

Waist Size, Body Shape and Health

Key Messages

Central obesity with apple body shape is associated with increased risks of cardio-metabolic disorders and various chronic diseases.

For most Asian adults including Chinese, central obesity is defined as having a waist circumference 90 centimeters (cm) or above for men and 80 cm or above for women. A waist-to-hip ratio at 0.90 or above for men and 0.85 for women would also signify central obesity.

Among local persons aged 15–84, the Population Health Survey 2020-22 revealed that 37.8% and 35.4% of them were classified as centrally obese when defined by waist circumference and waist-to-hip ratio, respectively.

To reduce the risk of obesity and having a pot belly, members of the public are urged to lead a healthy lifestyle that includes eating a balanced diet, refrain from alcohol drinking, being physically active and reducing sedentary behaviours.

Introduction

Body fat content and deposition vary between individuals and so people come in different body shapes and sizes. 'Apple' and 'pear' are the two common body shape descriptions used to reflect where excess fatty tissues are accumulated. For people who have apple-shaped bodies, they store fat in the abdominal cavity, surrounding internal organs such as the liver and pancreas. Medically, this is known as central obesity. For pear-shaped people, they tend to store more fat under the skin on the hips, buttocks and thighs. Independent of overall obesity, studies consistently show that apple shaped obesity is associated with increased risks of cardio-metabolic disorders^{1, 2}.

This article shows how to use waist circumference and waist-to-hip ratio to reflect central obesity, provides an overview of the potential health consequences associated with central obesity, reports the waist circumference and waist-to-hip ratio among the local population with suggestions for keeping a healthy waistline and reducing the risk of obesity.



Apple Shaped Obesity



Pear Shaped Obesity

Waist Circumference and Waist-to-Hip Ratio

Both waist circumference and waist-to-hip ratio are commonly used anthropometric indices of abdominal fatness³. Although waist and hip circumferences appear easy to measure, variations in measurement can be induced by site of measurement, standing posture or respiratory phase⁴. Measurement error would also occur if the tape is pulled too tight or loose, or if subjects wear clothes with belts or full pockets. Box 1 illustrates how to properly measure waist and hip circumferences as well as calculation of waist-to-hip ratio. Getting assistance from another person may provide more accurate results.

For most Asian adults including Chinese, central obesity is defined as having a waist circumference 90 centimeters (cm) or above for men and 80 cm or above for women⁵. A waist-to-hip ratio at 0.90 or above for men and 0.85 for women would also signify central obesity⁵. In general, the larger the waist circumference or the higher the waist-to-hip ratio, the greater the chronic disease risk.

Box 1: Proper ways for measurement of waist and hip circumferences and calculation of waist-to-hip ratio³

Equipment

- Use a graduated, constant tension tape

Preparation

- The measurement should be taken directly over the skin. If this is not possible, the measurement may be taken over light clothing

Measure waist circumference

- Stand with the feet together with weight evenly distributed across both feet
- Position the measuring tape at the mid-point of the last palpable rib and the top of the hip bone, making sure to wrap the tape over the same spot on the opposite side
- Make sure to keep the tape snug but not tight enough to cause compression of the skin
- Take the measurement at the end of a normal expiration and record the measurement at the level of the tape to the nearest 0.1 cm

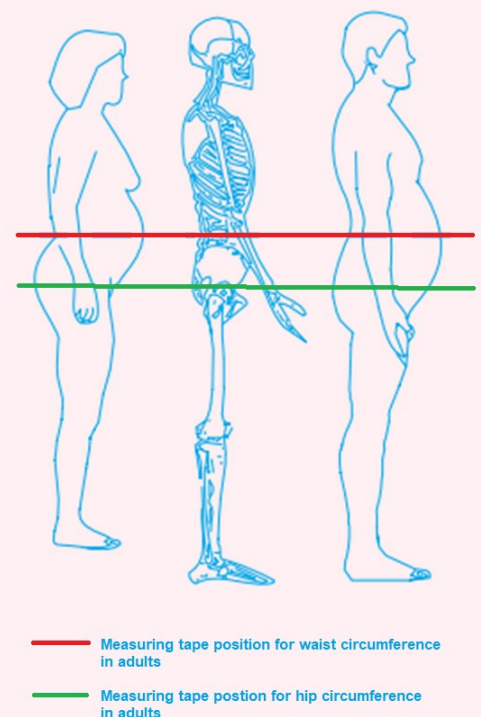
Measure hip circumference

- Stand with the feet together with weight evenly distributed across both feet
- Position the measuring tape around the maximum circumference of the buttocks
- Make sure to keep the tape snug but not tight enough to cause compression of the skin
- Record the measurement at the level of the tape to the nearest 0.1 cm

