

Prevalence of Overweight and Obese Individuals Attending a Health Fair in Dominica

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Abstract

Global research of overweight and obese individuals is excruciatingly high. Records show over 1 billion presently overweight while 400 million are obese. Among these figures 2.8 million die annually. This is because increase in body mass index could lead to more cases of disability-adjusted life year, causing incidence of non-communicable diseases such as diabetes, cardiovascular crisis and other peculiar cancer cases like breast and colon cancer. With limited literature available on such matters among the Caribbean population, this study aims at providing some data by reporting current distribution of overweight and obese individuals in Dominica during a health fair. A total of 260 individuals volunteered. A total of 19 (7.39%), 81 (31.52%), 82 (31.91%), 75 (29.18%) presented as underweight, normal, overweight and obese respectively. This study thus emphasizes on the need for intervention in handling increasing cases of overweight and obese locals in Dominica.

Keywords: Prevalence; Overweight; Obesity; Body mass index; BMI; Health Fair; All Saints University School of Medicine; Dominica.

1. Introduction

The Commonwealth of Dominica was established in 1978 after it became independent from Great Britain.

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It is the largest of the Windward Island and lies between the French dependent territories of Martinique and Guadeloupe. The Island has lush rainforest, rich soil and an abundance of rivers. In the year 2000, the mid-year population of Dominica was estimated at 71,000 with 70.4% living in urban areas. Dominica has been known to produce a variety of agricultural products used for both local consumption and export. The main agricultural crops produced since 1992 have been banana, citrus, coconut and root crops. Dominica has not been self-sufficient in food production, especially in food high in protein. Meat and meat products, milk, cheese, fish and fish products are imported and accounts for over 2% of GDP. The amount of food available in terms of quantity has been estimated as, 1,034 (g/person/day) in 2007 for each individual in the population [1].

There have been great changes in food consumption during the end of the twentieth century in Dominica. Majority of the societies moved from a plant-based diet to a high fat, energy-dense animal based diet and along the same time became less physically active [1].

Body mass currently has been increasing at an alarming rate across the world, with around 400 million obese and 1 billion overweight worldwide. This is not just affecting adults but children too. It is estimated that around 17.6 children are regarded as overweight under five years of age [2].

In Dominica, the prevalence of overweight and obese individuals have not been studied and hence is incomparable with studies worldwide. The prevalence of obesity in adults in the United States was estimated to exceed 30% in most sex-age groups [3], which is higher compared to Canada [4].

The abnormal accumulation of body fat more than or equal to 20% of an individual's ideal body weight is termed as Obesity [5]. It has been associated with an increased risk of illness, disability and death. Bariatrics is a branch of medicine that deals with the study and treatment of obesity and has become a separate medical and surgical specialty.

Obesity had been traditionally classified into mildly obese (20-40% over ideal weight), moderately obese (40-100% over ideal weight) and severely or morbidly obese (100% over ideal weight) [5]. A more recent classification of obesity is using a measure termed as body mass index (BMI) which is calculated by dividing an individual's weight in kilograms (kg) by their height in meter squared (m^2). A BMI of $<18.5 \text{ kg/m}^2$ is considered underweight, $18.5\text{-}24.9 \text{ kg/m}^2$ is normal, $25.0\text{-}29.9 \text{ kg/m}^2$ is overweight, $30.0\text{-}34.9 \text{ kg/m}^2$ is obese class I, $35.0\text{-}39.9 \text{ kg/m}^2$ is obese class II and >40.0 is considered extreme obesity (obese class III) [6].

Excessive weight gain has been responsible for many serious and potentially life-threatening health issues such as hypertension, type II diabetes, coronary heart disease, myocardial infarction, hyperlipidemia, infertility and carcinomas of the colon, prostate, endometrium and breast [5].

How people get overweight is very clear, more calories are consumed than burned, and the excess calories are stored as fat [7]. However, the precise cause is not as straight forward and usually arise from a complex combination of factors. Genetic factors significantly influence how the body regulates appetite and the rate at which food is converted into energy. A genetic predisposition to weight gain, however, does not imply that a person will be obese. Eating habits and patterns of physical activity also play a significant role in the amount of

weight a person gains. A Recent study has indicated that the amount of fat in a person's diet may have a greater impact on weight than the number of calories it contains [8]. Carbohydrates such as cereals, breads, fruits, vegetables and protein are readily converted to fuel as soon as they are consumed. Majority of fat calories are immediately stored in fat cells, which adds to body weight and girth as they expand. A sedentary lifestyle which is particularly prevalent in Dominica, can contribute to weight gain [9]. In some cases psychological factors, such as depression and low self-esteem may also play role in weight gain [4].

