

## Profiles and Prevalence of Abdominal Obesity Among Dubai Adult Cohort (18-59): The Layout of Margins and Patterns of Associates, A Community Based Approach

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### Abstract

**Background:** Abdominal obesity which is frequently known as central obesity as well, occurs due to excessive accumulation of fat around the stomach and abdomen. This can reach to an extent that it is likely to produce a negative impact on health. According to evidences generated by literatures, Central obesity obviously linked to multiple morbidities like, cardiovascular diseases [1], Alzheimer's, as well as metabolic disorders.

**Objectives and Methodology:** A cross-sectional observational study designed to collect recent data on consumer dietary habits, anthropometric data, and physical activity secondary data of three success house hold health surveys carried out on 2245 individual in Dubai (2009, 2014, 2019), sampling, survey design, data collection, data weighting and data analysis has been carried out based on advanced statistical and epidemiological applications to ensure the validity and reliability of the survey outcomes. Hip circumference as well as waist circumference has been (Waist circumference (WC) were analyzed by age group and region. Abdominal obesity was defined as a WC  $\geq 90$  cm for men and WC  $\geq 80$  cm for women based on World Health Organization (WHO) recommendations for Asians.

**Results:** The mean waist circumference for adult women was 91.2 cm compared to 94.1 cm for men (18+). Moreover, the mean hip circumference was 104 cm for females compared to 100.7 for males. The proportion of adult men and women with abdominal/central obesity (waist circumference of  $\geq 102$ cm for men and  $\geq 88$  cm for women). This shows a direct relationship between age and increased central obesity, as 21.2% of the youth surveyed had central obesity and this percentage increased gradually up to 69.1% among the older age group (60+). The study shows the difference in central obesity by gender and nationality. It reveals that almost four in ten of the adults surveyed (39%) have central obesity (as measured by waist circumference). The proportion of men aged 18 and over with a raised waist circumference (26.7%) was significantly lower than women (58.8%) were. In addition, Nationals who had a central obesity (58.1%) due to raised waist circumferences were significantly more than non-Nationals were (30.3%). Among the sampled adults, half of them (52.8%) had abdominal obesity (by waist-to-hip ratio). This percentage increases gradually by age starting from 29.7% among the age group 18-24 yrs. up to 80.9% in the eldest age group. This raised waist to hip ratio was almost similar in Nationals (50.0%) and non- Nationals (54.5%), however, males were much more likely to have abnormal waist-to-hip ratio than females (63.5% of men compared with 37.2% of women),

**Conclusions:** Central obesity is challenging problem among Dubai adult population, about 43% have got abdominal obesity significantly associated with age, gender and nationality.

**Keywords:** Abdominal Obesity; Margins; Associates

### Introduction

Abdominal obesity which frequently known as central obesity as well, occurs due to excessive accumulation of fat around the stomach and abdomen, which reach could reach to the extent that it is likely to produce a negative impact on health. According to evidences generated by literatures, Central obesity obviously linked to multiple morbidities like, cardiovascular diseases [1], Alzheimer's, as well as metabolic disorders [2]. Central and visceral overloaded fat along with waist circumference revealed a strong

linking with type 2 diabetes [3]. Obesity per say recognized as a major risk factor for hypertension, type 2 diabetes, coronary heart disease, and certain types of cancer [1-6]. Classification of Obesity divided into two main categories, general obesity which (defined as body mass index  $\geq 30$  kg/m<sup>2</sup>) and Central obesity which (defined as waist circumference [WC]  $\geq 90$  cm for men and WC  $\geq 80$  cm for women), reference to World Health Organization (WHO) recommendations for Asians [7,8] in particular, central obesity has a close relation with abdominal fat accumulation and cardiovascular disease, independently of general obesity [9-11].

The size of abdominal obesity problem is currently increasing worldwide dramatically [12-14]. In USA, the general age-adjusted prevalence of central obesity significantly increased from 46.4% (95% confidence interval [CI], 42.1%–50.8%) in 1999–2000 to 54.2% (95% CI, 51.3%–57.0%) in 2011–2012 [12]. Similarly, there has also been a large increase in the number of adults with abdominal obesity in China [15,16]. For example, in Shanghai, the prevalence of abdominal obesity increased from 17.3% (95% CI, 16.2%–18.4%) during 1998–2001 up to 22.4% (95% CI, 21.2%–23.7%) During 2007–2008 [16] nevertheless, most previous studies noticeably focused on specific cities. As for China Health and Nutrition Survey (CHNS) which, was a recent large-scale longitudinal, household-based survey in China [17]. Data from the CHNS for the period 1993–2009 show that mean WC values increased from 76.5 cm to 83.5 cm among men and from 74.5 cm to 79.2 cm among women [18], furthermore the prevalence of central obesity significantly increased in all sex and age groups [18]. In a year of 2011 [19] reported that the Chinese age-adjusted mean Waist circumferences was 83.2 cm for men and 78.1 cm for women.

