ORIGINAL RESEARCH ARTICLE

COACTION PUBLISHING

Association between socioeconomic status and overweight and obesity among Inuit adults: International Polar Year Inuit Health Survey, 2007–2008

Natalia Zienczuk and Grace M. Egeland*

School of Dietetics and Human Nutrition and Centre for Indigenous Peoples' Nutrition and Environment (CINE), McGill University, St. Anne de Bellevue, Quebec, Canada

Objectives. To evaluate the socio-economic correlates of overweight and obesity among Inuit undergoing rapid cultural changes.
Study design. A cross-sectional health survey of 2,592 Inuit adults from 36 communities in the Canadian Arctic.
Methods. Main outcome measures were overweight and obesity (BMI >25 kg/m^2 and >30 kg/m^2, respectively) and as characteristics were similar, groups were combined into an at-risk BMI category (BMI >25 kg/m^2). Logistic regression was used to determine the association between various socio-demographic characteristics and physical activity with overweight and obesity.
Results. The prevalence of overweight and obesity was 28 and 36%, respectively, with a total prevalence of overweight and obesity of 64%. In analyses of sociodemographic variables adjusted for age, gender and region, higher education, any employment, personal income, and private housing were all significantly positively correlated with an at-risk BMI ($p \leq 0.001$). Smoking, Inuit language as primary language spoken at home, and walking were inversely associated with overweight and obesity.
Conclusions. The current findings highlight the social disparities in overweight and obesity prevalence in an ethnically distinct population undergoing rapid cultural changes.

Keywords: *obesity*; *socioeconomic status*; *Inuit*

Received: 25 October 2011; Revised: 13 February 2012; Accepted: 2 March 2012; Published: 4 May 2012

Indigenous Peoples are particularly at risk for obesity and the Arctic is no exception (1). Over the past half century, Inuit have undergone social and health transitions resulting in an increase in the prevalence of obesity and co-morbidities such as insulin resistance and cardiovascular disease risk factors (2–6). Studies on Inuit anthropometry conducted between 1990 and 2000 found that Inuit men ranked in the upper half of 76 countries while Inuit women ranked in the top quintile of 115 countries (7). Studies conducted in the 1990s, indicated that Inuit BMIs fell in similar ranges as those from populations from developed countries. Thus, despite the fact that Inuit have historically been free of Western diseases, using BMI as an indicator of obesity reveals that this condition is just as prevalent among Inuit as in Western societies, especially among Inuit women (8).

However, there is a lack of epidemiological data outlining explanatory variables for prevalence of overweight and obesity among Inuit, especially regarding geography, culture, socioeconomic status, and the dynamics of social change. Such studies are important for providing a context for understanding potential contributing factors important for development of health promotion programs.

Methods

Study population and location

Details of the study population and methodology have been presented elsewhere (5). The study population consists of Inuit adults aged 18 years or older in 33 coastal communities and in 3 non-coastal communities representing all communities in 3 regions of northern

Citation: Int J Circumpolar Health 2012, **71**: 18419 - http://dx.doi.org/10.3402/ijch.v71i0.18419

Canada: Nunavut, Nunatsiavut, and the Inuvialuit Settlement Region of the Northwest Territories (Fig. 1). Homes were randomly selected and Inuit adults were invited to participate. Pregnant women were not eligible to participate. Consent forms and all questionnaires were in Inuit languages and dialects and English. The study was developed in a participatory approach and McGill Faculty of Medicine Institutional Review Board issued a certificate of Ethical Acceptability. Informed consent was obtained from each participant.

Questionnaires

All questionnaires were interviewer-administered and involved questions related to general health, smoking, and socio-demographic information. The International Physical Activity Questionnaire (IPAQ) short form was used to assess participants' physical activity during the previous 7 days on the frequency (day/week), duration (min or hrs/day), and intensity (walking, moderate, or vigorous) of physical activity. Questionnaires assessed household crowding, living conditions, and access to traditional food.

Physical measurements

Nurses measured weight and height and BMI was calculated (kg/m^2). Waist circumference (WC) measurements were made at the midpoint between the top of the hip and the last loose rib following the end of a normal expiration for the purpose of determining the extent of abdominal obesity. Percent body fat was determined by bioelectrical impedance using a foot-to-foot Tanita scale (Tanita Corporation Tokyo, Japan). Participants were asked to remove shoes and socks and clothing weight (0.4 kg for all participants), gender, age, and height were entered prior to standing on the platform.

