

La prévalence de l'excès de poids chez les femmes et les hommes adultes vivant sur les réserves de la Colombie Britannique, Canada

[The prevalence of excess weight in adult First Nations women and men living on the reserves of British Columbia, Canada]

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ABSTRACT: *Objective:* To describe the prevalence of excess weight (EW) in the context of First Nations (FN) living on the reserves of British Columbia (BC).

Design: A cross sectional survey conducted in the frame of my PhD theses, on data collected in 2008 and 2009 through a research study named "First Nations Food, Nutrition and Environment Study" (FNFNES) aiming to document the nutritional status and exposure to contaminants in Canadian First Nations communities living south of the 60th parallel. The survey included anthropometric data, dietetic and sociodemographic and lifestyle data.

Subjects and settings: Three levels random sampling: province, communities and households. 493 women and 356 men aged 19 years and over were randomly selected from households in 20 communities.

Statistical analysis: For data analysis, the statistical analysis software (SAS 9.1) was used.

Results: Among women (n = 493) and men (n = 356) respectively, the prevalences were 44.8% and 35.4% for obesity, and 31.6% and 41.3% for overweight, that is a total of 76.4% and 76.7% of excess weight.

Conclusions and applications: This study suggests that the prevalence of excess weight is very high in both adults women and men, which shows a real public health problem in First Nations living on the reserves of British Columbia. Policies aiming reduction of excess weight should be initiated in order to prevent the health and socioeconomic consequences of overweight on that population.

KEYWORDS: excess weight, overweight, obesity, First Nations, British Columbia, Canada.

RESUMÉ: *Objectif:* décrire la prévalence de l'excès de poids chez les Premières Nations vivant sur les réserves de la Colombie Britannique, au Canada

Cadre de l'étude: Une étude transversale a été conduite sur des données collectées à travers un projet de recherche dénommé "First Nations Food, Nutrition and Environment Study" (FNFNES) et visant à documenter les le statut nutritionnel et l'exposition aux contaminants des Premières Nations vivant en dessous du 60^{ème} parallèle. Des données anthropométriques, diététiques, socioculturelles et du mode de vie avaient été collectées.

Échantillonnage et analyses statistiques: Un échantillonnage à trois degrés, provincial, communautaire et des ménages. 493 femmes et 356 hommes avaient été sélectionnés pour participer à l'étude.

Les données ont été analysées avec le logiciel SAS 9.1 (Statistical Analysis Software)

Résultats: Respectivement pour les femmes et les hommes, les prévalences étaient de 44.8% et 35.4% pour l'obésité, de 31,6% et 41,3% pour l'embonpoint, soit de 76,4 et 76,7 pour l'excès de poids.

Conclusions et recommandations: L'étude a trouvé de fortes prévalences de l'excès de poids aussi bien chez les femmes que chez les hommes, un réel problème de santé publique dans le contexte de l'étude. Des politiques visant à prévenir et à réduire l'excès de poids seraient nécessaires pour cette population afin de prévenir les conséquences de l'excès de poids sur les plans sanitaire et économique.

MOTS-CLEFS: excès de poids, embonpoint, obésité, Premières Nations, Colombie Britannique, Canada.

1 INTRODUCTION

The term « Excess weight » (EW) refers to overweight or pre-obesity [1] and to obesity, the first being a pathway to the latter. It's an excessive accumulation of fat due to a long term energy misbalance[2, 3].

Excess weight is a multifactorial condition involving biological, genetic, cultural and environmental factors [4,5,6,7]. Consequences of higher prevalence of overweight and obesity are 1) medical through high morbidity and mortality (cardiovascular diseases, hypertension, diabetes, dyslipidemia, cancer etc. [8,9], 2) economic (high direct costs of management co-morbidities by health services, loss of productivity, absenteeism and premature death [7,10] and 3) psychosocial (anxiety, depression, low self-esteem)[11,12].