The ability to lose weight depends upon the stage at which a person becomes obese. During childhood the excess calories are known to convert into new fat cells while in adults excess calories serve to expand existing fat cells [10]. Obese children can be at a high risk for both short-term as well as long term health consequences reaching into adulthood [11,12]. Dieting and exercise have been known to only reduce the size of fat cells and not eliminate them [9]. This can cause obese children great difficulty in losing weight as they may have up to five times as many fat cells as compared to someone becoming overweight as an adult [9].

Certain disorders and conditions may also present with obesity as a side effect such as Cushing's syndrome, hypothyroidism and using drugs such as steroids, antipsychotic medications and antidepressants [8].

The primary presentation of obesity is excessive weight gain and the presence of large amounts of fatty tissue. Secondary presentations may include arthritis, hernias, heartburn, asthma, gum disease, high cholesterol level, gallstones, high blood pressure, amenorrhea, complicated pregnancy, shortness of breath and sleep apnea [9].

The most preferred way for the diagnosis of overweight and obesity is with the use of the body mass index (BMI) which can identify the risk of developing both primary and secondary obesity related conditions [13]. Other methods that can also measure body fat is by using calipers to measure skin-fold thickness at the back of the upper arm and other sites [14].

Overweight and obese individuals who intend to lose weight must undertake dieting along with regular exercise. It has been found that as many as 85% of individuals who diet but does not exercise on a regular basis regain their lost weight within two years. The repeated losing and regaining of weight also encourages the body to store fat which may increase an individual's risk of developing heart disease [15].

2. Materials and method

A Cross sectional study was conducted and data was collected using a questionnaire and vitals examination by organizing a health fair. The health fair was conducted in April 2016 at the All Saints University School of Medicine in Roseau, Dominica and was organized with a written and signed consent obtained from the university and also from each patient involved in the study.

On the day of the health fair, 20 volunteers were responsible to assess patients using a questionnaire, the questionnaire was in a history taking format to assess variables such as demographic data, chief complaints, and history of present illness, past medical and surgical history, social history (alcohol, smoking and drugs), allergies, sexual and menstrual history and vitals. Vitals in the questionnaire were evaluated by measuring blood

pressure reading, random blood glucose measurement, body mass index (BMI) by another set of volunteers, all were carried out in separate assigned rooms. All volunteers were supervised constantly by physicians of the university. Volunteers were also advised to refer patients to the physician on-call during the event to assess patients with severe illness and severe injuries.

The various instruments used to measure vitals included: blood pressure monitors both manual and semi-automatic monitors, blood glucose monitors and an automated weight and height scale. In the April 2016 Health fair, a total of 260 people from the city of Roseau and nearby towns and villages responded to the health fair. Data collected from the health fair through the questionnaire and physical examination were prepared into an excel file with 23 variables and 260 observations. Volunteers were assigned for the organization of the 260 questionnaires and to compile data into an excel sheet. Two other volunteers were presented with the same organized questionnaire to confirm the data. The excel sheet was then imported to Stata IC 14 for analysis. Frequency distribution table to compare variables were employed and statistical significance was kept constant at $P < 0.05$.

3. Results

About 260 persons had their weights and heights measured during the health fair. More than half were females, 159 (61.63%). Participants were mostly middle aged, in the range of $(41-50) \pm 1.92$. Distribution of BMI readings grouped 19 (7.39%), 81 (31.52%), 82 (31.91%), 75 (29.18%) as underweight, normal, overweight and obese respectively. Sample size based on particular parameters was analyzed (Table 1).