Coding of variables

Education was dichotomized into any elementary education and secondary education or more (which included any number of years of secondary education up to and including post-secondary education). Income was

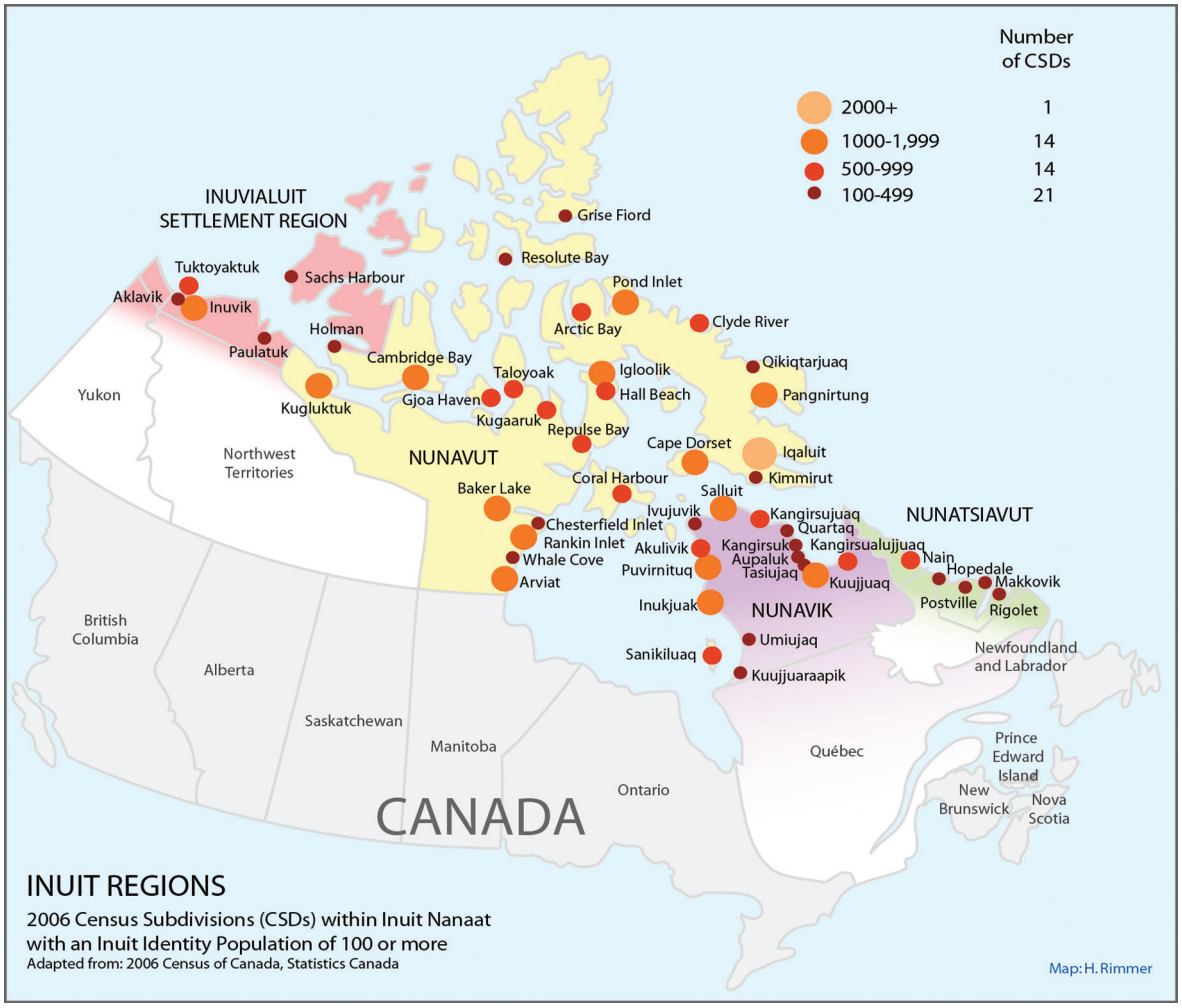

Fig. 1. Map of Inuit regions in Canada.

