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Dietary Intake and Nutritional Anthropometry of the Non-Academic Employees of the University of Sri Jayewardenepura (USJP), Sri Lanka

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Abstract

Studies on nutritional status of state employees are limited and therefore the present study was conducted to determine the nutritional status of a selected sample of employees attached to the University of Sri Jayewardenepura (USJP), who directly involve in facilitating the academic activities of the University. This is a cross-sectional study carried out by interviewing 130 non-academic members of USJP staff for collecting information on their socio-demographic factors, physical activity levels and food habits. Body Mass Index (BMI) and Waist to Hip ratio (WHR) were calculated according to the WHO anthropometric standards while seven-day food consumption was recorded to assess the food and energy intake in the participants. The prevalence of overweight and obesity in the sample was32.3% and 10.8% respectively while 53.8% and 63.9% of the participants had WC (waist circumference) and WHR. Among the participants, 79.2% of members had a sedentary lifestyle spending most of their time sitting without exercises at work and at home. Moreover, they showed a significant relationship with overweight and obesity ($r=0.4$, $p<0.05$).In the sample,both males and females had higher average protein and energy intakes than required. Participants with higher energy intake showed a positive relationship with those who are overweight and obese ($r=0.5$).The contribution of calories from carbohydrate, protein and fat in males was 70.3 %, 11.3% and 18.4% respectively and same in the females was 66.0%, 11.6% and 22.4% respectively. Further, a significant difference ($p<0.05$) was observed in carbohydrate intake and fat intake between males and females. Since overweight and obesity appear as a serious concern in general health of the public it is important to carry out proper awareness programs to educate workers on the importance of healthy dietary patterns and regular exercises for their better well-being.

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1. Introduction

The prevalence of non-communicable diseases (NCD) is rapidly increasing in both developed and developing countries due to unhealthy diet and physical inactivity associated with lifestyle changes. Obesity is one of the major risk factors associated with the development of non-communicable diseases such as type 2 diabetes mellitus and cardiovascular diseases (Jayawardana*et al*., 2013). According to recent statistics, more than 90% of the patients with diabetes mellitus are either overweight or obese (Gatineau *et al*., 2014) and one in five adults in Sri Lanka is either diabetic or pre-diabetic (Katulanda *et al*., 2010). Scientific studies have shown that higher percentage of body fat in Asian populations than the European populations leads for development of non-communicable diseases (Engeland*et al*., 2003). Katulanda *et al*., (2010) has shown that there is an association between the rapid increase in the prevalence of type 2 diabetes mellitus and cardiovascular diseases with abdominal obesity, which is common in Asian populations. According to David *et al*., (2018) consumption of more refined fast release staple

carbohydrate food is one of the major causes for the development of abdominal obesity. Carbohydrate rich diets release glucose quickly into the blood stream increasing the blood sugar and insulin levels. According to Katulanda *et al*., (2003) high blood glucose levels increase risk of hypertension, retinopathy, nephropathy, neuropathy and macro-vascular diseases. These health complications result in an increase in the risk of morbidity and mortality, reducing the life expectancy of diabetic patients.

It is important to monitor the nutritional status in a particular community through public awareness programs to minimize the health complications associated with poor food habits and physical inactivity. The nutritional status of a community can be evaluated using biochemical parameters, anthropometric measurements and dietary intakes of individuals over a given period of time (Jayawardana *et al*., 2014).The dietary habits of individuals may vary due to socioeconomic factors, cultural practices, and educational levels and hence it is difficult to assess the dietary habits due to variability in food preference and availability. Therefore, the detailed food record is one of the best methods used to assess the dietary intakes and food patterns of individuals (Kowalkowska *et al*., 2013). In addition to the dietary evaluation, anthropometric measurements are useful to assess nutritional status of individuals in a particular population as they provide information about size, proportion and composition of the human body as per the standard measurements. Interestingly, these measurements can also be used to assess the prognosis of chronic and acute diseases (Garcia *et al*., 2007).

Evaluation of the nutritional status of government employees is very important as they directly contribute to the development process and economy of the country. The efficiency of work depends on the health and physical status of the workers in addition to adequate nutrition in their diet. Therefore, public awareness programs needs to be conducted to create awareness on the efficacy of health and nutrition status among workers for better performance at the work place. Non-academic staff members are an essential part the university system where their efficiency is important to maintain a proper study environment in the university. The present study therefore was carried out to evaluate the dietary intake and nutritional anthropometry of non-academic employees in different faculties of the Sri Jayewardenepura University.

