MJSIR
Mountain Journal of Science and Interdisciplinary Research
PRINT ISSN: 2619-7855
ONLINE ISSN: 2651-7744
October-December 2019 • 79 (2 Suppl 1) : 90-100

Prevalence of Overweight and Obesity among Employees of Selected Regional Line Agencies in the Cordillera Administrative Region, Philippines

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Abstract

With the increasing trend of overnutrition, the implementation of appropriate nutrition action plan that is based on sound and extensive research data is being recommended. As part of developing an extensive health profile in Cordillera Administrative Region (CAR), Philippines, this study documented the prevalence of protein-energy malnutrition among the employees of 21 regional line agencies (RLAs) who are members of the Cordillera Regional Nutrition Committee (RNC). The study is a descriptive cross-sectional survey done among 395 permanent government employees. Data gathered were body mass index (BMI), waist circumference (WC) and waist-hip ratio (WHR). The employees were healthy, mostly non-pregnant females (65%) and selected through stratified random sampling. The mean BMI was 25.8 kg/m² (males=26.5; females=25.4) indicating that the employees are generally overweight. The combined overweight and obesity prevalence was 56.7% with males registering a higher prevalence of 64% (n=79) compared to 52.7% (n=135) in females. The mean WC of 90.7cm for male and 83.7cm for female employees were within the borderline. WHR was 0.91 for males indicating absence of abdominal adiposity but 0.86 for females showing risk of increased metabolic complications. The overall prevalence of high WC was 26% (13.7% in the males and 32.8% in the females) while high WHR was 44% (17% males; 59% females). Exercise and length of service were correlated with BMI and WC. The high prevalence of overweight and obesity among the government workers puts them at risk of non-communicable chronic diseases. Appropriate health and nutrition policies and programs must be instituted at once.

KEYWORDS

overweight
obesity
BMI
waist circumference
waist hip ratio
adult nutrition

Introduction

Adulthood is the longest period of a human cycle (Ruiz, 2010). Improved nutrition at this stage contributes to productivity, economic development, and poverty reduction by improving physical work capacity, cognitive development, school performance, and reducing disease and mortality (World Bank, 2006). Yet, adults are not spared of malnutrition particularly overnutrition such as overweight and obesity (World Health Organization [WHO], 2018). These lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance and risks of coronary heart disease,

ischemic stroke, type 2 diabetes mellitus and cancer of the breast, ovaries, colon, prostate, endometrium, kidney, colon, and gall bladder (Anderson et al., 2015; WHO, 2018). Worldwide, obesity has nearly tripled since 1975 when only 3% of men and just over 6% of women were obese and 20% of men and just under 23% of women were overweight. In 2016, more than 1.9 billion adults (18 years and older) or 39% were overweight while over 650 million (13%) were obese (WHO, 2018).

This trend is consistent in the Philippines. The national nutrition survey showed that among Filipino adults aged 20 years or above, the prevalence of overweight and obesity based on body mass index (BMI) almost doubled from 16.6% in 1993 to 31.1% in 2013 (FNRI-DOST, 2016). High waist circumference (WC) was noted among 3.0% of male and 18.5% of female Filipino adults (FNRI-DOST, 2015). High waist-hip ratio (WHR) was also recorded among 7.1% of males and majority (57.9%) of females.

Among the 17 regions in the country, the Cordillera Administrative Region (CAR) ranked 2nd highest, next to National Capital Region (NCR) in terms of the prevalence of overweight and obesity (35.4%). The mean BMI of 23.9 kg/m^2 for both sexes was slightly higher than the national mean of 23.34 kg/m^2. The mean WC of 78.2cm among males was 5th highest and 8th highest for females (76.8cm). The region was among the three regions with the lowest prevalence of high WC (1.6%) even if 16.9% of females had high WC. The mean WHR of 0.89 among males and 0.86 among females were within the borderline. The prevalence of high WHR among males (5.2%) placed the region as the 3rd lowest but the 57.9% prevalence of high WHR among females was the 2nd highest. The same survey revealed that the government officials, managers, and executives ranked 2nd with the highest prevalence of hypertension which is associated with overweight and obesity.