### Objectives

To study the prevalence of abdominal obesity among Dubai adult population. To study the associated factors.

### Methodology

A cross-sectional observational study designed to collect recent data on consumer dietary habits, anthropometric data, and physical activity secondary data of three success house hold health surveys carried out on 2245 individual in Dubai (2009, 2014,2019), sampling, survey design, data collection, data weighting and data analysis has been carried out based on advanced statistical and epidemiological applications to ensure the validity and reliability of the survey outcomes. Hip circumference as well as waist circumference has been (Waist circumference (WC) were analyzed by age group and region. Abdominal obesity was defined as a WC  $\geq$ 90 cm for men and WC  $\geq$ 80 cm for women based on World Health Organization (WHO) recommendations for Asians.

Well-trained professional interviewers who participated in specific training seminars developed by the study authors took all individual anthropometric measurements. Standard international procedures were followed after prior testing in a pilot study. The measurements were performed with participants in the standing position, barefoot, and with lightweight clothing. Height was measured in centimeters using a Seca 213 portable audiometer (Seca GmbH and Co. Kg.; Hamburg, Germany) (range, 0-200 cm; precision, 0.1 cm). Body weight was obtained using calibrated Seca 803 digital scales (range, 0.1-150 kg; precision, 0.1 kg). Waist. Waist circumference was measured at the midpoint between the last costal margin and the iliac crest, and the hip circumference was measured horizontally around the largest circumference on the buttocks. Both circumferences were measured 3 times with a Seca 201 no stretch measuring tape (range, 0-150 cm; precision, 0.1 cm). The BMI was calculated as weight (kg) divided by the square

of the height (m). In addition, the waist-to-hip ratio (WHR) was calculated as WC (cm)/hip circumference (cm). The WHtR was calculated as WC (cm)/height (cm).

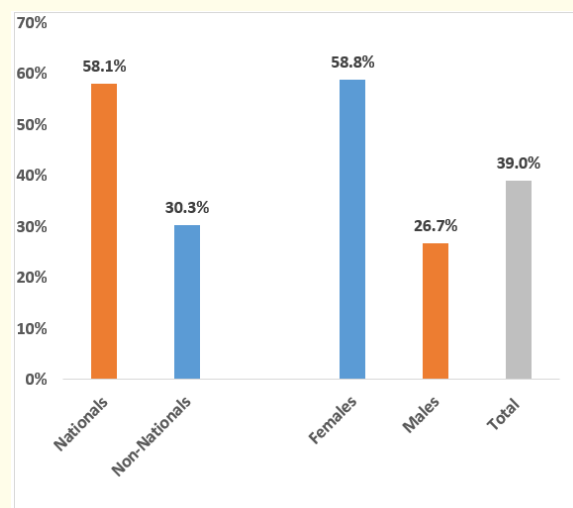
### Results

The mean waist circumference for adult women was 91.2 cm compared to 94.1 cm for men (18+). Moreover, the mean hip circumference was 104 cm for females compared to 100.7 for males.

The proportion of adult men and women with abdominal/ central obesity (waist circumference of  $\geq$ 102cm for men and  $\geq$ 88 cm for women) is illustrated in figure 1. This shows a direct relationship between age and increased central obesity, as 21.2% of the youth surveyed had central obesity and this percentage increased gradually up to 69.1% among the older age group (60+).

**Figure 1:** Distribution of central obesity (waist circumference) among the sampled adults by age groups.

Figure 2 shows the difference in central obesity by gender and nationality. It reveals that almost four in ten of the adults surveyed (39%) have central obesity (as measured by waist circumference). The proportion of men aged 18 and over with a raised waist cir-



**Figure 2:** Distribution of central obesity (waist circumference) among the sampled adults by nationality and gender.

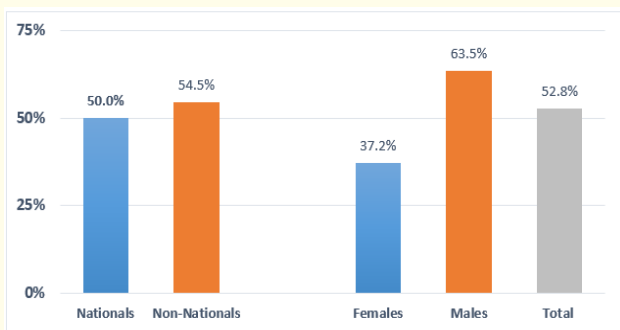
cumference (26.7%) was significantly lower than women (58.8%) were. In addition, Nationals who had a central obesity (58.1%) due to raised waist circumferences were significantly more than non-Nationals (30.3%).

