TITLE

Obesity and its association with sociodemographic factors, health behaviours, and health status among Aboriginal and non-Aboriginal adults in New South Wales, Australia

RUNNING TITLE

Obesity among Aboriginal and non-Aboriginal adults

AUTHORS

Katherine Thurber1, Grace Joshy1, Rosemary Korda1, Sandra Eades2, Vicki Wade3, Hilary Bambrick4, Bette Liu5, Emily Banks1,6

AFFILIATIONS

1. National Centre for Epidemiology and Population Health, Research School of Population Health, The Australian National University, Canberra, ACT, Australia
2. Baker IDI Heart and Diabetes Institute, Melbourne, VIC, Australia
3. Djurupin Health in Our Hands
4. School of Public Health and Social Work, Queensland University of Technology, Brisbane QLD, Australia
5. School of Public Health and Community Medicine, UNSW, Sydney NSW, Australia
6. The Sax Institute, Sydney, Australia

CORRESPONDING AUTHOR:

Mailing address: Katherine Thurber, 62 Mills Road, Acton, ACT 2601, Australia
Telephone: +61 2 6125 5615
Fax: +61 2 6125 0740
E-mail address: Katherine.thurber@anu.edu.au
SUPPORTING INFORMATION FILE 1

Socio-demographic variables included: sex; age (categorised as 45-64 versus 65 years and older, and when used for adjustment, in 5-year increments up to age <80, and ≥80 years); annual household income before tax (<$20000, $20000-$39999, $40000-$69999 or ≥$70000); highest qualification (no school certificate, school certificate, trade/apprenticeship/certificate/diploma, or university degree); and employment status (employed or not employed). Remoteness was categorised as major city, regional area or remote area, based on the postcode’s mean Accessibility Remoteness Index of Australia Plus score.¹ Area-level disadvantage was measured using the 2006 Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage,² collapsed into study population tertiles: most disadvantaged (SEIFA values 639-970), middle disadvantage (971-1013) and least disadvantaged (1014-1149).

Health behaviour variables included: smoking status (ex-, current, or never-smoker); average daily fruit and average daily vegetable consumption (<2 or ≥2 and <5 or ≥5 servings respectively³); and alcohol consumption (0, 1-14 or ≥14 drinks per week). The average number of sessions of physical activity longer than 10 minutes,⁴ weighted by activity vigorousness, was categorised as <7, 7-14 or ≥14 sessions per week. Total daily screen-time was categorised as 0-3, 3-5 or ≥5 hours per day, and standing time as 0-3, 3-6 or ≥6 hours per day, based on responses to the question ‘About how many hours in each 24 h day do you usually spend doing the following: watching television or using a computer; sitting; sleeping; standing?’⁷

Health status: Participants were defined as having prior serious illness if they self-reported a doctor diagnosis of heart disease, stroke or diabetes. Self-rated health was categorised as excellent/very good, good or fair/poor. Level of psychological distress was based on participants’ Kessler Psychological Distress (K-10) score,⁵-⁷ categorised as low (<16), moderate (16-22), high (22-30) or very high (≥30). Functional limitation was based on the physical functioning subscale of the Medical
Outcomes Score, participants were categorised as having no limitation (scores of 100), minor/moderate limitation (75-<100) or moderate/severe limitation (<75). Participants were defined as having a disability if they reported needing assistance with daily tasks because of long-term illness or disability. Participants were categorised as full-time carers (caring for a sick or disabled person 20+ hours per week), part-time carers (<20 hours per week) or non-carers (0 hours).
Given the potential link between functional limitation and ability to be physically active, we conducted additional analyses excluding participants with disability or functional limitation for the calculation of obesity PRs by physical activity, screen-time and standing time (Figure S1). After excluding participants with disability or functional limitation, the relationship of BMI to physical activity, screen-time and standing time within the Aboriginal and non-Aboriginal samples did not materially change, and the interactions for physical activity and screen-time were no longer significant (p-value for interaction=0.08, 0.26); the p-value for interaction for standing time remained non-significant (0.75). This demonstrates the importance of considering obesity risk and preventive factors within the context of people’s capabilities.
Figure S1: Obesity prevalence and prevalence ratios among Aboriginal and non-Aboriginal participants according to physical activity, screen-time and standing time, excluding participants with disability or functional limitation