There is consistent evidence showing that the prevalence of excess weight is increasing all over the world [1]. In Canada, the prevalence is 59.1%, of which 23.1% can be ascribed to obesity and 36.0% to overweight [13]. According to some isolated studies, these proportions are higher in Canadian aboriginal populations [14,15] which could justify the present study.

Canadian Aboriginal group comprises FN, Inuit and Metis communities [16,17]. Although many of them have moved to urban areas for better life conditions such as education, employment and health care, a large majority is still living on the reserves[18]. As compared to other Canadians, the Aboriginal people encounter among other problems, lower life quality and lower life expectancy [16], more mental and physical diseases, higher risk of cardiovascular diseases [19], more excess weight and diabetes[20]. For this reason, the World Health Organization [21] has recommended to search for new strategies aiming to a better understanding of the health determinants in the aboriginal populations. Earlier, Receveur et al. [22] called for new initiatives in order to document the health status of Aboriginal populations and to prevent negative health consequences.

In BC, no regional study has been carried out to date regarding FN nutrition. However, isolated studies conducted in some communities evoked a higher prevalence of obesity in aboriginal populations than in the general Canadian population[23,14] and higher morbidity and mortality related to overweight and obesity[24,25]. This study aimed to describe the phenomena of excess weight among adult First Nations, aged 19 years and over, living on the reserves of BC.

2 METHODS

A cross sectional survey conducted in the frame of the author's PhD theses (University of Montreal, 2013), on data collected in 2008 and 2009 through a research study named "First Nations Food, Nutrition and Environment Study" (FNFNES), aiming to document the nutritional status and exposure to contaminants in Canadian First Nations communities living south of the 60th parallel. The survey included anthropometric data, dietetic and sociodemographic and lifestyle data. This study focuses only on the BC region, especially on the FN group, which is the largest of the aboriginal population groups living on the reserves of BC [26].

2.1 SAMPLING

Due to budget constraints and the large geographic distribution of the population, a three level random sampling approach was used [27]; 21 communities were selected out of 198 FN communities in BC. From the housing lists of the selected communities 100 households were selected and in each household, one adult person, woman or man, was selected as a representative. The initial sample was 1103 participants of which 705 were women and 390 were men.

2.2 DATA COLLECTION TOOLS

Data were collected on three main variables: excess weight, diet quality and sociodemographic and lifestyle components. This choice was based on previous studies carried out in the Canadian Arctic by Kuhnlein et al. [14].

In order to calculate the body mass index (BMI), expressed as a ratio weight (in kg) /height² (in meters) [1], height was measured without shoes, using a stadiometer (precision 0.5cm). For weight, a scale (precision = 100gr) was used and participants were measured in light clothing, without shoes. When participants did not accept to be measured, self-reported data of height and weight were used to calculate BMI [14,28].

2.3 VARIABLES AND INDICATORS

Excess weight was estimated by the body mass index (BMI), as well as for the sub-variables, overweight or obesity[2,3]. Participants were defined as normal, overweight or obese respectively, when BMI was between 18.5 and 24.9, 25.0 and 29.9, and 30.0 and over, respectively, as shown in table 1 here below.

Table 1. Description of the study variable

Variable	Sub-variables	Tresholds
Excess weight (BMI) (WHO, 2003)	Normal	18.5 ≤ BMI ≤ 24.9
	Overweight	25.0 ≤ BMI ≤ 29.9
	Obese	BMI ≥ 30.0

2.4 STATISTICAL METHODS

The collected data were encoded using Epi-info software, version 3.4.3. For data analysis, we used the Statistical Analysis Software (SAS), version 9.1.

2.5 DATA ANALYSIS

All analyses were stratified by gender as evidence shows that women and men report differently their BMI[29,13] and their feeding habits[30,31].

All participants missing one or more anthropometric data (weight or height) or had a BMI less than 18.5 were excluded along with pregnant and lactating women[14,31]; therefore, only 849 participants – 493 women and 356 men - were included in the final sample. No adjustment was needed for height and weight self-reported data as there was no significant difference between measured and self-reported data[26].