Waist-to-hip ratio calculation

- Divide waist circumference by hip measurement, e.g.

$$\text{Waist measurement (90 cm)} \div \text{Hip measurement (71 cm)} = \text{Waist-to-hip ratio (1.27)}$$



Potential Health Consequences associated with Central Obesity

Through some biological mechanisms (Figure 1)⁶, an apple-shaped body with excessive fat accumulation in the abdominal cavity increases the risk of developing various chronic diseases, including cardiovascular diseases (such as hypertension and coronary heart disease)^{1, 2}, stroke^{1, 7}, type 2 diabetes^{1, 8}, non-alcoholic fatty liver disease⁹ and certain cancers (such as colorectal cancer, pancreatic cancer and post-menopausal breast cancer)^{10, 11}. Epidemiological studies showed that each 10 cm increment in waist circumference was associated with 11% higher risk of all-cause mortality, whereas every 0.1 unit increment in waist-to-hip ratio was associated with 20% higher risk of death¹².

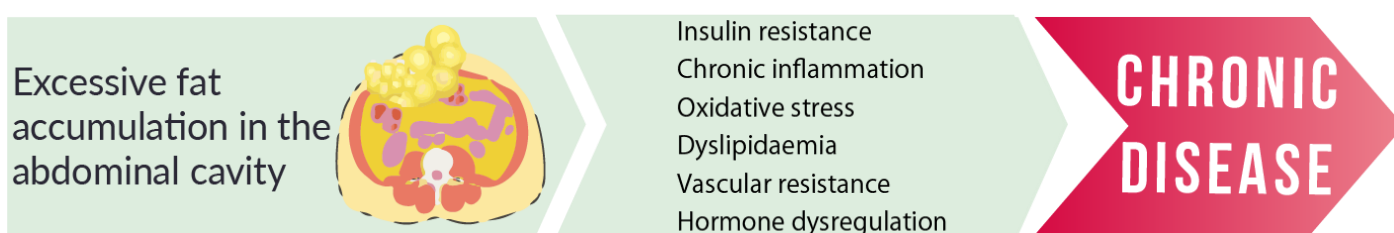


Figure 1: Biological mechanisms of central obesity on chronic disease development

Waist Circumference and Waist-to-Hip Ratio among the Local Population

Among local persons aged 15–84, the Population Health Survey 2020-22 revealed that the mean values of waist circumference were 86.4 cm for males and 77.7 cm for females; the mean values of waist-to-hip ratio for males and females were 0.88 and 0.82 respectively (Figure 2)¹³.

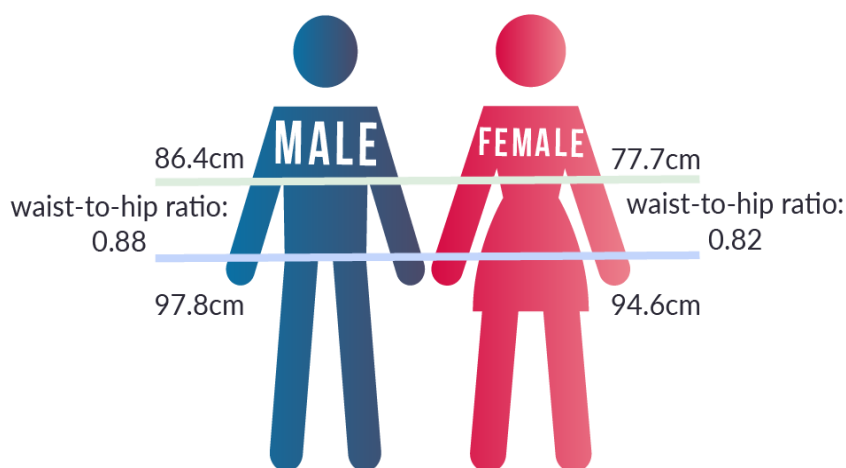


Figure 2: Mean waist circumference and waist-to-hip ratio among persons aged 15–84 by gender

Analysed by age group, the proportion of persons with central obesity defined by waist circumference (90 cm or above for males; 80 cm or above for females) increased with age from 15.7% for those aged 15–24 to 49.2% for those aged 65–84 (Figure 3). Similarly, the corresponding proportion of persons with central obesity defined by waist-to-hip ratio (0.90 or above for males; 0.85 or above for females) increased from 9.4% among persons aged 15–24 to 60.2% among persons aged 65–84 (Figure 4)¹³.