| Physical activity | % Obese (total n) | Prevalence Ratio (95% CI) | % Obese (total n) | Prevalence Ratio (95% CI) | P (int) |
|-------------------|-------------------|---------------------------|-------------------|---------------------------|---------|
| Total             | 33.5 (1064)       | 19.6 (176400)             |
| Physical activity |                   |                           |                   |                           |         |
| <7 sessions/wk    | 38.0 (324)        | 1.00                      | 25.7 (47335)      | 1.00                      | 0.08    |
| 7–14 sessions/wk  | 33.1 (341)        | 0.87 (0.71,1.07)          | 18.7 (66404)      | 0.73 (0.72,0.75)          |         |
| ≥14 sessions/wk   | 29.7 (354)        | 0.79 (0.64,0.98)          | 15.5 (58689)      | 0.60 (0.58,0.61)          |         |
| Screen-time       |                   |                           |                   |                           |         |
| ≥5 hours/day      | 34.5 (342)        | 1.00                      | 23.0 (53525)      | 1.00                      | 0.26    |
| 3–5 hours/day     | 33.9 (404)        | 0.98 (0.80,1.19)          | 19.7 (71975)      | 0.89 (0.87,0.91)          |         |
| ≤3 hours/day      | 29.1 (254)        | 0.82 (0.64,1.04)          | 15.3 (44958)      | 0.68 (0.66,0.70)          |         |
| Standing time     |                   |                           |                   |                           |         |
| ≤3 hours/day      | 37.3 (279)        | 1.00                      | 20.6 (48651)      | 1.00                      | 0.75    |
| 3–6 hours/day     | 34.5 (261)        | 0.94 (0.75,1.18)          | 20.4 (47096)      | 0.99 (0.97,1.01)          |         |
| ≥6 hours/day      | 30.2 (377)        | 0.81 (0.69,1.01)          | 18.2 (62342)      | 0.87 (0.85,0.89)          |         |

Participants were excluded if they reported major disability (needing assistance with daily tasks because of long-term illness or disability) or moderate/severe functional limitation (<75 on the physical functioning subscale of the Medical Outcomes Score); 451 Aboriginal participants (50.1% obese) and 36,901 non-Aboriginal participants (35.3% obese) were excluded from these analyses. Prevalence Ratios are adjusted for age (in 5-year increments up to age <80, and ≥80 years) and sex.

*Significant trend across categories among Aboriginal participants.
† Significant trend across categories among non-Aboriginal participants.
References

1. Australian Institute of Health and Welfare. Rural, regional and remote health: a guide to remoteness classifications. AIHW Catalogue PHE no. 53. Canberra: AIHW, 2004.
2. Pink B. Socio-Economic Indexes for Areas (SEIFA) - Technical Paper. ABS Catalogue no. 2039.0.55.001. Canberra, Australia: Australian Bureau of Statistics, 2006.
3. Australian Government Department of Health and Ageing, National Health and Medical Research Council. Food for health: Dietary guidelines for Australians - A guide to healthy eating. Canberra, 2005.
4. Banks E, Jorm L, Rogers K, et al. Screen-time, obesity, ageing and disability: findings from 91 266 participants in the 45 and Up Study. Public health nutrition 2011;14(01):34-43.
5. Byles JE, Gallienne L, Blyth FM, et al. Relationship of age and gender to the prevalence and correlates of psychological distress in later life. International Psychogeriatrics 2012;24(06):1009-18.
6. Gubhaju L, McNamara BJ, Banks E, et al. The overall health and risk factor profile of Australian Aboriginal and Torres Strait Islander participants from the 45 and Up Study. BMC public health 2013;13(1):661.
7. McNamara BJ, Banks E, Gubhaju L, et al. Measuring psychological distress in older Aboriginal and Torres Strait Islanders Australians: a comparison of the K-10 and K-5. Australian and New Zealand journal of public health 2014.
8. Stewart A, Kamberg CJ. Physical functioning measures. In: Stewart A, Ware JE, eds. Measuring functioning and well-being: the Medical Outcomes Study approach. Durham, North Carolina: Duke University Press 1992.