3 RESULTS

Table 2. Description of the study sample

Age (years)	Total (n = 849) n (%)	Women (n = 493) n (%)	Men (n = 356) n (%)
19-30	145 (17.1)	83 (16.8)	62 (17.4)
31-50	426 (50.2)	264 (53.5)	162 (45.5)
51-70	278 (32.7)	146 (29.6)	132 (37.1)
Mean ± ET	44.3±12.9	43.4 ± 12.6	45.1 ± 13.2

Table 2 here above shows the sample characteristics of the population, including numbers of participants, gender and age categories. A total of 849 adults participants joined the study, among which 493 women (58.1%) and 356 men (41.9%).

Overall, the majority of the participants ranged from 31 to 50 years old. In women, mean age was 43.4 (±12.6) years, with 16.8% of respondents ranging from 19 to 30 years old, 53.5% from 31 to 50 years, and 29.6% from 51 to 70 years. In men, the mean age was 45.1 (±13.2) years, with 17.4% of respondents ranging from 19 to 30 years old, 45.5% from 31 to 50 years, and 37.1% from 51 to 70 years.

Table 3. Distribution of excess weight (BMI) among adult women and men

Variable	Sub-variables	Total	Women	Men
		n = 849 n (%)	(n=493) n (%)	(n=356) n (%)
BMI	Normal	199 (23.4)	116 (23.6)	83 (23.3)
	Overweight	303 (35.7)	156 (31.6)	147 (41.3)
	Obesity	347 (40.9)	221 (44.8)	126 (35.4)
	Excess weight (overweight + obesity)	651 (76.6)	377 (76.4)	273 (76.7)
	Mean±ET	29±6.3	30.0±6.7	28.9±5.8

Table 3 shows the distribution of BMI variable and sub-variables among both female and male participants. Overall, the mean BMI was 29±6.3 kg/m²; only few of them had a normal BMI (23.4%) while the majority was of excess weight (76.6%), being either overweight (35.7%) or obese (40.9%).

This trend was also observed within the two genders separately; in women, the mean BMI of the sample was 30.0 (±6.7)kg/m²; only 23.5% had a normal BMI versus 31.6% overweight and 44.8% obese, which is a global prevalence of 76.4% (31.6% + 44.8%) of excess weight. In men, the mean BMI was 28.9 (±5.8); for women, a similar trend was observed: only 23.3% had a normal BMI versus 41.3% overweight and 35.4% obese, that is a global prevalence of 76.7% (41.3% + 35.4%) of excess weight.

Table 4: Prevalence of excess weight in FN women and men versus overall Canadian women and men

Variable	Sub-variables	Prevalence			
		Women		Men	
		First Nations	Canada*	First Nations	Canada*
Excess weight	Overweight	31.6	30.2	41.3	42.2
	Obesity	44.8	23.2	35.4	22.9
	Excess weight	76.4	53.1	76.7	65.4
	Normal	23.6	46.1	23.3	34.6

* From Ford and Mokdad [32]

Table 4 here above confronts the prevalence of excess weight for both adults FN women and men on the reserves of BC with to prevalence data from previous researches aiming the Canadian general population where excess weight was already described as public health problem. It appears that the prevalence of excess weight was higher in FN than in overall Canadian women and men. This was also the case for the sub-variables of excess weight, especially obesity as the proportions were almost doubled in women and more than 12% higher in men.

4 DISCUSSION

This study aimed to describe the importance of excess weight (EW) in FN women and men living on the reserves of BC, in Canada. The results show high prevalences of EW in women (76.4%), including 31.6% of overweight and 44.8% of obesity (Tables 3 and 4). These prevalences are higher than those of 36.0 et 23.1% as observed in general Canadian adult population [13] and of 30.2 et 23.2% in Canadian women [32], for overweight and obesity respectively. They were also higher than in BC general population where Shields and Tjekpema [13] found 39.8% of overweight and 19.2% of obesity. Our results are also close to those from Tremblay et al. [33] who investigated the association between excess weight and ethnicity, based on self-reported data and found 60% of excess weight, including 30% of obesity in FN women living out reserves, which was higher than those observed in all other ethnics of that context. Garriguet [15] had observed the same trend in FN adults living out-reserves in Ontario and in West Provinces, with 29% of overweight and 38% of obesity in adult aged 9 à 50 years. Particularly in women in the same age category and living out reserves, the author found 23% of overweight and 41% of obesity, which is similar to our results identifying more obesity than overweight in FN women living on the reserves of BC.

