



Risk Factors

Central Adiposity Waist Circumference

Stage 2

Epidemiological Series Report # 2007-23

April 2007

Introduction

The following overview of central adiposity among the participants of the North West Adelaide Health Study discusses the burden of high waist circumference (WC), the prevalence and incidence of high WC, and demographics and chronic conditions associated with a high WC. Stage 1 (baseline examination) of the study was conducted between 2000 and 2003, with Stage 2 (second examination) conducted from 2004 to 2006.

Measurement and definition of central adiposity

Central adiposity, as measured by waist circumference (WC), can be calculated from measurements taken using a standard measuring tape. A high WC is indicative of android obesity, it is advised that no further weight should be gained if the WC is greater than or equal to 95 cm for men or 80cm for women. A waist circumference of ≥ 100 cm for males and ≥ 90 cm for females is the level at which weight reduction is advised^{1,2}.

Incidence of central adiposity (WC)

The incidence of developing high waist circumference from Stage 1 to Stage 2 among those who had normal waist circumference was 30.8 incident cases per 1000 population.

Prevalence of central adiposity (WC) – Stage 1 & Stage 2

The proportion of respondents with a waist circumference at a level at which no further weight should be gained according to clinical assessment in both Stage 1 and Stage 2 is shown in Table 1. Overall, in Stage 1, 58.1% (95% CI 56.6-59.6) of participants had a high WC and in Stage 2 63.9% (95% CI 62.2-65.6) of study participants had a high waist circumference.

Table 1: Prevalence of central adiposity (WC)

	Stage 1		Stage 2	
	n	%	n	%
Normal (WC < 95cm (men) and < 80cm (women))	1699	41.9	1144	36.1
High WC (WC \geq 95cm (men) and \geq 80cm (women))	2359	58.1	2028	63.9
Total	4058	100.0	3173	100.0

* Note: (Stage 1) 2 participants and (Stage 2) 33 participants did not provide measurements and were excluded

Transition to and from central adiposity (WC)

Overall, 11.4% (95% CI 10.4-12.6) of participants went from having a normal WHR in Stage 1 to a high WHR in Stage 2, while 3.9% (95% CI 3.2-4.6) of participants went from having a high WHR in Stage 1 to a normal WHR in Stage 2.

Table 2: The transition to and from central adiposity according to waist circumference

Stage 1	Stage 2	n	%
Normal range	Normal range	1021	32.2
Normal range	High range	326	10.3
High range	High range	1702	53.7
High range	Normal range	123	3.9
Total		3172	100.0

¹ Han T, va Leer E, Seidell J, Lean M. Waist Circumference action levels in the identification of cardiovascular risk factors: prevalence study in a random sample. BMJ 1995; 31:1401-5

² Lean M, Han T, Morrison C: Waist circumference as a measure for indicating need for weight management. BMJ 1995; 311:158-61

The prevalence of high waist circumference in Stage 1 was 58.1%, which increased to 63.9% in Stage 2.

Overall, 10.3% of participants had a normal WC in Stage 1 which increased to a high WC in Stage 2.

Those with a high WC were more likely to be:

- Female;
- aged over 25 years
- adults living without children or a sole parent;
- widowed; or
- working part time, home duties or retired.

Demographic profile of people with high central adiposity (WC)

The prevalence of central adiposity as measured by high waist circumference was statistically significantly higher among females, those aged 25 years and over, adults living alone, or with a partner but not with children, or sole parents, those widowed or those who worked part time/casually, were retired or undertaking home duties. The prevalence of high waist circumference was significantly lower among students, those with a bachelor degree or higher, those with a trade, apprenticeship, certificate or diploma, those earning above \$40,001 per annum, or those who had never been married (Table 3).

Table 3: Univariate Odds Ratios for demographic variables associated with high WC