Citation: Int J Circumpolar Health 2012, **71**: 18419 - http://dx.doi.org/10.3402/ijch.v71i0.18419

presented as 3 categories: <$20,000 per annum, $20,000–60,000, and >$60,000. Housing was dichotomized into private and public housing where public housing refers to homes that are provided by the government. Marital status was dichotomized into married (which included common law) versus single (including separated, divorced, and widowed). Smoking was presented as 3 categories: never, former, and current smoker. Walking was based on calculated MET scores using an energy requirement of 3.3 and the continuous variable was divided into tertiles for analyses. Classification of overweight and obesity was based on established body-mass index categories (BMI): obesity was defined as BMI $\geq$30, overweight as BMI $\geq$25 and <30 (9). Overweight and obese categories were combined into one at-risk BMI group (>25 kg/m^2) given that the sociodemographic characteristics were similar between the 2 groups. An at-risk waist circumference (WC) was defined using WC cut-off values indicative of increased risk of obesity-related health consequences: $\geq$102 cm for men and $\geq$88 cm for women (9). An at-risk % body fat (BF) indicative of obesity was defined as >25% in men and >35% in women (9).

Statistical analyses

Pearson chi-square compared frequencies of overweight and obesity by categories of sociodemographic characteristics. Logistic regression analyses were conducted to evaluate the important variables that were significantly in the bivariate analyses. Overweight/obesity combined was the dependent variable and each potential risk factor was evaluated as a categorical independent variable. The 3 regions were Nunavut, Nunatsiavut Region, and the Inuvialuit Settlement Region. Walking was entered as tertile groupings of total MET (metabolic equivalent) scores calculated using the energy requirement of 3.3 for walking, as per the Compendium of Physical Activities (10). Statistical software package STATA version 10.0 was used for all statistical analyses. Level of statistical significance was $p < 0.05$.

Results

A total of 2,796 households were approached of which 1,901 (68%) agreed to participate with a total of 2,595 participants of whom 998 were male and 1,597 were female. There were 1,923 participants from Nunavut, 363 participants from Inuvialuit, and 310 participants from Nunatsiavut (Table I). The mean age was 41.7 (SD = 14.8). BMI ranged from 16.2 to 62.6 with a mean of 28.4 (SD = 6.53). Both men and women had a mean BMI value that fell into the overweight category based on WHO BMI cut-offs: 27.2 (SD = 5.50) for men and 29.1 (SD = 6.99) for women. The mean WC and %BF was 93.2 cm (SD = 16.2) and 30.4% (SD = 11.1), respectively. Among women, the mean WC was 93.8 cm (SD = 16.6) while men had a mean WC of 92.3 cm (SD = 15.4). This places the mean WC value for Inuit women above the 88 cm WHO WC cut-off indicative of increased risk of obesity-related health consequences while the mean WC for men was below the WHO WC cut-off of 102 cm. In terms of %BF, men were once again below the 25% WHO cut-off for %BF indicative of obesity with a mean of 23.2% (SD = 9.02). The mean %BF among women, however, was 34.9% (SD = 9.91): just below the 35% WHO cut-off for %BF. The characteristics associated with overweight and obesity were similar when evaluating at-risk WC and %BF, thus data are only presented based upon BMI groupings.

Prevalence of overweight and obesity

In unadjusted analyses, overweight and obesity increased with advancing age (chi-square test for trend $p \leq 0.05$; OR = 1.50; 95% CI: 1.35, 1.67), and women had a higher prevalence of obesity than men (42 and 27%, respectively) while men had a higher prevalence of overweight than women (40 and 34%, respectively) (Table I). Nunatsiavut had the highest percentage of overweight (34%), while the highest prevalence of obesity was observed in the ISR (49%), followed by Nunatsiavut (41%) and Nunavut (33%). The ISR had the highest overall prevalence of overweight and obesity combined (76%). Prevalence of overweight and obesity was higher among those who were employed, had higher incomes and lived in private housing ($p = 0.013$; $p < 0.001$; $p < 0.001$). But, no significant difference in overweight and obesity prevalence was observed with increased education in unadjusted analyses. On the other hand, we observed a trend of decreasing obesity prevalence with increasing tertile category of walking (43, 36, and 29% in high, medium, and low tertiles of walking; $p < 0.001$; chi-square test for trend $p < 0.01$). Further, using primary language spoken at home as a proxy for level of acculturation, it was found that the prevalence of overweight and obesity was higher among those who spoke only English (73%), and both Inuit and English languages at home (71%) compared to those who spoke only an Inuit language in the home (59%), Ps < 0.001). In addition, a lower prevalence of overweight and obesity was observed among smokers compared to non-smokers and a higher prevalence of obesity was observed among former smokers compared to those who never smoked ($p < 0.001$).

