and 23.4 (95% CI=23.2, 23.5) and 23.4 (interquartile vary,

21.2–26.0) for ladies, severally. Tests for trends in log-transformed mean BMI over the 20-year amount from 1991 through 2011 showed important will increase in each men (p <0.01) and ladies (p <0.01). Trends in BMI were just like blubber trends. Notably, the rise within the calculable median BMI was a lot of higher in men (2.6) than in girls (1.9) (p <0.05). To any describe changes within

the distribution of BMI by sex and region (urban and rural), we tend to calculated elect percentiles, with results. For each men and ladies, the calculable median BMI (50th percentile) was a lot of higher in 2011 than in 1991 inside each regions. In every survey, the median BMI in urban areas was more than that in rural areas in each men and ladies from 1991 through 2011; but, the will increase within the median BMI in rural areas were comparatively higher. The changes within the BMI distribution by cohort and region (urban and rural). We conducted sensitivity analyses for the profane trend of blubber among Chinese adults from 1991 through 2011 supported the inclusion criteria. No important variations were discovered (data not shown). These analyses recommended that the prevalence of blubber among each men and ladies accumulated considerably from 1991 through 2011.

Discussions:

The present information show putting will increase within the prevalence of BMI-defined blubber and overweight in adults in China over the 20-year amount from 1991 through 2011 for each men and ladies. Remarkably, each the prevalence of blubber and also the combined prevalence of overweight and blubber accumulated earlier among men than girls. Meanwhile, there was a major rising tendency in log-transformed mean BMI from 1991 through 2011 each for men and ladies. Notably, the changes of BMI in men were notably pronounced compared with those in girls.

Because of variations in sampling, study style, and interrupt points for blubber and overweight standing, it's difficult to create international comparisons of blubber and BMI. However, for estimates supported measured information, the prevalence of blubber among the Chinese population is considerably lower compared with the U.S. population, however the prevalence of overweight among the Chinese population is far nearer to it among

the U.S. population.¹⁹ though the blubber prevalence doesn't appear to be outstanding compared therewith of the U.S., cyberspace population of blubber among the Chinese is almost the very best within the world.²⁰ NHANES information for the U.S. population showed that it took nearly forty years for

the blubber prevalence to achieve a stable state, covering the 1960–2000 amount.^{19,21} If the prevalence of blubber among the Chinese population reaches a stable standing as within the U.S. population, it'll still increase over ensuing few years. In different words, if the rise in blubber continues with none effective interventions, China can follow within the footsteps of the U.S. into AN blubber crisis. This study indicates that will increase in weight ar continued, particularly among men, that is in accordance with previous studies. but, Wang and colleagues⁹ solely targeted on analyzing participants aged 20–45 years from 1989 to 2000. because the population in our analysis was aged ≥ 20 years information from 1991 through 2011, our study is a lot of representative of this population. to boot, Wang et al. in the main according trends within the distribution of BMI, however our study is a lot of comprehensive because it includes each the prevalence of blubber and trends within the BMI distribution. Further, individuals in

China, furthermore as many different Asian Pacific populations, have the next risk for obesity-related diseases at a lower BMI than Caucasians, so our analysis provides estimates of prevalence supported the lower BMI interrupt points. The findings of AN elevated prevalence of blubber and overweight ar in keeping with those from previous studies on blubber outlined by BMI with a a lot of rigorous interrupt purpose.

In this study, a dramatic increase within the prevalence of overweight and blubber was discovered among Chinese adults from 1991 through 2011. This increase occurred among men and ladies all told studied age teams. The conferred estimates supply a practical image of overweight and blubber prevalence in China, that is useful for predicting trends in their changes. In past 3 decades, peoples' lifestyles have modified greatly in China. The accumulated use of motorized transportation, consumption of high-fat food, and bigger TV viewing time are thought-about contributors to the accumulated blubber prevalence.

Given this prevalence of overweight, the massive population, and different chronic diseases,^{33–36} China is facing the implications of obesity-related health issues. The magnitude of the will increase within the prevalence of overweight and blubber foretell a considerable increase in chronic diseases within the next many decades.

These information concern immediate measures of weight management and hindrance programs for overweight and blubber among Chinese adults to

forestall chronic sickness epidemics and harmful obesity-related health outcomes.

Limitations and Strengths

In past 3 decades, more individuals have migrated from rural areas to cities in China. We tend to enclosed information from participants from 3 giant cities to mirror the changes in urbanization. quite twenty years of coverage permits U.S. to check the impact of your time on the prevalence of overweight and blubber. The analysis comparison the prevalence of overweight and blubber in China and also the U.S. can facilitate U.S. perceive the variations between developing and developed countries. There are limitations during this study. The studied population was from solely a little of China, so caution ought to be taken once generalizing the results and conclusion as a mirrored image the national condition. Risk factors and their impact on the rise of overweight and blubber ought

to be analyzed during a future study.

Conclusions

The prevalence of overweight and blubber among each Chinese men and ladies accumulated considerably from 1991 through 2011. These estimates counsel that the will increase in weight are continued, notably among men.

Biography :

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