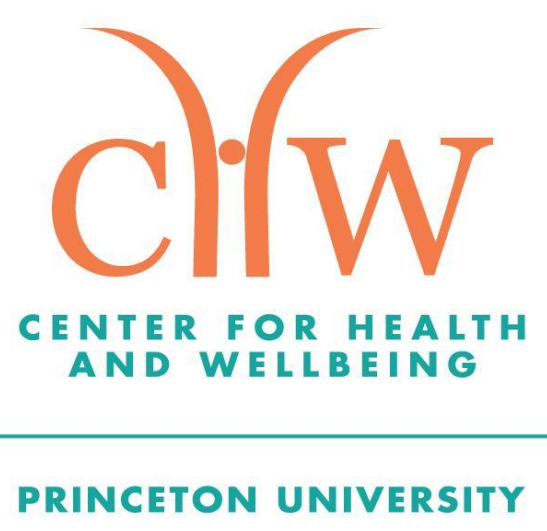




# Relationship between nicotine dependence and fat distribution



Jessica Sheng, 2019, MOL

The Chronic Disease Research Institute, Zhejiang University  
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## Introduction

- The common belief is that smoking leads to weight loss and decreased BMI.
- An increasing number of studies indicate that smoking is a risk factor for central obesity.
- Obesity is a risk factor for type 2 diabetes, cardiovascular disease, and hypertension.
- Data from Asian populations is still deficient.
- The methods for assessing smoking status and measuring fat distribution in existing population-based studies can be improved.
- Most existing studies rely on anthropometric data such as the waist-to-hip ratio.

## Objective of the Study

This study aims to evaluate the association between nicotine dependence and fat distribution among Chinese male adults.



Zhejiang Province, China

## Methods

- 1264 male adults, aged 18-79 years old, were recruited in Lanxi City, Zhejiang Province.
- All the subjects completed a questionnaire on demographics, lifestyle and medical history.
- Nicotine dependence was assessed with the **Fagerström Test for Nicotine Dependence (FTND)**.
- Waist circumference (WC)/hip circumference ratio (WHR) and WC/height ratio (WHtR) were calculated as anthropometric indicators.
- Fat distribution was measured using **dual-energy X-ray absorptiometry (DXA)**.



Photograph of a subject being scanned with the DXA instrument. Credit: Wei Chen, CDRI

Smoking status and fat distribution

	No smoking (517) N (%) or mean (SD)	Low (240) N (%) or mean (SD)	Mid (170) N (%) or mean (SD)	High (77) N (%) or mean (SD)	Former smokers(176) N (%) or mean (SD)	Total (1180) N (%) or mean (SD)	P
BMI	23.76 (2.97)	23.96 (3.11)	23.55 (3.06)	23.17 (2.73)	23.56 (2.86)	23.70 (2.98)	0.262
Height (cm)	167.19 (5.83)	167.90 (5.10)	168.34 (5.13)	168.16 (4.75)	166.72 (5.85)	167.49 (5.55)	<b>0.022</b>
Weight (kg)	66.45 (9.24)	67.58 (9.58)	66.83 (9.78)	65.67 (9.32)	65.65 (9.77)	66.56 (9.48)	0.261
WC (cm)	85.64 (9.12)	86.51 (8.94)	85.88 (9.04)	86.81 (8.03)	85.79 (8.85)	85.95 (8.96)	0.676
Hip-cir (cm)	92.53 (5.29)	92.33 (5.46)	92.00 (5.43)	91.13 (5.04)	91.48 (5.55)	92.16 (5.38)	0.073
WHR	0.924 (0.068)	0.936 (0.062)	0.932 (0.064)	0.952 (0.057)	0.937 (0.062)	0.931 (0.065)	<b>0.003</b>
WHtR	0.513 (0.055)	0.516 (0.054)	0.510 (0.054)	0.516 (0.045)	0.515 (0.051)	0.513 (0.053)	0.858
Body fat percent (%)	23.94 (6.30)	23.77 (6.00)	22.65 (6.67)	22.78 (5.91)	23.60 (5.82)	23.60 (6.21)	0.137
Trunk fat percent (%)	61.67 (5.12)	62.28 (4.56)	61.56 (4.74)	62.84 (4.45)	61.68 (5.03)	61.86 (4.91)	0.163
Android fat percent (%)	11.58 (1.31)	11.81 (1.24)	11.72 (1.20)	12.19 (1.18)	11.62 (1.30)	11.69 (1.28)	<b>0.001</b>
Gynoid fat percent (%)	15.96 (2.96)	15.59 (2.75)	16.08 (2.83)	15.23 (2.44)	15.64 (2.78)	15.81 (2.84)	0.082
AOI	0.758 (0.193)	0.786 (0.176)	0.758 (0.183)	0.826 (0.178)	0.772 (0.179)	0.770 (0.186)	<b>0.021</b>

## Analysis

- Subjects were categorized into three groups: nonsmokers, current smokers and former smokers.
- Current smokers were then further categorized into low (FTND score 0-2), moderate (3-5) and high (6-10) nicotine dependence groups.
- Results were adjusted for age, BMI, education, marital status, physical activity, alcohol use and health conditions (i.e. metabolic diseases).

## Results

- Current smokers with high nicotine dependence were more likely to have **higher WHR, WHtR, trunk fat %, android fat %, and android/gynoid fat ratio (AOI)**, and lower gynoid fat %, than nonsmokers.
- Among current smokers, **WHR and WHtR increased with FTND score**.
- Among older current smokers (age ≥ 60), WHR, WHtR, trunk fat %, android fat % and AOI increased with FTND score, while gynoid fat % decreased.
- Among younger smokers, only WHtR increased with FTND score.

## Conclusion

The belief that smoking can protect against weight gain may be overly simplistic and misleading. Smoking is in fact a risk factor for central obesity.

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