2. Materials and Methods

2.1 Study Design

This study was designed as a cross sectional study using non-academic employees in different faculties of the Sri Jayewardenepura University over a period four months. The details of the research were explained to participants who volunteered for the study prior to conducting the survey. A written consent was also obtained from all the participants before commencement of the study. Following the above pre-requirements the participants were interviewed by administering a questionnaire set for collecting information on their socio-demographic status, health status and job characteristics and in addition they were asked to record types and frequency of various food items they consumed during a seven-day period.

2.2 Sample Size and Sampling Procedure

The sample size of the study was determined by the statistical equation $n=Z^2P\ (1-P)/d^2$. Where n is the sample size, Z is the standard normal deviation for a chosen confidence level, P is the proportion of subjects with the interested characteristic (Normal BMI value range) and d is the precision. As per the calculation, the sample size obtained was of 130. The participants (non-academic staff members)were randomly selected based on the willingness of the participants from faculties' *viz*. Medical Sciences (58), Applied Sciences (30), Management Studies (23), Humanities and Social Sciences (19). Due to time the constraint executive officers were not included in the sample. Participants who are conversant in both Sinhalese and English were only considered for the assay excluding those on special diets due to various complications

2.3 Data collection

Data were collected by an interviewer administering a questionnaire withquestions on socio demographic status, health status and physical activity of participants. Another questionnaire was given to the participants to fill in seven days giving a detailed food record to find out their types and patterns of food consumption. In addition to the above pertinent anthropometric measurements such as weight, height, waist circumference, hip circumference and mid upper arm circumference were also recorded of each participant in accordance with standards set by the World Health Organization (WHO).

2.4 Physical Activity Level

The physical activity level of the participants was measured according to a questionnaire comprising information regarding the type of exercises engaged by the participants during the week, the number of hours spent on a particular exercise, and the number of days engaged in exercise. In addition details of their job characteristics were recorded to decide their activity level and time spent seated on the bench during the week. Based on this information physical activity levels were classified into four groups *viz.* workers who spent most of their time sitting or standing with little body movement as sedentary active group, workers who engaged in daily exercise for at least one hour as moderately active group, workers who engaged in strenuous exercises such as dancing/ swimming for several hours as vigorously active group and workers who engaged in vigorous exercise like cycling continuously as extremely active group.

2.5 Anthropometric Measurements

Anthropometric measurements of weight, height, waist circumference (WC) and hip circumference (HC) were measured according to the WHO standard descriptors using a digital scale and non-stretchable commercial tape. Weight was measured to the nearest 0.1 kg using a digital weighing scale with the participant standing on the scale with bare foot and less clothing as possible. Height was measured to the nearest 0.1cm using two non-stretchable commercial tapes by distributing weight evenly over both feet. WC was taken using the midpoint between the lowest point of the last rib and the crest of the Ilium to the nearest 0.1 cm. HC was taken as the largest circumference at the level of buttocks when the subject was standing on a flat floor (WHO, 2008).

2.6 Seven Day Dietary Record

Dietary intake was assessed by a seven-day dietary record during the week. A dietary record form was given to the participants with instructions from a trained dietician for recording the consumption of food and beverages over the week. Information on portion size was described using common utensils (tea spoon, table spoon, standard glass and home containers etc.), photographs and grams indicated on printed packets.

2.7 Data Analysis

Sri Lankan food composition data and detailed food records were used to calculate the carbohydrate, protein and fat intakes by participants in addition to individual energy intakes. The total energy requirement was calculated by the basal energy expenditure (BEE) as per the Harris Benedict equation and the protein requirement was calculated using the standard equation.

2.7.1) Calculation of energy requirement

For males:
BEE = (667+13.8w+5.0 h-6.8a) b* kcal

For females:
BEE = (665+9.5w+1.8h-4.7a) b* kcal

Where; w- Weight in kg; h- Height in cm; a- Age in complete years; b*-activity factor

2.7.2) Calculation of protein requirement

Protein Requirement = 0.75g/Kg BW/day

Body Mass Index (BMI) and Waist to Hip Ratio (WHR) were calculated according to the standard equations. The data were analysed using the Statistical Package for Social Science (SPSS) Software (Version 19).

2.8 Ethical Consideration

The ethical approval for the study was obtained from the Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura.