Variable	n	%	OR	(95% CI)	p value
Sex					
Male	961/1564	61.5	1.00		
Female	1067/1609	66.3	1.23	(1.07- 1.43)	0.005
Age group					
20 to 24 years	51/221	22.9	1.00		
25 to 34 years	333/674	49.4	3.28	(2.32-4.65)	<0.001
35 to 44 years	385/646	59.6	4.95	(3.48-7.02)	<0.001
45 to 54 years	409/562	72.8	9.01	(6.26-12.97)	<0.001
55 to 64 years	341/433	78.8	12.45	(8.44-18.38)	<0.001
65 to 74 years	266/325	82.0	15.26	(10.00-23.28)	<0.001
75 years and over	243/312	78.0	11.90	(7.88-17.97)	<0.001
Highest education level obtained*					
Secondary	1004/1409	71.2	1.00		
Trade/apprenticeship/cert/diploma	747/1158	64.5	0.73	(0.62-0.87)	<0.001
Bachelor degree or higher	237/538	44.0	0.32	(0.26-0.39)	<0.001
Gross annual household income*					
Up to \$20,000	430/597	72.0	1.00		
\$20,001- \$40,000	498/717	69.5	0.89	(0.70-1.13)	0.32
\$40,001- \$60,000	416/682	61.0	0.61	(0.48-0.77)	<0.001
More than \$60,000	578/1032	56.0	0.50	(0.40-0.61)	<0.001
Family structure*					
Family & children, 2 biological/adoptive parents	706/1183	59.7	1.00		
Adult living with partner, no children	584/839	69.6	1.55	(1.28-1.87)	<0.001
Adult living alone	293/426	68.6	1.48	(1.17-1.87)	0.001
Adults – related/unrelated, living together	185/335	55.3	0.84	(0.65-1.07)	0.15
Step/sole/shared parenting & other	220/331	66.6	1.35	(1.04-1.74)	0.02
Marital status*					
Married or living with partner	1431/2107	67.9	1.00		
Separated/divorced	185/271	68.2	1.02	(0.77-1.33)	0.91
Widowed	173/210	82.2	2.18	(1.51-3.14)	<0.001
Never married	221/557	39.6	0.31	(0.26-0.38)	<0.001
Work status*					
Full time employed	815/1416	57.5	1.00		
Part time/casual employed	336/527	63.8	1.30	(1.06-1.60)	0.01
Unemployed	43/75	58.0	1.02	(0.64-1.63)	0.94
Home duties/retired	747/976	76.5	2.40	(2.00-2.88)	<0.001
Student/other	65/149	43.8	0.58	(0.41-0.81)	0.001

*Not stated category not reported

High waist circumference was statistically significantly more likely among those who had diabetes, cardiovascular disease, arthritis or a mental health condition.

Chronic condition profile of central adiposity (WC)

A high waist circumference was statistically significantly more likely among those who had diabetes, cardiovascular disease, arthritis or a self reported mental health condition compared to those without these conditions (Table 4).

Table 4: Univariate Odds Ratios for chronic conditions associated with high WC

Variable	n	%	OR	(95% CI)	p value
Diabetes*					
No	1820/2924	62.2	1.00		
Yes	194/226	85.9	3.69	(2.52-5.41)	<0.001
Asthma*					
No	1678/2655	63.2	1.00		
Yes	349/517	67.5	1.21	(0.99-1.48)	0.06
COPD*					
No	1881/2969	63.4	1.00		
Yes	105/149	70.8	1.40	(0.98-2.01)	0.07
Cardiovascular Disease*					
No	1836/2926	62.8	1.00		
Yes	167/203	82.2	2.75	(1.90-3.97)	<0.001
Arthritis*					
No	1462/2464	59.3	1.00		
Yes	533/653	81.7	3.06	(2.47-3.79)	<0.001
Mental Health Condition*					
No	1647/2647	62.2	1.00		
Yes	355/481	73.7	1.70	(1.37-2.11)	<0.001

* Don't know/ refused/ not stated category not reported

Quality of Life profile of central adiposity (WC)

Figure 1 shows the mean scores of the SF-36 subscales for people with normal or high waist circumference. People who had a high waist circumference scored statistically significantly lower on the Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning and Role Emotional dimensions of the SF-36, when compared to those with normal waist circumference.

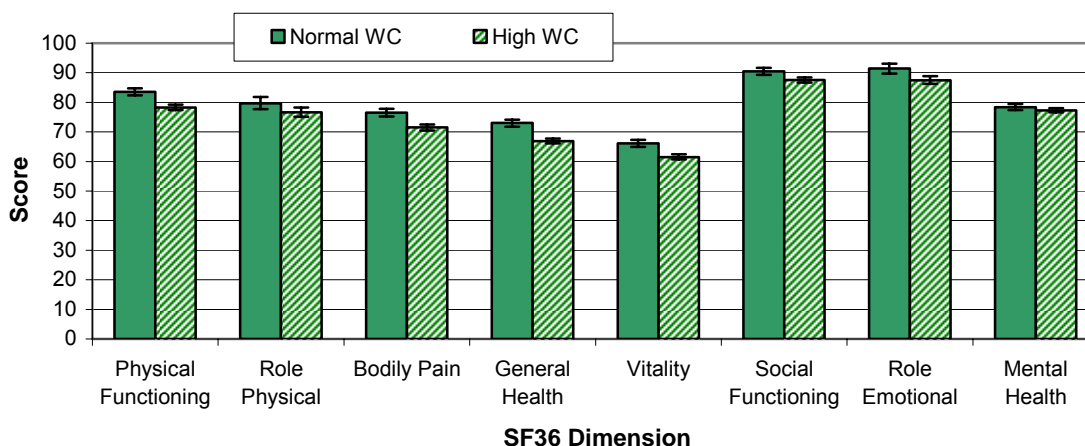


Figure 1: SF-36 mean scores for Normal and High WC

This document is one of a series of reports concerning Stage 2 of the North West Adelaide Health Study. Please see the website for other reports in the series - www.health.sa.gov.au/pros/

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People with a high waist circumference have significantly lower quality of life scores for the Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning and Role Emotional dimensions of the SF-36.