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An Analysis of Factors that Affect Food Choices of University of Zambia Students

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Abstract

The purpose of the study was to analyse factors that affect food choices of accommodated female students at the university of Zambia. The sample for the study was 249 female students selected using the proportional stratified simple random sampling technique. A questionnaire was used in collecting data. The data collected were analysed using descriptive statistics, t- test and factor analysis. The factor analysis showed that food choices could be grouped into six groups accounting for 58.765% of the variance. The average mean of 2.0180 indicated that respondents have limited Nutrition Knowledge. It was also noted that; there was no difference in Nutrition Knowledge between the young ones and the older ones. The non-vegetarians ate more food groups than the vegetarians. The vegetarians spent more time on exercise and drank more water per day. Respondents also differed in their food choices and cooking methods according to their socio-economic status. The main recommendation that emerged from the study was that Food Science and Nutrition should be added to one of the first-year core courses at the University of Zambia. In addition, outsourcing experts such as dieticians and nutritionists to address students on importance of safe clean water and good food hygiene practices would be invaluable in ensuring healthy lifestyles and enhanced academic productivity.

Keywords: *Body Mass Index (BMI), Discretionary calories, Diet, Food Choices, Nutrition, Overweight, Recommended Dietary Allowance (RDA), Students, Underweight.*

Introduction

Food choices are an important public health issue that has significant health and economic implications. People establish many of their food preferences early in life, and because they make more and more independent eating decisions as they move through adolescence, the transition to the independent living during the university days is an important event [1]. Lack of purchasing power makes some students to consume a lot of carbohydrates which increases their intake of Calories. For some, skipping meals and taking bulky food increase the storage of fat in the body [2]. This also leads them to becoming overweight or obese. However, even when the purchasing power is there, various forms of imbalances in dietary intake occur due to a lack of knowledge and the time to prepare the meals. On the other hand, some students starve themselves to maintain their shapes and wanting to appear younger. This subsequently can lead to underweight [3]. Affordability is the ability to

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bear a cost. If someone does not have the money or other resources to acquire an item, it is clearly unaffordable. Equally, if the money is available, but other things take priority in the students' budget, viewing the item as expensive, in this case, food, it may still be unaffordable [4].

The foods that we eat are important to our long-term health and well-being. This link is of particular importance to students because bad choices can lead to overweight and obese or under nutrition, which can present various health problems. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in metres). A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight. An ideal body weight range is between 18.6 and 24.9. Underweight is less than 18.5 [5]. Once considered a problem only in high-income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings [1].

Malnutrition, overweight and obesity can negatively affect the immune system, but nutritional interventions can act as immunostimulatory and help in the prevention of both communicable and non-communicable diseases [6]. Hippocrates 2, 500 yrs ago. Let food be thy medicine and medicine be thy food'', meaning that in food we can find medicine, and in the food we can find poison [7]. Therapeutic nutrition emphasis is on proper nutrient intake. Food choices can influence the nutrition status of both developed and developing countries. Covid 19 pandemic affected a lot of people seriously who had underlying factors [8]. There is a need for positive changes in dietary patterns as the world anticipates new viruses and other pathogenic micro-orgs due to human activities. Metabolism of food can be efficient if a diet is balanced because of the requirement of all nutrients in that process. With a routine of good nutrition, the body can fight pathogen causing microbes, and its appearance will also be improved.

Determinants can affect food choices. Biological determinants include hunger and appetite, which can make one to want to eat the foods available without making a proper choice. Palatability is the pleasure that someone experiences when eating a particular food. The sensory aspects include the smell, appearance, and texture of food. [9]. The social determinants are culture, family, and peers. Psychological determinants are mood and stress. Attitudes include beliefs and knowledge about food [10]. Economic determinants can result into a lack of proper choice of food. People in low-income brackets may eat carbohydrates in excess. Those in the higher Socio-economic brackets may gain weight due to eating fatty foods and carbohydrates [4]. More time is often allocated for schoolwork and less time for other activities, including eating. Lack of time to prepare meals can restrict students to unhealthy methods of cooking, such as frying, which increases the consumption of fat [10].