Sociodemographic and lifestyle variables associated with overweight and obesity

Due to the similarities in the patterning of overweight and obesity in unadjusted analyses, the overweight and obese categories were combined to form an at-risk BMI ($\geq$25 kg/m^2) variable for further analyses. In analyses of sociodemographic variables, adjusted for age, gender, and region, higher education, employment, personal income, and private housing were all significantly positively

Table I. Percentage of Inuit adults with an at-risk body mass index (BMI), waist circumference (WC), and % body fat (BF) by sociodemographic characteristics: International Polar Year Inuit Health Survey, 2007–2008

	n = 2595	% Normal weight (BMI < 25 kg/m^2)	% Overweight (BMI ≥ 25 to < 30 kg/m^2)	% Obese (BMI ≥ 30 kg/m^2)	p
Age					
18–25	330	53	23	25	< 0.001
26–35	496	40	27	33	
36–65	1182	31	29	39	
> 65	170	26	33	41	
Gender					
Male	837	40	33	27	< 0.001
Female	1341	34	25	42	
Region					
Nunavut	1654	40	27	33	< 0.001
Inuvialuit	264	24	27	49	
Nunatsiavut	260	25	34	41	
Smoking					
Never	116	22	33	46	< 0.001
Former	522	15	30	55	
Current	1511	45	26	29	
Education[a]					
Elementary	559	36	27	36	0.927
Secondary+	1565	37	28	36	
Employment					
Yes	1319	34	28	38	0.013
No	770	40	27	33	
Income					
< 20,000	1017	45	26	29	< 0.001
20,000–60,000	643	30	29	42	
≥ 60,000	257	18	30	52	
Marital status					
Single	527	52	22	26	< 0.001
Married/C.L	1382	31	30	39	
Divorced/separated/widow	243	33	27	40	
Housing					
Private	443	21	30	49	< 0.001
Public	1000	40	27	34	
Primary language					
Inuit language	653	41	25	34	< 0.001
Inuit and English	196	29	31	40	
English	634	27	29	44	
Walking (tertiles)[b]					
Lowest tertile	665	31	26	43	< 0.001
Mid-tertile	702	37	28	36	
Highest tertile	561	42	29	29	

[a]Secondary education includes any number of years of secondary education and post-secondary education.
[b]Walking tertiles are based upon the calculated continuous MET score for walking obtained using the International Physical Activity Questionnaire (IPAQ) and an energy requirement of 3.3 for walking, as per the Compendium of Physical Activities (10).

Citation: Int J Circumpolar Health 2012, **71**: 18419 - http://dx.doi.org/10.3402/ijch.v71i0.18419

associated with an at-risk BMI ($p < 0.001$) (Table II). Using the lowest income category as the reference category (<$20,000), odds of an at-risk BMI increased with increasing categories of income: OR = 1.82 (95% CI 1.47, 2.27) and 3.66 (95% CI 2.57, 5.21) for those $20,000–60,000, and >$60,000, respectively. It was found that being married was an indicator of increased odds of an at-risk BMI (OR = 1.89; 95% CI 1.56, 2.27; $p < 0.001$). Smoking, Inuit language as primary language spoken at home, and walking were inversely associated with overweight/obesity. Current smokers had decreased odds of overweight/obesity compared to never-smokers with an OR of 0.39 (95% CI 0.25, 0.62; $p < 0.001$). Using English as the reference category, the odds of an at-risk BMI was 1.09 (95% CI 0.74, 1.59) among those who spoke both Inuit and English versus an OR of 0.63 (95% CI 0.47, 0.84) among those who only spoke an Inuit language at home. For the logistic regression analysis, the 1st tertile was used as the reference category and increased tertile of walking was negatively associated with at-risk BMI (Table II).