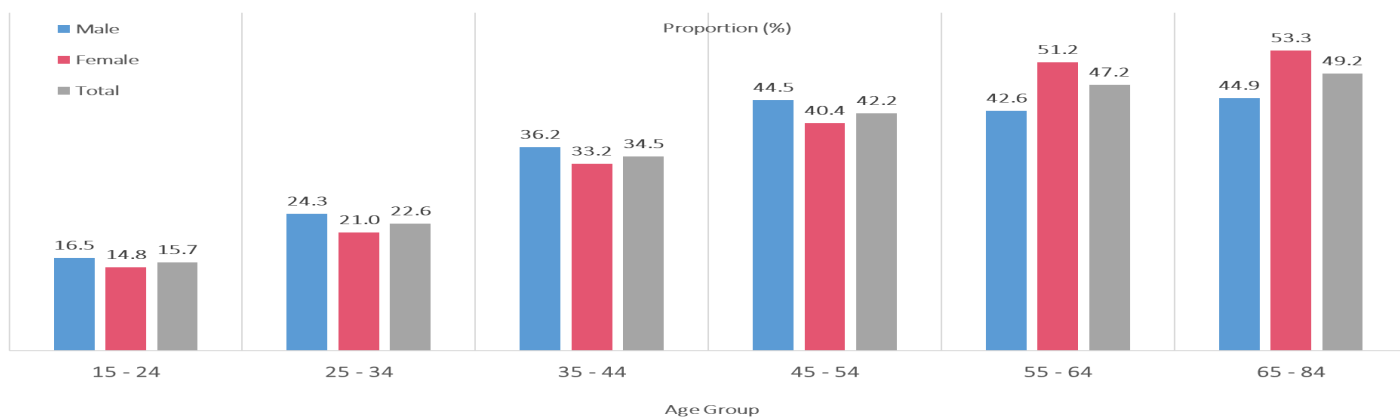


Figure 3: Proportion of persons aged 15–84 with central obesity defined by waist circumference by gender and age group

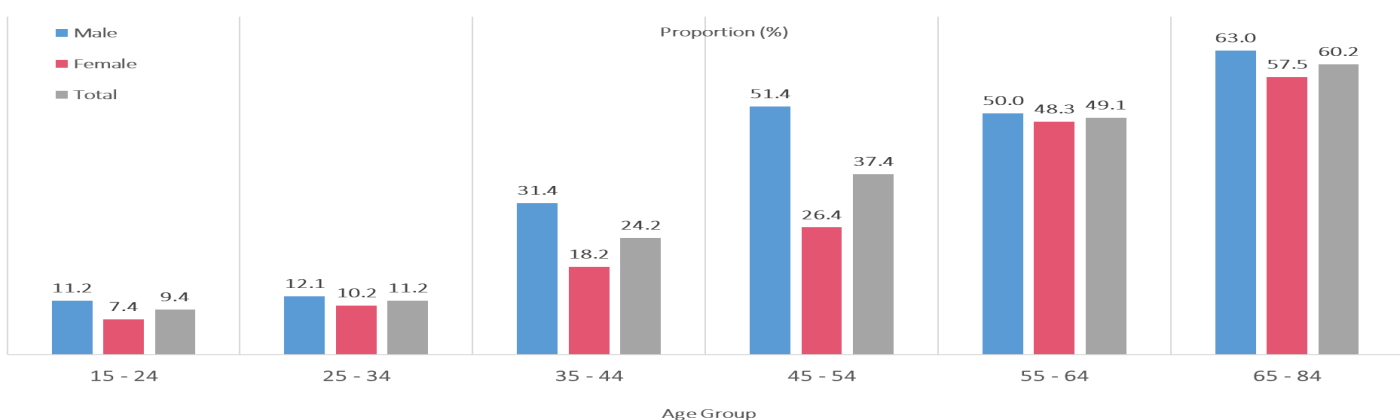


Figure 4: Proportion of persons aged 15–84 with obesity defined waist-to-hip ratio by gender and age group

Overall, 37.8% (36.8% for males and 38.7% for females) and 35.4% (39.9% for males and 31.4% for females) of persons aged 15–84 were classified as centrally obese when defined by waist circumference and waist-to-hip ratio, respectively (Figure 5)¹³.