Among the sampled adults, half of them (52.8%) had abdominal obesity (by waist-to-hip ratio). This percentage increases gradually by age starting from 29.7% among the age group 18-24 yrs. up to 80.9% in the eldest age group (figure 3). This raised waist to hip ratio was almost similar in Nationals (50.0%) and non- Nationals (54.5%), however, males were much more likely to have abnormal waist-to-hip ratio than females (63.5% of men compared with 37.2% of women), as shown in figure 4.

The study shows the difference in central obesity by gender and nationality. It reveals that almost four in ten of the adults surveyed (39%) have central obesity (as measured by waist circumference). The proportion of men aged 18 and over with a raised waist circumference (26.7%) was significantly lower than women (58.8%) were. In addition, Nationals who had a central obesity (58.1%) due to raised waist circumferences were significantly more than non-Nationals were (30.3%). Among the sampled adults, half of them (52.8%) had abdominal obesity (by waist-to-hip ratio). This percentage increases gradually by age starting from 29.7% among the age group 18-24 yrs. up to 80.9% in the eldest age group. This raised waist to hip ratio was almost similar in Nationals (50.0%) and non- Nationals (54.5%), however, males were much more likely to have abnormal waist-to-hip ratio than females (63.5% of men compared with 37.2% of women).

The result of current study put in comparison to other studies like, Xi., *et al.* and other studies [19], mainly reported trends in the prevalence of abdominal obesity. Particularly, we report trends in the distribution of WC, which was not reported in other studies. Because Chinese and other Asian populations tend to have a higher risk for obesity-related diseases at a lower criterion, we also report results based on a lower WC standard. The findings are consistent with those of previous studies. Furthermore, our study analyzed the prevalence of abdominal obesity in different regions. The overall prevalence of abdominal obesity in three megacities was consistent with that of nine other provinces and increases the sample representativeness. A previous Chinese study showed that the prevalence in urban populations was close to that in rural populations (27.9% vs. 27.7%) among men, and the prevalence was lower in urban populations compared with rural populations (42.9% vs. 47.1%) among women in 2009 [18]. In this study, the prevalence for women is in accordance with that of the previous study. The highest prevalence rates of obesity in adult populations are estimated to be found in countries located in the Middle East and the Persian Gulf in countries such as Saudi Arabia, the prevalence of obesity is 50.4% among women aged 25 to 64 years (2005) and 31.5% among men. In Mexico, the prevalence of obesity is estimated at 37.5% (2012) among women aged 20 years or older and 26.5% among men, whereas in New Zealand (2013-2014), it is estimated at 30.2% of women and 29.6% of men. In Europe, 2013 data for the United Kingdom indicate a prevalence of obesity among women aged 16 years or older at 28.3% (26% among men) and 2008-2011 data for Germany indicate 23.9% among women and 23.2% among men aged 18 to 79 years [20-26].

**Figure 3:** Distribution of central obesity (waist circumference) among the sampled adults by age groups.



**Figure 4:** Central obesity (waist-to-hip ratio) by nationality and gender among adult participants.

## Discussions

The present study revealed that abdominal obesity is highly prevalent among Dubai adults Cohorts. The mean waist circumference for adult women was 91.2 cm compared to 94.1 cm for men (18+). Moreover, the mean hip circumference was 104 cm for females compared to 100.7 for males. The proportion of adult men and women with abdominal/ central obesity (waist circumference of  $\geq 102$ cm for men and  $\geq 88$  cm for women). This shows a direct relationship between age and increased central obesity, as 21.2% of the youth surveyed had central obesity and this percentage increased gradually up to 69.1% among the older age group (60+).

## Conclusion

Central obesity is a challenging problem among Dubai adult population, about 43% have got abdominal obesity significantly associated with age, gender and nationality.

## Recommendations

Central obesity awareness program needs to be in place at top health system agenda, effective national management protocol will be a priority along with preventive handling.

## Ethical Issues

Standard ethical procedures were applied strictly throughout all stages of research conducting.

## Conflict of Interest

All Authors declared that there are no conflicts of interests.

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