A high-sugar diet coupled with a sedentary lifestyle is the perfect breeding ground for non-communicable diseases. The body needs an adequate amount of water every day. Low-fat milk, soya milk is better than high-fat milk [1]. Stress can affect all body systems due to the secretion of cortisol. This secretion increases energy availability via gluconeogenesis, where glycogen is changed to glucose. The presence of cortisol also results into lower protein stores in the body, meaning that the protein in nature activities will not function well [11]. Skipping meals can lead to hunger, increasing vulnerability to eating high calorie, high fat, or sugary foods. Frequent meals of four to five times per day can help in maintaining ideal body weight. In between, snacks can consist of fruits and water [5].

According to a study published in the December 2010 issue of the Baltic Journal of Health and Physical Activity [12], underweight people have lower bone mass density. This can

lead to Osteoporosis which is characterised by bone loss, brittle bones, and increased fractures before menopause. It is also important that vegans complement incomplete proteins from the plant kingdom to make proteins of high biological value (HBV), such as the combination of legumes and cereals [13]. Research shows that, those who exercise are more likely to have less of a stress reaction to adverse situations [14].

Healthy eating beginning from childhood is the cornerstone of optimal growth and development for infants, children, adolescents and adults [15]. Whatever parents teach their children to be good food even when it is not is often taken on to adulthood if nutrition knowledge does not intervene [16] (Shaffer, 2002). Every human being should desire to be healthy. Unless health is good, no one can enjoy to the full all that life has to offer, especially in the academic sphere [17]. However, although food occupies the first position in the hierarchical needs of humans, ignorance of many basic facts relating to food and nutrition is still widespread. MyPlate food guide system was published by the Department of Agriculture in the United States (USDA) to give guidance to people, young and old on the importance of diet and its link to health and nutrition [18].

Methodology

Descriptive of the Study Area

The University of Zambia (UNZA) is a public university located in Lusaka, Zambia. It is Zambia's largest learning institution. The university was established in 1965 and officially opened to the public on 12 July 1966. It is the oldest public university in Zambia. The population of students include students coming from different socio-economic status, high, medium, and low. The institution at the time of the study had different eating places which were cooking and selling a variety of cooked foods to students. On the other hand, students have facilities in their rooms that enable them to cook and eat from their rooms.

The university consisted of nine faculties at the time of study. Eight located at the main campus, while one, the School of Medicine, at Ridge Way campus near University Teaching Hospital (UTH). University of Zambia students cook in their rooms or eat from other food outlets available on campus. A study carried out by the School of Medicine at the University of Zambia by Goma revealed that in 2011, 20.6% of male and 46.6% of female students were overweight [19]. Weight gain occurs when the intake of energy exceeds the expenditure of combined costs of basal (resting) metabolism, activity, and thermal effect of food [20]. However, if the energy intake becomes less than what is required, a person can become underweight.

Sampling

The study focused on the population of female students who resided at the institution. The entire population consisted of 1,342 female students. Out of the population of 1,342 female students residing at the main and ridgeway campuses, 20% of the students were sampled from each school using proportional stratified simple random sampling. This method ensures that all members of the population have essentially the same probability of being selected [21].

Table 1. Population and Sample of the Study

Name	**Population**	**Sample 20%**	**Sample Distribution**	
			Level of Study	**No of Sample**
School of Agriculture	48	10	Year 1	1
			2	2
			3	3
			4	2
			5	2
School of Engineering	7	2	Year 1	0
			2	1
			3	0
			4	0
			5	1
School of Law	31	6	Year 1	1
			2	1
			3	2
			4	2
School of Mines	8	2	Year 1	0
			2	0
			3	1
			4	0
			5	1
School of Natural Sciences	127	25	Year 1	7
			2	6
			3	7
			4	5
School of Medicine	176	35	Year 3	8
			Year 4	6
			5	9
			6	6
			7	6
School of Veterinary	18	4	Year 1	0
			2	1
			3	0
			4	1
			5	1
			6	1
School of Humanities and Social Sciences	360	72	Year 1	17
			2	20
			3	20
			4	15
School of Education	567	113	Year 1	27
			2	26
			3	34
			4	26
Grand Total	1,342	269		

Data Collection

Data collected for this research included primary data and field observations. A questionnaire was used to collect primary data from the 169 participants that were sampled to take part in this study. The Likert format was used because the respondents in this study have a busy schedule.