Discussion

The current study identified that overweight and obesity is of public health concern in Arctic communities. The prevalence of overweight and obesity was 28 and 36% respectively, and the overall prevalence of an at-risk BMI (≥25 kg/m) was 64%. In comparison, according to the 2004 Canadian Community Health Survey, the prevalence of overweight among adult Canadians (18+) was higher (36%), but the prevalence of obesity (23%) was lower than that observed in our study population (11). Pooled survey data from 4 circumpolar Inuit populations in the 1990's reported the crude prevalence of overweight and obesity to be 52.4% among Inuit men, while 58% of Inuit women were overweight and obese (12). According to our survey data, 60% of Inuit men and 67% of Inuit women were overweight and obese – indicating that previously documented high prevalence rates continue to increase among Inuit (Table I). The prevalence of obesity was higher among women and increased with age, which is a pattern documented in the literature in most population groups (13). No differences in the direction of the relationship between sociodemographic variables and the likelihood of an at-risk BMI were observed by gender, in contrast to the findings of a similar study conducted in Greenland where a positive association between westernization and CVD risk was observed among men while BMI and CVD risk factors decreased with westernization among women (14).

Table II. Adjusted[1] logistic regression odds ratios (OR) and 95% confidence intervals (CI) of demographic variables for predicting an at-risk BMI[2] among Inuit adults: Inuit Health Survey, 2007–2008

		Odds ratio (OR)	95% CI
Marital status	Married or common law	1.89	1.56, 2.27
	Single, separated, divorced, widow	1.00	
Education	Secondary +	1.56	1.23, 1.97
	Elementary	1.00	
Employment	Employed	1.61	1.29, 2.00
	Not employed	1.00	
Personal income	>60,000	3.66	2.57, 5.21
	20,000–60,000	1.82	1.47, 2.27
	<20,000	1.00	
Smoking	Current	0.39	0.25, 0.62
	Former	1.46	0.87, 2.43
	Never	1.00	
Primary Language	Inuit language	0.63	0.47, 0.84
Spoken at home	Inuit and English	1.09	0.74, 1.59
	English	1.00	
Housing	Private	2.04	1.54, 2.69
	Public	1.00	
Physical activity	Tertile 3 of walking METs	0.74	0.58, 0.94
	Tertile 2 of walking METs	0.82	0.65, 1.04
	Tertile 1 of walking METs	1.00	

[1]Adjusted for age, gender, region.
[2]At-risk BMI defined as BMI = 25 kg/m^2.
Note: Walking tertiles are based upon the calculated continuous MET score for walking obtained using the International Physical Activity Questionnaire (IPAQ) and an energy requirement of 3.3 for walking, as per the Compendium of Physical Activities (10).

Given the longer torsos relative to legs or greater sitting height ratios among Inuit, sitting height adjusted overweight and obesity prevalence were evaluated in the current study population attempting a variety of approaches in which a substantial agreement was found between observed and sitting height adjusted overweight and obesity prevalence (15). However, there were methodological problems in that in the current study population sitting height ratios did not significantly relate to body mass index in stark contrast to observations in other study populations. While additional research is needed to explore other aspects of Inuit morphology that may influence the validity of BMI as a measure of adiposity, we believe that any potential modifications in prevalence rates due to differences in Inuit morphology are unlikely to be large enough to minimize concerns regarding the public health importance of overweight and obesity in the Arctic.

Sociodemographic determinants of an at-risk BMI

Higher socioeconomic status (SES) was associated with increased odds of overweight and obesity: a pattern most often observed in low-income developing economies (16). Walking, smoking, and speaking an Inuit language at home were all associated with a lower prevalence of having an at-risk BMI. Specific indictors of SES that were positively correlated with an at-risk BMI included higher education, employment, income, and private housing in age and gender adjusted analyses. Furthermore, a gradient was observed with increasing income where the odds of an at-risk BMI consistently increased with increasing income category.