3. Results

3.1 Socio-demographic Characteristics of Study Population

Among the total of 130 staff members of the sample 53.9% were males (n=70). The average age of males and females were 40 ±9.8 (SD) years and 37 ±9.8 (SD) years respectively. Among them 78.5% were married and 21.5% were single. All members of the study population were Sinhala Buddhists. All participants had school education and (76.9%) of them had studied up to tertiary level (advanced level/diploma/degree).Majority of the population comprised clerks and computer application assistants (65.4%). There were also 19 technical officers (14.6%) and 26 labourers/ lab attendants (20%). The living areas of staff members were categorized into urban, suburban and rural. Majority of staff members (42.3%) were living in suburban areas. Representations of the urban and rural areas were 38.5% and 19.2% respectively. Table 1 represents the socio-demographic characteristics of the participants.

3.2 Physical Activity Level and Health Status of Participants

As reported, 62% of the participants had a less active lifestyle while 38% of staff members had a moderately active lifestyle based on their occupation and exercises. Considering the health status of the participants, 13.8% of the staff members were suffering from hypertension while 6.2% and 2.3% of them had hypercholesterolemia and diabetes respectively.

Table 1. Socio-demographic characteristics of the non-academic staff members of the University of Sri Jayewardenepura (USJP)

Characteristics	Male n (%)	Female n (%)	Total n (%)
Age group			
20-29	10 (7.7%)	18 (13.8%)	28 (21.5%)
30-39	25(19.2%)	18(13.8%)	43(33.1%)
40-49	21(16.2%)	17(13.1%)	38(29.2%)
50-59	14(10.8%)	7(5.4%)	21(16.2%)
Marital status			
Single	11 (8.5%)	17 (13.1%)	28 (21.5%)
Married	59 (45.4%)	43 (33.1%)	102 (78.5%)
Ethnicity			
Sinhala	70 (53.9%)	60 (46.1%)	130(100%)
Religion			
Buddhist	70 (53.9%)	60 (46.1%)	130 (100%)
Educational Level			
Secondary (Grade 5-11)	27 (20.8%)	3 (2.3%)	30 (23.1%)
Tertiary (A/L, Diplomas, Degrees)	43 (33.1%)	57 (43.8%)	100 (76.9%)
Occupation			
Technical officers	11 (8.5%)	8 (6.2%)	19 (14.6%)
Clerks/Computer application assistants	37 (28.5%)	48 (36.9%)	85 (65.4%)
Labourers/Lab Attendants	22 (16.9%)	4 (3.1%)	26 (20%)
Type of residence			
Urban	29 (22.3%)	21 (16.2%)	50 (38.5%)
Sub urban	28 (21.5%)	27 (20.8%)	55(42.3%)
Rural	13 (10%)	12 (9.2%)	25(19.2%)

3.3 Nutritional Anthropometry

The anthropometric profile of the participants is shown in Table 2. The mean weight and height of the males and females of the study population were 62.1±9.8kg: 1.6 ± 0.1 m and 55.2±11.3 kg: 1.5±0.1 m respectively.

Waist circumference (WC) which is an important measure for predicting the development of abdominal obesity and metabolic syndromes(WHO, 2008) measured in males and females were 85.9±8.6 (SD) cm and 82.4±9.3 (SD) cm respectively (Table 2). Similarly, the average head circumference (HC) of males and females were 93.9±6.9 (SD) cm and 95.3±8 (SD) cm separately. According to the WHO classification, males with more than 85cm of WC and females with more than 80cm of WC are at the risk of developing metabolic complications (WHO, 2008). In the present sample 26.9% of males and 26.9% of females fall into this risk category with higher WC values than the cut off values (Table 3).

Table 2. Anthropometric characteristics of the non-academic staff members of the University of Sri Jayewardenepura (USJP).

Parameter	Male		Female	
	Average ± SD	Range	Average ± SD	Range
Weight(kg)	62.1±9.8	97.4 - 46.3	55.2±11.3	98.9 -32.5
Height(m)	1.6 ± 0.1	1.78-1.53	1.5±0.1	1.72-1.37
BMI(kgm^{-2})	22.9±3.8	37.1-16.7	23.1±4.2	34.2-14.1
WC(cm)	85.9±8.6	110.8-69.4	82.4±9.3	106.6-62.6
HC(cm)	93.9±6.9	114.8 - 75.8	95.3±8.0	116.9- 77.3
WHR	0.9±0.1	1.05 - 0.81	0.9±0.1	1.02 - 0.73