Data Analysis

A descriptive research design was used in this study. This method simply tests a group of persons to ascertain the prevailing condition in descriptive and analytical surveys (Cohen, 2000). Primary data was analysed qualitatively and quantitatively. The data was organised and coded. Then the statistical package for Social Sciences (SPSS), a package for Social Sciences, was used in the analysis of data according to the experts' advice. Descriptive statistics, factor analysis and t-test, were employed. Descriptive statistics was used for questions 1, 2 and 4, and factor analysis was used for question 3 and t- test was used for question 5.

Results

Demographic Characteristics

From Table 2, 227 (84.4%) of the respondents were between the ages of 17 and 30 years, while 42 (15.6%) of the respondents were above 30 years, showing that most of the respondents were young. This, therefore, meant that most of the students living at the main campus and Ridgeway campus were relatively young.

Table 2. Frequency Distributions according to Age

Age	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	17-30 years	227	84.4	84.4
	31 years and above	42	15.6	15.6
	Total	269	100.0	100.0

Table 3 indicates that 113 (42.0%) were from the School of Education, 72 (26.8%) were from the School of Humanities and Social Sciences, 35 (13%) were from the School of Medicine, 25 (9.3%) were from the School of Natural Sciences. The rest of the respondents from other faculties were 10 or less, indicating that most of the respondents were from the School of Education.

Table 3. Frequency Distributions according to Faculty

	Schools	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	School of Agriculture	10	3.7	3.7	3.7
	School of Engineering	2	.7	.7	4.5
	School of Law	6	2.2	2.2	6.7
	School of Mines	2	.7	.7	7.4
	School of Natural Sciences	25	9.3	9.3	16.7
	School of Medicine	35	13.0	13.0	29.7
	School of Veterinary	4	1.5	1.5	31.2
	School of Humanities and Social Sciences	72	26.8	26.8	58.0
	School of Education	113	42.0	42.0	100.0
	Total	269	100.0	100.0	

Table 4. Frequency Distributions according to Level of Study

	Years	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1st Year	51	19.0	19.0	19.0
	2nd Year	57	21.2	21.2	40.1
	3rd Year	75	27.9	27.9	68.0
	4th Year	58	21.6	21.6	89.6
	5th Year	15	5.6	5.6	95.2
	6th Year	7	2.6	2.6	97.8
	7th Year	6	2.2	2.2	100.0
	Total	269	100.0	100.0	-

Table 5 indicates that 238 (88.5 %) are non-vegetarians whilst the vegetarians are 31 with (11. 5%). Most of the respondents were, therefore non-vegetarians. However, most of the respondents were Lacto vegetarians (they take meat products), and others were Lacto- ovo polo-vegetarians (they eat chicken) or Pesco Vegetarians (they eat fish), which is recommended.

Table 6. Frequency Distributions according to Religion

	Religion	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Christian	269	100.0	100.0	100.0

All the respondents that were captured were Christians. The reason would be that Zambia is a Christian nation, and as a result, the institution might have register very few people from other religions at the time of this study.

Table 7. Distribution of Respondents by Effect of Religion on Diet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	245	91.1	91.1	91.1
	Yes	24	8.9 100.0	8.9 100.0	100.0
	Total	269	91.1		

Table 7 indicates that 245 (9.1%) of the respondent's decision of being non-vegetarians is not affected by religion, while 24 (8.9%) respondents' decision of being vegetarian is affected by their religion. The majority are, therefore, those whose decisions are independent from religion.