Increasing degrees of overweight lead correspondingly to an increase in mortality rates. This rise in obesity has led to widespread calls for regular monitoring of overweight and obesity prevalence in all populations (Ng et al., 2014). Comparable, up-to-date information about nutritional levels and trends is essential to quantify population health effects and to prompt decision-makers to prioritize action. The basis for planning and implementing nutrition programs includes nutritional status. There is an urgent call for global action and leadership to help countries do more effective intervention.

However, literature is scanty on the nutrition situation of Filipino adults in workplaces or by occupational groups like government workers (FNRI-DOST, 2015; Apellido, 2018). Yet, the need for baseline data is an all-time high. These data are needed for better and more focused programming of interventions and increased awareness on proper nutrition, especially among government workers. This study was conceptualized to help fill this data gap. As one of the members of the Cordillera Regional Nutrition Committee (CRNC), the researcher is much aware of the importance of these data in developing a nutritional program.

The study evaluated the nutritional status of the permanent employees of RNC-member agencies based on BMI, WC and WHR. Further, it identified the socio-economic, lifestyle and work-related variables that may influence the nutritional status. Differences in the BMI of the employees when grouped according to the socio-economic variables were also assessed.

The information gathered in the study is of relevance primarily to the Human Resource and Development offices in the different government agencies. The results can serve as bases in planning interventions and other nutrition and health-related activities. In addition, public health agencies such as the National Nutrition Council (NNC), health, and nutrition committees at various levels can also use the results in crafting policies at the national level. Other regions and offices can also use the results of this research for future studies.

Methodology

Research Design and Instrument

The descriptive cross-sectional survey design was used in this study. A survey questionnaire designed by the researcher was used. Before its use, the questionnaire was reviewed by experts and was also pre-tested. The survey form was either self-administered or accomplished through interview by the research staff.

Participants

The respondents of the study were permanent employees selected from the 21 regional line agencies (RLAs) in CAR. These agencies are all located in Baguio City and La Trinidad, Benguet and are members of the Cordillera Regional Nutrition Committee, who approved the study. The National Nutrition Council (NNC–CAR), the secretariat for the committee, provided the list of the RLAs. Letters seeking permission were sent to the regional directors and were approved. Schedules for assessment and interview were set with the agency's representative to the Regional Technical Assistants in Nutrition (RTAN), the sub-committee of the RNC. The list of the permanent employees was obtained from the Human Resource Management Office (HRMO) of each participating agency as a basis for probability sampling. To be included, the employee must not be on leave, be apparently healthy and signify intent and willingness by signing an informed consent after a thorough explanation by the researcher and/or agency's representative. Healthy means that the person is not suffering from a disease condition that significantly affects his/her food intake and ability to stand. From a sampling frame of 1,541 employees, 395 employees were randomly sampled based on the 31% lastest national prevalence for overweight and obesity.

Anthropometric Measurements

Anthropometric measurements were taken by the researchers with the assistance of trained nutrition students and, in some occasions, by a nutritionist-dietitian of the NNC-CAR. The weight and height were taken using calibrated beam balances (Detecto) scale while a non-stretchable fiberglass tape was used to measure the waist and hip circumferences. The anthropometric data served as bases in the computation of body mass index (BMI) and waist-hip ratio (WHR). The BMI was derived by dividing the weight in kilograms with the height in meters squared while the WHR was computed by dividing the waist circumference with the hip measurement.

Body Mass Index (BMI). An estimate of body fat and predisposing factor for diseases such as heart disease, high blood pressure, type 2 diabetes, gallstones, breathing problems, and certain cancers among others, BMI is significantly correlated with body fat (Brown, 2017) and is more accurate than skinfold measurements (Harvard Medical School [HMS], 2017). It has traditionally been the chosen indicator to measure body size and composition and to diagnose underweight and overweight (WHO, 2011). It provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and all ages of adults but should be considered as a rough guide because it may not correspond to the same degree of fatness in different individuals (WHO, 2018).