SD: Standard Deviation

Table 3: Distribution of BMI, WC and WHR in different categories of the non-academic staff members of the University of Sri Jayewardenepura (USJP)

BMI				
BMI range (kgm^{-2})	Male n (%)		Female n (%)	Total n (%)
Underweight (<18.5)	7 (5.4%)		6 (4.6%)	13 (10.0%)
Normal (18.5-23.5)	35 (26.9%)		26 (20.0%)	61(46.9%)
Overweight(23.5-27.5)	22(16.9%)		20 (15.4%)	42(32.3%)
Obese (>27.5)	6 (4.6%)		8(6.2%)	14(10.8%)
WHR and WC				
	Male		Female	
WC: Normal	35	26.9%	25	19.2%
High	35	26.9%	35	26.9%
WHR: Normal	24	18.5	23	17.7%
High	46	35.4	37	28.5%

n: Frequency % :Percentage SD: Standard Deviation

Waist to Hip Ratio is also associated with the risk of the developing metabolic complications (WHO, 2004). WHO has given cut-off values for WHR separately for males (0.90) and females (0.85) with respect to vulnerability of developing metabolic complications (WHO, 2008)indicating that 35.4% of males (>0.9) and 28.5% of females (>0.85) in the present study are at the risk of developing metabolic complications.

The mean BMI of the males and females of the population was found to be 22.9±3.8 kg/m^2 and 23.1±4.2 kg/m^2 respectively in the sample. Distribution of BMI, WHR and WC among different categories are given in Table 3. BMI of the study population was classified according to the WHO classification for South Asians(WHO, 2004; Tippawan, 2011)]. No significant differences were found in BMI between males and females in the study population (p>0.05). According to the WHO classification for South Asians, 46.9% of the participants in the sample were in the normal range of BMI category (18.5-22.9 kg/m^2), while 10% of the participants were in the underweight category (BMI <18.5 kg/m^2). The majority of the participants (43.1%) were overweight and obese (>23 kg/m^2).

It was further noted that meanof weight, height, WC, and WHR between males and females (p<0.05) were significantly different and also presence of a strong positive correlations (r>0.8) between BMI and weight, BMI and HC, WC and weight, WC and HC. Moreover, participants who had sedentary life style showed a significant relationship with the participants who were overweight and obese (r=0.4, p<0.05).

3.4 Dietary Profile

All the 130 participants have completed and submitted their seven-day dietary record. Table 4 shows the mean energy and protein requirement of the participants and the respective energy and protein intakes. Energy and protein intake values were calculated based on the dietary intake over the period of seven days. Average energy requirement values of males and females were 2078 ±326.8 (SD) kcal and

1630.2±381 (SD) kcal respectively whereas corresponding average energy intake values of males and females were2732.9 ±250.7 (SD) kcal and 1695.0 ±148.5 (SD) kcal. With respect to energy requirement, both males and females had higher energy intakes. Similarly, the protein intake was also high in both males (48.5%) and females (35.4%) in comparison to the requirement. In addition a significant difference was observed in energy requirement (p<0.05), energy intake (p<0.05), protein requirement (p<0.05) and protein intake (p<0.05) between males and females and a positive relationship was observed between the participants who had higher energy intake as compared to energy requirement in overweight and obese participants (r=0.5).

Table 4. Mean energy, protein requirement and intake values of the of the non-academic staff members of the University of Sri Jayewardenepura (USJP).

	Male	Female
	Average ± SD	Average ± SD
Energy Requirement (kcal)	2078.0 ± 326.8	1630.2 ± 287.6
Energy Intake (kcal)	2732.9 ± 250.7	1695.0 ± 148.5
Protein requirement (g/day)	46.5 ± 7.4	41.4 ± 8.4
Protein Intake (g/day)	58.8 ± 11.0	47.4 ± 9.1