Table 8. Frequency Distributions according to Allergies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	196	72.9	72.9	72.9
	Yes	73	27.1	27.1	100.0
	Total	269	100.0	100.0	

Table 8 indicates that 196 (72.9%) did not have food allergies, while 73 (27.1%) had food allergies. Most of the respondents were, therefore, those without any food allergies.

Table 9. Frequency Distributions based on Income of Respondents, Parents or Guardians

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	K 1 000 000<K2 000 000	86	32.0	32.0	32.0
	K 2 000 000 <K 3 000 000	90	33.5	33.5	65.4
	K 3 000 000 <K 4 000 000	39	14.5	14.5	79.9
	K 4 000 000 <K 5 000 000	19	7.1	7.1	87.0
	Above K 5 000 000	35	13.0	13.0	100.0
	Total	269	100.0	100.0	

Table 9 shows that the highest number of 90 (33.5%) had an income of K2, 000 or less and the lowest number had an income above K5, 000. The indication is that majority of the respondents that lived at the University of Zambia campuses were in the category of low income.

Table 10. Frequency Distributions based on the Money Allocated to Food Purchase

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	K250 000 < K400	114	42.4	42.4	42.4
	K400 000 < K600	109	40.5	40.5	82.9
	K600 000 < K800	39	14.5	14.5	97.4
	K800 000 < K1 000	5	1.9	1.9	99.3
	K1 000 000 < K1 200	2	.7	.7	100.0
	Total	269	100.0	100.0	

Table 10 shows the amount of money allocated to food purchases by respondents. It revealed that 141 (42.4%) allocated K250 or less than K400,000 for food; 109 (40.5%) allocated K400 or less than K600, 39 (14.5%) allocated K600 or less than K800 while only 5 (1.9%) and 2 (.7%) allocated K800 or less than K1 000 and K1,000 or less than K1,200 respectively. It was therefore evident that most of the respondents allocated less money for their purchase of food per month which is also reflected in their income in the previous Table.

Table 11 shows the time spent by respondents in food preparations. It shows that 95 (35.3%) spent 30 minutes in food preparation, 75 (27.9%) spent 40 minutes while only 10 (3.7%) spent more than an hour in food preparation. It is evident from the Table that 73.3% of the respondents spent 40 minutes or less in their food preparations, meaning that they did not have enough time to prepare their own meals.

Table 11. Frequency Distributions based on the Time Allocated to Food Preparations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	28	10.4	10.4	10.4
	30	95	35.3	35.3	45.7
	40	75	27.9	27.9	73.6
	50	30	11.2	11.2	84.8
	60	31	11.5	11.5	96.3
	80	10	3.7	3.7	100.0

Nutrition Knowledge of Respondents

Table 12. Nutrition Knowledge, according to the Respondents

Items	Mean	Std. Deviation
How many foods from the groups (proteins, carbohydrates, vitamins) do you often eat at each meal?	2.4610	.71976
How many methods of cooking do you use in a week?	2.2119	.85283
How many times do you eat in a day?	2.9814 .8848	.78917
How many times do you exercise in a week?	.9033	1.23902
How much time do you spend exercising in minutes?	2.6654	1.10543 1.11283
How many glasses of water, 250 ml do you usually drink in a day?	2.0180	.52684
Nutritional Knowledge Average	2.4610	.71976

The descriptive statistics above shows respondents' Nutritional Knowledge measured in terms of how many food groups they ate per meal, how many methods of cooking they used, how many times they exercised in a week, how much time they spent exercising (in minutes), how many glasses of water they drank per day and the number of times they ate in a day. From the Table 12, it was evident that respondents on average, ate only 2 groups of food per meal, used 2 methods of cooking, ate 3 times in a day, exercise only about once in a week, spent only 10 minutes exercising and took about 3 glasses of water per day. The average mean of 2.0180 indicated that respondents either had limited Nutrition Knowledge or did not have enough time to utilise their Nutrition Knowledge. Moreover, most of the respondents were in the low-income brackets.