With abdominal fat as the worst of the worst (HMS, 2017) and fat distribution seemingly more important than total body fat (Koster et al., 2008), the study used alternative measures that reflect abdominal adiposities such as waist circumference and waist–hip ratio. This is based largely on the rationale that increased visceral adipose tissue is associated with a range of metabolic abnormalities, including decreased glucose tolerance, reduced insulin sensitivity and adverse lipid profiles, which are risk factors for type 2 diabetes and cardiovascular risk (CVD). Waist circumference and waist hip ratio are two common ways to measure abdominal obesity and are equally good in predicting health risks (Harvard T.H. Chan School of Public Health, 2018). Having a large waist may mean higher risk for health problems compared to someone with a trim waist even if they are not overweight based on BMI or other parameters.

Over the years, assessing weight and health risk among adults involved three key measures namely, BMI, WC & WHR that correlate well with objective measurements of body fat using MRI, CT scan, or densitometry (De la Paz, n.d.). Waist circumference provides an independent prediction of risk over and above that of BMI (National Institute of Health [NIH], 2000). A high waist circumference is associated with an increased risk for type 2 diabetes, dyslipidemia, hypertension, and CVD in patients with a BMI between 25 and 34.9 kg/m^2.

Data Analysis

The calculated values were interpreted based on WHO and International Diabetes Foundation guidelines. BMI of 25.0-29.9 and 30.0 or higher indicates overweight and obesity, respectively (WHO, 2018). The presence of abdominal or

central body fat adiposity was indicated by a waist circumference of ≥102cm for males and ≥88cm for females, and by a waist hip ratio of ≥1.0 for males and ≥0.85 for females. The data gathered were subjected to appropriate statistical methods such as mean, percentage, chi-square, *t*-tests and Pearson's correlation.

Results and Discussion

Profile of the Respondents

Socioeconomic Profile. Females outnumbered males at an almost 2:1 ratio (Table 1). Their ages range from 21 to 64 years with a mean of 43 years, which implies that the employees are generally in mid-adulthood and are expected to be in the peak of their productive years.

The distribution of the employees is diverse with those in their senior years as the smallest group and the majority belonging to the 40-59 age group. Only 16% are young adults within the age group of 20-29 years.

In terms of gross family income on a monthly basis, few employees indicated extremely low and high income. Majority of the employees had incomes ranging from Php 10,001 to Php 30,001.

Nature of job and length of service. In carrying out their daily tasks, 49% of the employees are sitting down most of the time (Figure 1). These are mostly the employees in managerial and clerical positions. In contrast, about 9% of the employees, mostly the utility personnel, move around most of the time. The rest (42%) or about 4 in every 10 employees have 50%-50% distribution of sitting and moving time. In terms of length of service, almost 33% are relatively new in their jobs as they had been working for five years or less during the time of the survey (Figure 2). Exactly 50% of them had been working for their agencies for 16 years or longer.

Exercise and Health Conditions. Physical activity and exercise are forms of movement that can benefit health (Stephenson & Schiff, 2019). Physical activity refers to movements resulting from contraction of skeletal muscles while exercise refers to physical activities that are planned and structured for a particular purpose such as having fun or increasing muscle mass. Regular and adequate levels of physical activity are necessary for energy balance and weight control; improves muscular and cardiorespiratory fitness as well as bone and functional health; reduces the risk of hypertension, coronary heart disease, stroke, diabetes, various types of cancer (including breast cancer and colon cancer), and depression; and reduces the risk of falls as well as hip or vertebral fractures (WHO, 2019; Asian Food Information Center, 2006).