The average values of carbohydrate, protein and fat consumption by participants are given in Table 5. Average values of carbohydrate, protein and fat consumption of males during the seven-day period were 365.4 ±66.9 (SD) g/day, 58.8±11.0 (SD) g/day and 42.5±6.8 (SD) g/day respectively. The corresponding values in females were 270.0 ±58.2 (SD) g/day, 47.4 ±9.1 (SD) g/day and 40.7±6.9 (SD) g/day respectively. In comparison to average carbohydrate and protein consumption values of males, the RDA (Recommended Daily Allowance) values of the carbohydrate and protein consumption of females were low(carbohydrate-300g /protein-50 g per day). However, average fat consumption of both males and females was lower than the recommended values (65g/day) (Wikramanayaka, 1980). The contribution of calories from carbohydrate, protein and fat in males was 70.3%, 11.3% and 18.4% respectively whereas in females was 66%, 11.6% and 22.4% respectively. The daily intake of carbohydrates, proteins and fats were calculated based on the seven-day food record data in grams of carbohydrates, proteins and fats consumed. In the context of food records the amount of oil and coconut milk used in cooking per day were not recorded and in order to compensate that, an assumption was made that every individual consumes an average of 35 ml of coconut oil and 350 ml of coconut milk per week. This was a limitation of the study and could have been the reason for low calorie contribution from fat in males and females. Further a significant difference (p<0. 05) was observed in carbohydrate intake and fat intake between males and females.

The frequency of food consumption of participants during the week is shown in Table 6. It is evident that majority of participants fulfill their carbohydrate requirement mainly by consuming either red rice (45.4%), white rice (20%) or parboiled rice (34.6%) throughout the week. In addition string hoppers, hoppers, roti, pittu and noodles also serves as sources of carbohydrates in their diet. Frequency of consumption of string hoppers, hoppers, rotti, pittu and noodles was reported as 20.8%, 24.6%, 13.8%, 11.5% and 8% respectively. The majority consumes all the above starchy foods at least once a week. Protein requirement was fulfilled by consuming fish or dried fish during the week in addition to chicken and eggs. Consumption of fish and dried fish among the staff members during the week was 98.5% and 35.4% respectively. Most of the staff members (10%) consume eggs once a day. The daily fat requirement of the participants was fulfilled by consuming cheese (5.4%), butter (15.4%) and curd (13.8%) in addition by the daily oil intake of fried food.

Consumption of vegetables among the participants was appreciable as all of them consumed vegetables during the week and most of them (54.6%) three times a week. Consumption of fruits among the study population was not satisfactory compared to the vegetable consumption. Among the sample 74.6% of the participants consumed fruits but mostly (36.2%) twice a week.

Table 5: Average values of carbohydrate, protein and fat consumption per day of the non-academic staff members of the University of Sri Jayewardenepura

Major nutrients	Male			Female		
	Value (g/day)	Energy (kcal)	%	Value(g/day)	Energy(kcal)	%
Carbohydrate consumption	365.4±66.9	1461.6±267.6	70.3	270.0±58.2	1080±232.8	66
Protein consumption	58.8±11.0	235.2±44	11.3	47.4±9.1	189.6±36.4	11.6
Fat consumption	42.5±6.8	382.5±61.2	18.4	40.7±6.9	366.3±62.1	22.4

Table 6. Frequency of consumption of different foods among of the non-academic staff members of the University of Sri Jayewardenepura (USJP)

Food	Once a week		Twice a week		Thrice a week		>3 times per week		Total	
	n	%	n	%	n	%	n	%	n	%
White rice	-	-	-	-	-	-	26	20	26	20
Red rice	-	-	-	-	-	-	59	45.4	59	45.4
Parboiled rice	-	-	-	-	-	-	45	34.6	45	34.6
String hoppers	14	10.8	13	10	-	-	-	-	27	20.8
Hoppers	20	15.4	12	9.2	-	-		-	32	24.6
Rotti	8	6.2	7	5.4	3	2.3	-	-	18	13.8
Pittu	10	7.7	5	3.8	-	-	-	-	15	11.5
Noodles	5	3.8	5	3.8	-	-	-	-	10	8
Fish	-	-	-	-	19	14.6	109	83.9	128	98.5
Chicken	22	16.9	23	17.7	3	2.3	-	-	48	36.9
Egg	13	10	12	9.2	2	1.5	1	0.8	28	21.5
Dried fish/sprats	-	-	19	14.6	26	20	1	0.8	46	35.4
Cheese	7	5.4	-	-	-	-	-	-	7	5.4
Butter	11	8.5	9	6.9	-	-	-	-	20	15.4
Curd	11	8.5	7	5.4	-	-	-	-	18	13.8
Vegetables	-	-	50	38.5	71	54.6	9	6.9	130	100
Fruits/ Juice	25	19.2	47	36.2	24	18.5	1	0.8	97	74.6

n = Number of participants

4. Discussion

The results of this survey reflect nutritional status of university employees with regard to their physical activity level, nutritional anthropometry and the dietary profile.