Although there have been dramatic increases in obesity worldwide due to societal and nutritional factors that have led to modernization and globalization of food markets, the impact of these factors is unequal within societies and is dependent on the stage of socioeconomic development of the society (17). For example, countries with a high level of economic development often have an inverse relationship between obesity and SES, which may be a reflection of diet inequalities between high and low-income groups where the poor can only afford poor quality diets low in fruits and vegetables and high in energy dense foods (11). However, the reverse is true for low income developing economies and Indigenous populations in developed countries – where obesity is associated with higher SES (16). The modernization of societies and globalization has led to a nutrition transition that is especially noticed in societies in developmental transition, such as among Indigenous populations, where especially high rates of obesity have been documented (18,19). The positive association between SES and obesity in developing economies and Indigenous populations may be attributable to higher energy expenditure among those with lower SES and the ability for those with higher SES to afford food and energy-dense food. In the Arctic, the availability of nutrient-dense market food such as fruits and vegetables is limited and expensive while nutrient-poor, energy-dense foods were reported to be consumed 7.6 times per day more frequently than both fruits and vegetables and traditional foods in a study of Inuvialuit communities in the Northwest Territories (20). However, traditional food intake is also largely dependent on financial resources available to purchase hunting equipment, ammunition, and gasoline. Thus, SES can have diverse effects, both positive and negative on diet quality. In a study of 3 communities in the Arctic, a higher MSL (Material Style of Life) score, a proxy for SES, was associated with increased traditional food intake, increased fruit and vegetable intake as well as increased intake of nutrient-poor and energy-dense food (21).

The obesity-SES relationship among Inuit in Canada in comparison to the general Canadian population illustrates the acculturation processes taking place. Using Inuit language as an indicator of adherence to traditions, we see that having an Inuit language primarily spoken at home is associated with a lower prevalence of overweight and obesity. Furthermore, a gradient is observed where odds of an at-risk BMI increase if both an Inuit language and English are spoken at home and even further increase if only English is spoken at home, suggesting that the higher the level of acculturation, the higher the odds are of developing an at-risk BMI. Acculturation involves increasing availability of imported food and a concurrent increase in sedentary jobs, subsequently resulting in a decrease in physical activity. Thus, those with a lower SES may also be protected against obesity as a result of greater physical activity perhaps due to not owning a vehicle, not being able to afford gasoline for the vehicle, not having a sedentary job, and due to spending more time hunting and harvesting food.

Conclusion

Several studies have documented that the burden of obesity tends to fall on those in lower SES groups with increasing development, albeit sex differences have been noted (16). Further comparison of the present findings to those of a recent analysis of obesity among off-reserve Canadian Aboriginals participating in the 2004 Canadian Community Health Survey (CCHS) emphasizes the complexity of the SES-obesity relationship (22). Among off-reserve Aboriginals, employment and household income (among Aboriginal women) were inversely associated with obesity, contrary to the findings of the present study. However, household income (among Aboriginal men) was positively associated with obesity, consistent with the present study. However, the positive association between education and an at-risk BMI in the

Citation: Int J Circumpolar Health 2012, **71**: 18419 - http://dx.doi.org/10.3402/ijch.v71i0.18419

present study is consistent with the findings among off-reserve Aboriginals.

Limitations

The present study was a cross-sectional study of correlates of an at-risk BMI and not predictors of emergence of an at-risk BMI. Further, adjusted odds ratios (OR) tend to overestimate the true relative risk (RR) when outcomes are not rare, as is the case with an at-risk BMI.

Implications of research to practice

Encouragement of walking and other physical activity and finding ways to combat the negative aspects of acculturation on body weight will promote health in Arctic communities.

Acknowledgements

Natalia Zienczuk analyzed the research data, interpreted the findings and wrote the manuscript. Dr. Egeland designed the study and supervised data collection. Dr. Egeland guided the statistical analyses. The authors wish to thank database manager, Dr. Nelofar Sheikh, project manager, Ms. Helga Saudny, and Dr. T. Kue Young for his mentorship.

Conflict of interest and funding

The authors have not received any funding or benefits from industry or elsewhere to conduct this study.