The Department of Health (2010) recommends that older Filipino adults should do at least 30 minutes daily physical activity consisting of one or a combination of activities for daily

Table 1

Socioeconomic Profile of the Employees (n=395)

Variables	Frequency	Percentage (%)
Sex		
Male	139	35
Female	256	65
Age, years (mean = 43 years)		
20-39	158	40
40-59	215	54
> 60	22	6
Ethnicity		
Kankanaey	150	38
Ibaloi	77	20
Ilocano/Tagalog	68	17
Others	100	25
Religious Affiliation		
Roman Catholic	254	64
Protestant	72	19
Others	69	17
Educational Attainment		
Elementary	19	5
High school	154	39
College/Vocational	178	45
Postgraduate	44	11
Monthly Income (Php)		
<10,000	111	3
10,001 - 20,000	108	27
20,001 - 30,000	111	28
30,001 - 40,000	40	10
40,001 - 50,000	74	19
> 50,000	51	13

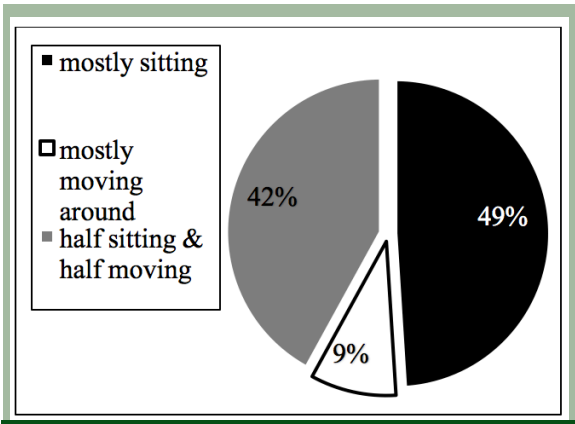

Figure 1. Distribution of Employees by Nature of Work

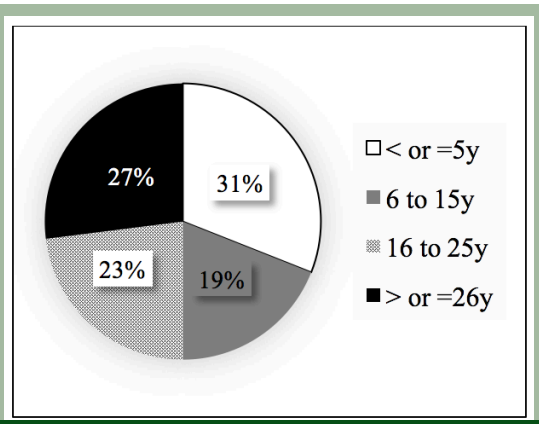

Figure 2. Distribution of Employees by Length of Service

living: exercise, dance and recreational activities; muscle strengthening and flexibility activities, balance and coordination; and activities in the workplace. Considering the difficulty of quantifying the duration of physical activity for each employee, this study was limited to the perceived exercises according to the respondents.

Table 2 shows that 51% (n=203) of the employees were not engaged in any form of exercise on a regular basis, implying a sedentary lifestyle which is not good for health. The Harvard Medical School (HMS, 2015) summarized that people who sat for prolonged period of time had higher rates of heart disease and were more likely to die from any cause, even if they exercised regularly, compared with people who spent less time sitting. These effects were more pronounced in people who did little or no exercise.

As to medical condition, four (4) in every 10 employees had been diagnosed medically.

Table 2

Distribution of Employees by Engagement in Exercise

Factors	Classification	Percent
Exercise	No regular exercise	51
	With regular exercise	49
Medical Condition	Diagnosed of an illness	42
	No diagnosis	58
Medication	Currently on medication	28
	No medication	72
Food Supplements	Presently taking	35
	Not taking	65

Hypertension affected majority (58%) of the employees whether they were diagnosed or not. Other illnesses include diabetes (23%), gout (11%), and asthma (6%). Not all of those diagnosed with medical condition are taking medications at the time of the study. Less than half (42%) of those with medical diagnosis were on medication, mostly are diagnosed with hypertension. Similarly, few employees take medications even if they were not diagnosed by a medical practitioner. The most common "self-prescribed" medicine is the anti-hypertensive amlodipine.