Anthropometric evaluation is necessary for workers for accurate assessment of nutritional status. These measurements are also used to assess the prognosis of chronic and acute diseases (Garcia *et al*., 2007). Malnutrition and Obesity are major public health problems that are increasing worldwide both in developed and developing countries. According to the data presented in 2008 by WHO, 35% and 11% of the world adult population was overweight and obese respectively (WHO, 2008). As reported in the present study, 10%, 46.9%, 32.3% and 10.8% of the non-academic staff members were underweight, normal, overweight and obese

respectively in accordance with the WHO classification of BMI for South Asians as they have different percentage of body fats and health risks than European populations(WHO, 2004).

Regular physical activity is important to maintain the health of individuals and populations. In the present study majority (79.2%) of the staff members surveyed had a sedentary life style. Physical inactivity is one of the major factors that contribute to the development of overweight and obesity (Wareham *et al*., 2005). As reported in the present study, 10%, 46.9%, 32.3% and 10.8% of staff members are underweight, normal, overweight and obese respectively. A similar study conducted among selected Sri Lankan non-diabetic patients revealed that 6.9%, 33.1%, 19.3% and 40.7% of the patients were underweight, normal, overweight and obese respectively (Anusha, 2012). The present study show, higher percentages of staff members in the overweight category (32.3%) and a lower percentage (10.8%) of members in the obese category. That might be due to the differences in the two populations. Waist circumference and WHR are associated with the risk of the development of metabolic complications (WHO, 2004). According to a study conducted by Katulanda *et al*., (2010) in Sri Lanka, the average WC of males and females were 78.1±11cm and 76.7 ±12.1 cm and average WHR of males and females were 0.9 ±0.1 and 0.9 ±0.1 respectively. The present study showed a slightly higher average WC than the above study. However, both studies showed the same average values of WHR. This may reflect a trend in increasing obesity in Sri Lanka as seen in many other countries.

Energy and protein intake of the staff members of the present study was calculated using seven days of detailed food records. The results showed that both males and females had a higher energy and protein intakes compared to their requirement. Protein requirement vs. protein intake in males and females was 46.5g vs. 58.8g and 41.4 g vs. 47.4g respectively. In the population assessed 83.8% of the staff members had taken more protein than the requirement. Rice contributes to a significant amount of protein intake in the Sri Lankan diet. In addition milk, fish, dried fish, chicken and eggs also make a notable contribution. Most of the studies have shown that the reasons for the under or over reporting of food records are mainly due to alterations in the habitual dietary intake pattern, by limiting certain food items due to difficulties in weighing (Thoradeniya *et al*., 2012).

According to the dietary guidelines an individual should maintain 50-65% calorie intake from carbohydrates, 10-15% from proteins and 15-30% from fats (Wikramanayaka, 1980). In the present sample the contribution of calories from carbohydrate, protein and fat in males was 70.3%, 11.3% and 18.4%, respectively and in females were 66%, 11.6% and 22.4% respectively. When comparing these values with dietary guidelines, the contribution of calories from carbohydrates was higher in males (70.3%), but it is the normal in females (66%). The contribution of calories from protein was in the normal range in both males (11.3%) and females (11.6%). The contribution of calories from fat lies within the lower limit of normal range in males (18.4%). But it is in the normal range in females (22.4%).Therefore, as revealed in the present study, the main energy source of most of the workers is carbohydrates and is coming from rice. White bread, string hoppers, hoppers, pittu, rotti and noodles also provide carbohydrates but to a lesser degree. Rice is the staple food among Sri Lankans. They consume rice mostly with mixed dishes but with a larger proportion of rice compared to small portions of curries .Thus, most of the meals contain higher amount of starch than proteins, fat and other nutrients. That may be the reason for higher calorie intake from carbohydrates than proteins.

5. Conclusions

The evaluation of the nutritional status of government workers is important due to increased prevalence of work related illnesses among them. According to anthropometric data,majority of participants in the current study were overweight and obese that significantly correlates with the physical activity level of the workers. Further, most of the participants (82.3%) had higher energy intake leading to abdominal obesity. Therefore, proper awareness programs need to be developed to distribute knowledge on the risks of being overweight and obesity because of its seriousness as a future public health problem. Further, strategies should developed to improve the food quality and quantity to maintain good health and desirable weight while workers should be encouraged to engage in regular physical activity by promoting sports among different departments and occupational categories in the universities.

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