Table 1: Distribution of Overweight and Obese individuals based on essential characteristics

Baseline Characteristics	Overweight n (%)	Obese n (%)	P value
Male	27 (27.27)	15 (15.15)	0.000
Female	55 (34.81)	60 (37.97)	0.000
Individuals with impaired blood glucose	15 (18.29)	11 (14.67)	0.554
Diabetic individuals	4 (4.88)	3 (4.00)	0.554
Individuals with family history of heart related diseases	62 (75.61)	64 (85.33)	0.088
Individuals with history of heart related diseases	28 (34.15)	30 (40)	0.063
Individuals with sedentary lifestyle	38 (46.34)	21 (22.83)	0.052
Alcohol consumers	39 (49.37)	36 (51.43)	0.001
Tobacco smokers	4 (5.13)	5 (7.14)	0.001

Age group of 51-60 showed the highest incidence of overweight and obese individuals, 19 (23.17%) and 27 (36%) respectively ($P < 0.05$). Participants with high BMI values had their blood pressure examined and irregularities was recorded (Table 2). Trend in high blood pressure was statistically significant with increase in BMI ($p = 0.006$). Further analysis revealed an addition of 0.25mmHg in blood pressure for every increase in BMI unit.

Table 2: High blood pressure among overweight and obese participants

Character of blood pressure	Overweight n (%)	Obese n (%)
Prehypertensive	21 (25.61)	19 (25.33)
Stage 1 hypertensive	18 (21.95)	19 (25.33)
Stage 2 hypertensive	10 (12.20)	11 (14.67)

4. Discussion

The most known defect associated with nutrition globally is obesity [16]. Data from WHO showed that an estimate of 2.8 million people die annually from being overweight or obese. Additional data also showed an incidence of 35.8 million cases of disability-adjusted life year (DALYs) [17]. Similarly, among the Caribbean population, obesity has intensified leading to underlying cause of most deaths [18]. Surveys done among different island countries in the Caribbean shows an estimate of 7-20% males and 22-48% females with BMI of 27kg/m² [19]. Investigation in Barbados also showed an increase in obese individuals from 7 to 16% in males and 33 to 38% in females from 1969 to 1981 [19]. High BMI tend to increase chances for coronary heart disease, ischemic stroke and type 2 diabetes mellitus [17]. They could also cause cancer of the colon, breast, prostate, kidney, endometrium and gall bladder [17]. As few literature are available on the current trend of overweight and obese individuals in the Caribbean, this study was aimed at providing sufficient data on overweight and obese locals in Dominica.

Similar to other reports, this study showed incidence of overweight and obese cases with females than males. This is usually because males tend to engage regularly in physical activity than females [20]. Although high BMI increases more chances for blood glucose irregularities, a study has shown otherwise [21]. This could be based on the fact that participants might not have reached the stage for diabetes mellitus to present. Familial trend of cardiovascular disease may be due to increased BMI, as most cardiovascular cases had significant record of high BMI. This is because increased BMI might increase the chances for atherosclerosis [22]. Lack of physical activity might also be a factor among the Dominican population, thus leading to high BMI [23]. Alcohol beverages has an energy value of 7 kcal/g, if addicted, this could lead to positive energy level leading to weight gain [24], this illustrates why alcohol consumers in this study had BMI irregularities. Although, alcohol addicts could suffer from malnutrition as calories from alcohol may not supply all of the body requirements [24]. Food play a major effect on BMI, thus survey on the feeding patterning among Caribbean islands has shown that a switch has occurred from locally processed foods to imported, more processed, energy-packed foods [22]. This habit could lead to more rapid cases of overweight and obesity, thus increasing chances for non-communicable diseases.

5. Conclusion

Overweight and obesity are potent silent killers and their prevalence among the Dominican population requires

necessary measures. Even with more prevalence among females, physical activities should be scheduled for both sexes in the population. Policy-makers could support by regulating food importation in order to encourage local farming among the population, thus avoiding energy-packed foods. Awareness and outreaches could also be employed in order to properly inform the populace. This will help reduce consumption of a high-fat diet and make citizens aware of the complications related to overweight and obesity. Some of these outreaches could also educate individuals on feeding patterns which provides balanced diet at low budgets. Health centers should also participate by monitoring and following up with overweight and obese individuals. Availability of prescription medications such as Orlistat (Xenical), Lorcaserin (Belviq), Liraglutide (Saxenda) and Phentermine-topiramate (Qsymia) that have been approved as weight-loss drugs for long-term use can be prescribed after evaluating the potential benefits against the possible risks of taking the medicine. Since nature of food intake plays a major role, the government could further assist by incorporating dietitians and nutritionists at various health centers for the prevention and management of overweight and obesity. This would also improve patient-access to nutrition services, expand the range of overweight and obesity related issues in Dominica and increase collaboration between physicians and dietitians.

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