Regardless of health condition, more than one-third of the employees are taking food supplements. This study, however, did not include investigating the reasons for such intake.

Nutritional Status of the Employees

Body Mass Index. The employees' weight ranged from 50kg to 107kg with a mean of 63.6kg while height ranged from 137cm to 178cm with a mean of 157cm. The calculated BMI ranged from 17.6kg/m², which indicated Chronic Energy Deficiency (CED), to 39kg/m², which indicated obesity. The BMI mean of 25.8kg/m² is classified as overweight (Figure 3). Both male and female respondents have a BMI classified as overweight, with the BMI of males higher than that of females by 1.1kg/m². The greater BMI among males is somehow expected owing to their greater body composition compared to females.

Based on BMI values, two employees – one male and one female - were found suffering from chronic energy deficiency (CED) since their BMI

is lower than 18.5kg/m². One-third (35%) of male employees and almost half (47%) of the females (Figure 4) were of normal nutritional status (BMI of 18.5-24.9). For both sexes, overweight prevalence (45%) was slightly higher than the percentage of those with normal nutritional status (43%).

The prevalence of overweight and obesity was higher among male employees by 5.6%. Compared to national data, the combined prevalence of overweight and obesity among the regional employees is more than twice higher for males (27.6% vs. 64%) and way above among females (34.4% vs 52.7%). For both sexes, the combined prevalence rate is 56.7% which is way higher than the prevalence among Filipino adults at the national (31.1%) and regional (35.4%) levels (FNRI-DOST, 2016). In 2015, the CAR ranked second to the National Capital Region with the highest prevalence of overnutrition as indicated by the BMI. Our data shows that government employees contribute significantly to overweight and obesity in the region.

Statistical analysis revealed a highly significant difference ($p<0.01$) in the BMI of the employees when grouped according to sex as shown in Table 3. Males had a higher BMI. A significant difference was also observed when the employees were grouped according to the nature of their job. Employees who move around most of the time, thus less sedentary, had lower BMI values.

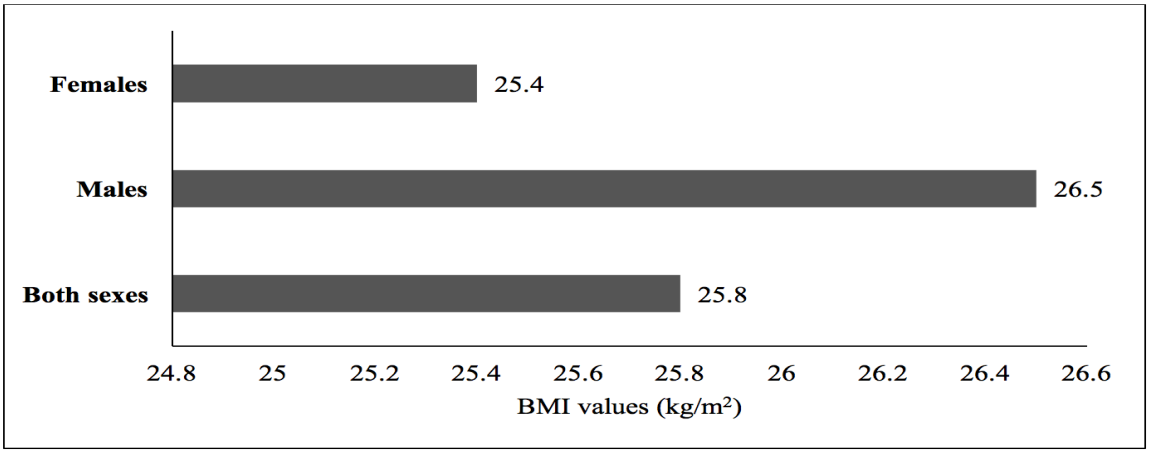

Figure 3. Mean BMI of the employees by sex (kg/m²)