References

1. Swinburn BA, Caterson I, Seidell JC, James WP. Diet, nutrition, and the prevention of excess weight gain and obesity. Public Health Nutr. 2004;7:123–46.
2. Bjerregaard P, Jørgensen ME, Andersen S, Mulvad G, Borch-Johnsen K, Backer V, et al. Decreasing overweight and central fat patterning with Westernization among the Inuit in Greenland and Inuit migrants. Int J Obes Relat Metab Disord. 2002;26:1503–10.
3. Charbonneau-Roberts G, Young TK, Egeland GM. Inuit anthropometry and insulin resistance. Int J Circumpolar Health. 2007;66:129–34.
4. Deutch B, Pedersen HS, Hansen JC. Increasing overweight in Greenland: social, demographic, dietary and other life-style factors. Int J Circumpolar Health. 2005;64:86–98.
5. Egeland GM, Cao Z, Young TK. Hypertriglyceridemic-waist phenotype and glucose intolerance among Canadian Inuit: the International Polar Year Inuit Health Survey for Adults 2007–2008. CMAJ. 2011;183:553–8.
6. Chateau-Degat ML, Dewailly E, Louchini R, Counil E, Noel M, Ferland A, et al. Cardiovascular burden and related risk factors among Nunavik (Quebec) Inuit: Insights from baseline findings in the circumpolar Inuit Health in Transition cohort study. Can J Cardiol. 2010;26:190–6.
7. Young TK, Bjerregaard P, Dewailly E, Risica PM, Jorgensen ME, Ebbesson SE. Prevalence of obesity and its metabolic correlates among the circumpolar Inuit in 3 countries. Am J Public Health. 2007;97:691–5.
8. Young TK. Obesity, central fat patterning, and their metabolic correlates among the Inuit of the Central Canadian Arctic. Hum Biol. 1996;68:245–63.
9. WHO. Obesity: Preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser. 2000;894:i–xii, 1–253.
10. Ainsworth BE, Haskell WL, Whitt MC, Irwin ML, Swartz AM, Strath SJ, et al. Compendium of physical activities: an update of activity codes and MET intensities. Med Sci Sports Exerc. 2000;32(Suppl 9):S498–504.
11. Tjepkema M. Adult obesity. Health Rep. 2006;17:9–25.
12. Young TK. Are the circumpolar Inuit becoming obese? Am J Hum Biol. 2007;19:181–9.
13. Torrance GM, Hooper MD, Reeder BA. Trends in overweight and obesity among adults in Canada (1970–1992): evidence from national surveys using measured height and weight. Int J Obes. 2002;26:797–804.
14. Bjerregaard P, Jorgensen ME, Borch-Johnsen K. Cardiovascular risk amongst migrant and non-migrant Greenland Inuit in a gender perspective. Scand J Public Health. 2007;35:380–6.
15. Galloway T, Chateau-Degat ML, Egeland GM, Young TK. Does sitting height ratio affect estimates of obesity prevalence among Canadian Inuit? Results from the 2007–2008 Inuit Health Survey. Am J Hum Biol. 2011;23:655–63.
16. McLaren L. Socioeconomic status and obesity. Epidemiol Rev. 2007;29:29–48.
17. Monteiro CA, Moura EC, Conde WL, Popkin BM. Socioeconomic status and obesity in adult populations of developing countries: a review. Bull World Health Organ. 2004;82:940–6.
18. Kuhnlein HV, Receveur O, Soueida R, Egeland GM. Arctic Indigenous peoples experience the nutrition transition with changing dietary patterns and obesity. J Nutr. 2004;134:1447–53.
19. Cassels S. Overweight in the Pacific: links between foreign dependence, global food trade, and obesity in the Federated States of Micronesia. Global Health. 2006;2:10.
20. Erber E, Beck L, Hopping BN, Sheehy T, De Roose E, Sharma S. Food patterns and socioeconomic indicators of food consumption amongst Inuvialuit in the Canadian Arctic. J Hum Nutr Diet. 2010;23(Suppl 1):59–66.
21. Mead E, Gittelsohn J, Roache C, Sharma S. Healthy food intentions and higher socioeconomic status are associated with healthier food choices in an Inuit population. J Hum Nutr Diet. 2010;23(Suppl 1):83–91.
22. Ng C, Corey PN, Young TK. Socioeconomic patterns of obesity among Aboriginal and non-Aboriginal Canadians. Can J Public Health. 2011;102:264–8.

***Grace M. Egeland**
School of Dietetics and Human Nutrition and Centre for Indigenous Peoples' Nutrition and Environment (CINE), McGill University
21111 Lakeshore Road
St. Anne de Bellevue, Quebec, H9X 3V9
Canada
Email: grace.egeland@mcgill.ca