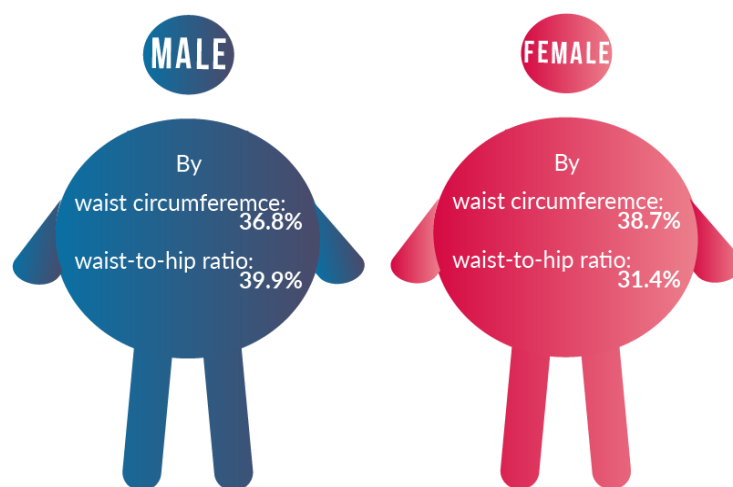


Figure 5: Proportion of persons aged 15–84 being classified as centrally obese by gender

Maintaining an Optimal Waistline and Body Weight

The tendency to accumulate excessive body fat around the middle is affected and mediated by genetics, age, sex and related hormones¹⁴. Certain lifestyle factors also play an important role. Apart from consuming too many calories from unhealthy diet¹⁵ and burning up too few calories with insufficient physical activity¹⁶, too much alcohol can add extra calories to the diet, which can contribute to weight gain in some people¹⁷. Alcohol also inhibits the breakdown and usage of fats as energy and favours fat accumulation, particularly in the liver and abdominal area¹⁸.

To reduce the risk of obesity and having a pot belly, members of the public are urged to lead a healthy lifestyle (Box 2). For more information about healthy living, please visit the Change for Health website of the DH at www.change4health.gov.hk.

Box 2: Healthy living to reduce the risk of obesity and central obesity

✓ Eat a balanced diet

Members of the public are urged to eat according to the “Healthy Eating Food Pyramid”¹⁹, including consuming at least 5 daily servings of fruit and vegetables for adults, choosing more whole grains over refined grains, as well as limiting fats, salt and sugar intake.

✓ Refrain from alcohol drinking

Drinkers are urged to take a look at their own drinking habits by using the electronic alcohol screening and brief intervention tool (e-SBI, accessible at www.change4health.gov.hk/en/alcohol_aware/questionnaire/index.html), realise the potential health risks associated with alcohol drinking, and appreciate the health benefits of reducing or even stopping alcohol drinking.

✓ Be physically active

Aerobic exercises help burn up extra calories and unnecessary fat. For substantial health benefits, the World Health Organization recommends persons aged 18 or above to do at least 150–300 minutes of moderate-intensity aerobic physical activity (such as brisk walking), or 75–150 minutes of vigorous-intensity aerobic physical activity (such as jogging), or some combination of both with equivalent energy expenditure throughout the week²⁰. These can be combined with abdominal exercises (such as sit-ups and stomach crunch with legs raised) to tone abdominal muscles.

✓ Reduce sedentary behaviours

Members of the public are urged to limit the time spent being sedentary and replace sitting time with physical activity of any intensity, including light-intensity physical activity (such as light walking)²⁰. Individuals can pace around while using the phone, stand or step on the spot while watching television, and stand up while folding laundry or ironing.

The Government of the Hong Kong Special Administrative Region is committed to stepping up the prevention and control of obesity and striving to halt the rise of obesity. The Department of Health will continue to organise health promotional campaigns using a variety of strategies to enhance public awareness about the importance of healthy living in reducing the risk of obesity and having a pot belly, as well as working in close partnership with relevant stakeholders and community partners to foster a health enhancing environment.



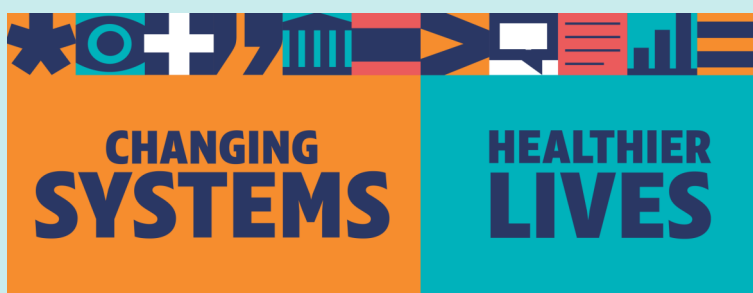
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World Obesity Day is observed annually on the fourth of March. Convened by the World Obesity Federation in collaboration with its global members, it calls for a cohesive cross-sector response to the obesity crisis.

For 2025, the theme is “Changing Systems Healthier Lives”.



We must recognise obesity as a complex, and chronic disease, and one that is also a driver of other diseases. Taking action on obesity is a critical step in reducing the global burden of other chronic diseases including diabetes, heart disease and cancer.

Together, governments, health professionals, advocates and the public can transform the systems and environments that are contributing to the increasing rates of obesity and build a healthier future for people all over the world.

For more information about World Obesity Day, please visit the thematic website at www.worldobesityday.org/.

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