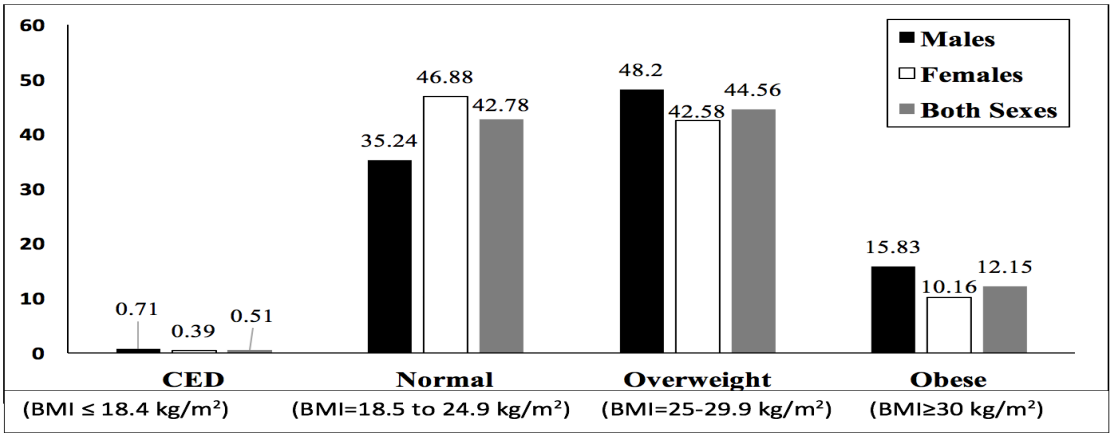

Figure 4. Distribution of employees by nutritional status based on the BMI, in percent

Table 3

Statistical Analysis for Differences in the Body Mass Index

Variables	T computed/X^2C	p-value
Sex	0.38	0.0007**
Age	0.02	0.876^{ns}
Religion	1.17	0.335^{ns}
Ethnicity	0.23	0.87^{ns}
Education	0.46	0.633^{ns}
Work Years	1.08	0.382^{ns}
Income	1.70	0.169^{ns}
Nature of job	1.25	0.038*
Exercise	-2.43	0.990^{ns}
Medical Condition	-1.77	0.958^{ns}
Intake of medicine	-2.2	0.984^{ns}
Food Supplements	-0.72	0.761^{ns}

**significant at (p<0.05)* ***highly significant(p<0.01)*
ns – not significant

Waist circumference. The distribution of body fat is a more important indicator of health risk than weight or BMI (Brown, 2017). Waist circumference is used to assess central body fat adiposity, which is recognized as potbelly or apple shape and highly correlated with metabolic abnormalities and chronic diseases. A high waist circumference indicates presence of central body fat adiposity, thus, increased risk for metabolic complications such as diabetes. It also indicates abdominal obesity. Clinical observations and basic research results agree that excessive fat inside the abdomen is a major contributor to cardiovascular disease (HMS, 2017). The normal waist circumference should not go beyond 87cm for female adults and 101cm for males.

The regional male employees had waist circumferences ranging from 69.5cm to 115cm with a mean of 90.6cm (Table 4). This is higher than the national and regional mean WC of 78.7cm and 78.2cm, respectively (FNRI-DOST, 2016). For females, waist circumference ranged from 64 to 112cm with a mean of 83.7cm. This is also higher than the 77.5cm and 76.8cm mean WC for Filipino female adults at the national and regional levels, respectively.

The female employees were equally distributed in the three classifications (low, borderline, and high) of waist circumference. One-third had high waist circumference. On the other hand, male employees generally have low to borderline waistline. Only one in every 10 male employees had a high WC. With both sexes combined, high WC is noted among 26% of the employees.

Similar to BMI-based prevalence of overweight and obesity, the prevalence of high WC among the CAR RLA employees is again much higher than national data on Filipino adults (18.5% for females and 3.0% for males) based on the reports of the FNRI-DOST (2016). Regardless of sex, around 25% of the employees had high waist circumference, indicating presence of excess body fat in the abdominal area.