In men living on the reserves of BC, the situation was quite similar to women: overweight and obesity prevalences were 41.3% and 35.4% respectively (Tableau 4); they were higher than those of 42.0 and 22.9% respectively, as described for Canadian adult men [32]. They were also higher than those of 39.8% of overweight and 19.2% of obesity as found in the general population of BC by Shields and Tjekpema [13].

When analyzing data from the Canadian Heart Health Survey carried out between 1986 and 1982, Torrance et al. [34] found similar results in Canadian men aged 20 to 69 years old for overweight (44.7%); however, they were much lower for obesity (13.4%). The findings of Tremblay et al. [33] were also similar to our results in men, with 70% of excess weight, of which 30% of obesity in FN men, which was higher than in all other ethnics in the context.

Unfortunately, researches on obesity are sparse [14], which makes comparison quite difficult. However, some studies evoked higher prevalences of obesity in Canadian FN populations on the reserves of BC. One example is from Self et al [23] who reported 25.5% of obesity in Inuit adult women (vs. 15.8% in men) aged 18 years and over living in Bella Coola valley, in BC; another example is from Liu et al. [35] who suggested 36.3% of obesity among Oji-Cree Indians, women and men included. These results are different from our findings in BC FN but confirm regional differences in the prevalence of EW [13,36,37,38].

In addition, our results are in accordance with Torrance et al. [34] in adults aged 20 to 69 years, suggesting more excess weight in men (44.7%) than women (25.2%), but more obesity in women (15.4%) than men (13.4%). This trend can also be observed for obesity in the European report on nutrition and health (2004) for overweight (35 à 53% for men vs. 20 à 35% for women); however for obesity, the report indicates similar prevalences in both sexes varying between 6 and 26% in men and between 6 et 31 % in women. Similar trend was observed by Mokdad et al. [26] (2003) who found 21% and 20% of obesity, respectively in men and women.

This study shows that EW is a real health problem in women and men FN living on the reserves of BC. Indeed, compared to the general Canadian population, they have higher prevalence of excess weight. In all studies mentioned above, either in women or in men, the prevalences were far lower than our findings, which suggests to carry out more detailed studies aiming to identify eventual factors associated to excess weight in FN women and men living on the reserves of BC

Evidence shows that many factors might be related to excess weight but this is not part of our study objective. Those factors include among others, low diet quality, socioeconomic level of households [39,40], age, education of the head of household [41, 42], regional feeding habits and physical activity [39,43], smoking [43] and gender [44,45]. We suggest those factors to be investigated in future analytic studies concerning the nutrition status of that population.

It is important to note the difference between the nutritional status of women and men. This is in agreement with the conclusion of the study carried out by Kiefer et al. [45], suggesting that men and women have different food behaviors and attitudes when it comes to nutrition and lifestyles.

5 CONCLUSION AND RECOMMENDATIONS

This study shows that excess weight, especially obesity, is a real health problem in the context of BC, in both genders.

We suggest that authorities initiate policies and programs aiming to reduce the prevalence of excess weight in the FN reserves in BC. In general, prevention of excess weight could result from balanced intakes and reduced total energy intake along with physical activity, for both women and men in order to avoid health and socioeconomic consequences of excess weight on that population. However, analytical studies aiming to identify the factors associated to excess weight in that specific population need to be carried out. This would be in accordance with the recommendations from WHO [21] for identifying new strategies allowing to understand the health determinants in the FN populations.

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