Table 4

Distribution of Employees by Classification of WC and WHR

Indicators	Low		Borderline		High	
	F	%	F	%	F	%
Waist circumference						
Males (u=90.6cm)	57	41	63	45	19	14
Females (u=83.7cm)	89	35	83	32	84	33
Both Sexes	146	37	146	37	103	26
Waist Hip Ratio						
Males (u=0.92)	28	20	88	63	23	17
Females (u=0.86)	39	15	66	26	151	59
Both Sexes	67	17	154	39	174	44

Waist-Hip Ratio. The WHR is another indicator of body fat adiposity in the visceral region of the body. Among the male employees, the WHR ranged from 0.75 to 1.17 with a mean of 0.92, which indicates the absence of excessive body fat in the central region of the body (Table 4). In contrast, the female employees had WHR ranging from 0.7 to 1.1 and a mean of 0.86 which indicated central body fat adiposity.

Majority (59%) of the female employees had high WHR in contrast to only 17% in male employees. The prevalence of high WHR among female employees is lower than the national data of 63.2% but twice higher than the 8% for males. Considering both sexes, 4 in every 10 employees exhibit body fat adiposity in their abdominal areas. The higher WHR in women than men maybe partly explained by the higher tendency among females to increase the proportion of fat to body weight as they go through middle age (Harvard Medical School, 2019). Further, sex differences of body fat which are evident at the fetal stage continue throughout adult life with females having a more peripheral distribution of fat in early adulthood (Wells, 2007). Parity or number of pregnancies and menopause both induce a more android or central body fat distribution with increasing age.

Literature on the prevalence of and rationale for overnurition among government workers is very scanty. Partly, it maybe attributed to the health benefits of work and the detrimental impacts of unemployment as work can lead to better health though two mechanisms - financial and psychological (Goodman, 2015). With employment comes an increased household income thus availability of financial means to access nutritious food and health care among others. The profile of the respondents in this study also show that about half of the employees sit most of the time (Figure 1) and majority are not engaged in a regular exercise (Table 2). In both cases, less energy is spent. The study has yet to include the food and energy intake of the employees.

Overweight and obesity increase the risk of having cardiovascular diseases, Type 2 diabetes, various forms of cancer and musculoskeletal disorders like arthritis and gout (NNC, 2015; Anderson et al., 2015). They also pose risks to hypertension, dyslipidemia, and sleep apnea, breathing problems and liver and gallbladder diseases. Hypertension, type 2 diabetes and the metabolic syndrome are among the most commonly reported complications of adult obesity (Galicia et al., 2011). Obesity strains the heart which must work harder to nourish the unnecessary fat cells (Bellosillo, n.d.). Excess body weight as what happens in obesity, is among the causal factors identified in high blood pressure or hypertension, the others being excess dietary sodium, inadequate intake of fruits/vegetables, sedentary lifestyle, and excessive alcohol.

Both generalized and abdominal obesity are associated with increased risk of morbidity and mortality (WHO, 2008). The main cause of obesity-related deaths are cardiovascular diseases (CVD), for which abdominal obesity is a predisposing factor. Nonetheless, it is unclear which anthropometric measure is the most important predictor of risk of CVD in adults.

Abdominal obesity clearly affects a significant number of the employees who have to understand that excess fat in the abdominal area maybe subcutaneous or visceral. The subcutaneous fat is located in the fatty tissue just beneath the skin while the visceral fat are deposited around abdominal organs (Stephenson & Schiff, 2019). Both behave like any other fat in the body which when excessive, has serious consequences for health including high levels of low density lipoproteins (LDL) or bad cholesterol and triglycerides; low levels of high density lipoproteins (HDL) or good cholesterol; and impairs the body's responsiveness to insulin, raising blood sugar and insulin levels (HMS, 2017). Excess body fat contributes to major causes of death and disability, including heart attacks, strokes, high blood pressure, cancer, diabetes, osteoarthritis, fatty liver, and depression.

Correlation of Nutritional Status with Employees Profile. As gleaned from Table 5, there is a highly significant correlation between exercise and BMI ($p<0.01$) among the employees. Employees that are moving most of the time have lower BMI while higher in employees that are mostly siting. This result supports the findings of National Nutrition Council (NNC, 2015) that lack of physical activity is a major risk factor in the increasing obesity prevalence. While carrying out a regular physical activity is a personal choice, it may also reflect on the persistent impact of the work environment for the employee. Nelson et al. (2014) in their study of patient care workers reported that physical activity was more strongly related to workplace characteristics regardless

of age. Therefore, a workplace-based physical activity should target workers of all ages.

Similarly, only length of service was found to be correlated with the waist circumference and no variable was associated with the WHR. The association of length of service may have come about as a cumulative effect of what each employee does daily primarily in terms of energy expenditure and food consumption. Assuming all other factors are equal, employees who move about more often, would tend to expend more calories which can reduce chances of becoming overweight.

Table 5

Statistical Analysis for Differences in the Body Mass Index

Variables	BMI	WC	WHR
Sex	0.66^{ns}	0.421^{ns}	0.163^{ns}
Age	0.16^{ns}	0.141^{ns}	0.943^{ns}
Religion	0.75^{ns}	0.657^{ns}	0.429^{ns}
Ethnicity	0.09^{ns}	0.836^{ns}	0.674^{ns}
Education	0.88^{ns}	0.683^{ns}	0.827^{ns}
Work Years	0.36^{ns}	0.031*	0.744^{ns}
Income	0.85^{ns}	0.693^{ns}	0.263^{ns}
Nature of job	0.08^{ns}	0.248^{ns}	0.833^{ns}
Exercise	0.001**	0.527^{ns}	0.317^{ns}
Medical Condition	0.24^{ns}	0.823^{ns}	0.282^{ns}
Intake of medicine	0.23^{ns}	0.715^{ns}	0.190^{ns}
Food Supplements	0.28^{ns}	0.975^{ns}	0.297^{ns}

**significant* ***highly significant*

Conclusions

Regardless of sex, the government employees of the Cordillera Regional Nutrition Committee member agencies are generally overweight and obesed based on BMI. Such unhealthy condition put the employees at higher risk for non-communicable diseases including hypertension, Type 2 diabetes, cardiovascular diseases (heart disease and stroke), musculoskeletal disorders like osteoarthritis and several forms of cancer like endometrial, breast and colon cancer. Many also have high waist circumference and waist hip ratio that put them at risk of metabolic complication. These can be attributed primarily to sedentary lifestyle among others. Further evidence is the diagnosis of hypertension among almost half of the employees, which can have an impact on the employees' quality of life and productivity.

Recommendations

It is recommended that the NNC-CAR firms up its plan on Weight Management Program and actively advocate the adoption of this by each of the agencies. Further, each agency should promote an active lifestyle and institutionalize regular conduct of nutritional assessment and implementation of nutrition related activities, particularly those that will halt prevalence of overweight and obesity. All agencies and offices may add in their employee benefits annual medical check-up that includes complete blood count and other basic laboratory and diagnostic tests. Further, Benguet State University, being the only institution of higher learning offering a degree program in human nutrition, may enhance its extension and research program on nutrition and health, and target more agencies for these programs. Regular nutritional assessment, implementation of health and nutrition programs for the employees and enhancement of existing ones such as weekly exercises, nutrition and health seminars towards a healthy lifestyle, are strongly recommended. It is highly recommended that all agencies including the national government adopt policies and seriously implement actions to help curb the rising incidence of overweight and obesity.

Acknowledgment

The researcher expresses profound gratitude to the National Nutrition Council – CAR for making available its staff and equipment and transporting the same to and from different agencies; the Regional Technical Assistants in Nutrition (RTAN) for endorsing the study; the Regional Nutrition Committee and the Benguet State University for approving the study; the 21 Regional Line Agencies for allowing their employees to participate; the government employees for their cooperation; RTAN Members for coordinating the activity in their respective agencies and the BSND students who served as nutrition assessors and enumerators.

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