Choices of Food by Respondents

The choice of food by respondents was analysed using factor analysis. Tables 13- 19 show the results of the factor analysis.

Table 13. KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling		
Adequacy		.614
Bartlett's Test of	Approx. Chi-Square	854.247
Sphericity	Df	153
Sig.		.000

Table 13 shows the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Barlett's test of Sphericity. The KMO of .614 shows that the sample used for the study was adequate. The Bartlett's Test of Sphericity was found to be significant, indicating that the items were capable of grouping themselves into factors. The communalities of all the items ranged from .410 to .725 which is an indication that all the items in the questionnaire were valid and reliable. Factor analysis showed that the food choices by the respondents could be categorised into six groups accounting for 58.765% of variance in their food choices. The six groups are discussed below.

Table 14. Group 1 – Protein

Items	Factor Loading	Mean	Standard Deviation
Meat (size of a deck card is one piece) how many pieces per meal?	791	1.6766	88280
Chicken (pieces) how many do you eat per meal?	.782	1.2974	.69166
Fish (size of a check book is a serving) how many do you take in a day?	.661	1.2602	.77696

Variance Accounted for =13.734

Table 14 above shows that protein accounted for 13.734% of the variance in the choice of food by respondents. The factor loading for all the three items was found to be high, an indication that all three items belonged to this group.

Table 15. Group 2–Starch and Protein

Items	Factor Loading	Mean	Standard Deviation
Whole grain nshima (size of a serving spoon) per meal?	.788	1.0818	1.27285
Brown Bread (how many slices per meal)?	.786	1.6097	1.64817
Beans and similar grains (half cup are a serving) many half cups per meal?	.535	1.1413	.80259

Variance Accounted for = 12.902

Table 15 above shows that starch and protein accounted for 12.902% of the variance in the choice of food by respondents. The factor loading for all three items were found to be high, an indication that all the items belonged to this group.

Table 16. Group 3 – Fats and Protein

Items	Factor Loading	Mean	Standard Deviation
Milk, tick the one often used (250 ml per serving) how many cups do you drink? Low fat Full fat as above	.839	.4572	.83478
Non-fat as above	.712	.6952	.82635
Total	.431	.4535	.68204

Variance Accounted for =11.109

Table 16 shows that fats and protein accounted for 11.109% of the variance in the choice of food by respondents. The factor loading for all three items were found to be high, an indication that all the items belonged to this group.

Table 17. Group 4 – Starch and Protein

Items	Factor Loading	Mean	Standard Deviation
White bread (how many slices per meal)?	.832	3.0297	1.25449
Grains (refined) Nshima, how many lumps per meal? (Size of a serving spoon)	.616	2.3680	.82986
Peanut Butter, how many teaspoons full do you use per meal?	.477	1.6245	1.01680
Fruits (half cup is size of a baseball, how much do you eat per day)?	-.427	.9554	.99526

Variance Accounted for = 7.877

Table 17 shows that fats and protein accounted for 7.877% of the variance in the choice of food by respondents. The factor loading for the two items were found high, an indication that they belonged to this group. Fruits revealed a negative factor loading of -.427, showing that they were not directly related to this group.

Table 18. Group 5 – Eggs (Protein)

Items	Factor Loading	Mean	Standard Deviation
Eggs, tick the size often eaten (small) how many per meal?	.679	1.4126	.82678
Medium as above?	.594	1.3866	.74260
Large as above?	.786	.7918	.59957

Variance Accounted for =7.004

Table 18 above shows that the protein group accounted for 7.004% of the variance in the choice of food by respondents. The factor loading for all three items were found to be high, an indication that all the items belonged to this group.

Table 19. Group 6 – Fats and Vitamins

Items	Factor Loading	Mean	Standard Deviation
Margarine (teaspoon levelled) how many do you use per meal?	.798	1.2305	.92581
Vegetables (half cup is half of a baseball) how much do you eat per day?	-.455	1.5204	.65545

Variance Accounted for = 6.139

Table 19 shows that the fats and vitamins group accounted for 6.139% of variance in the choice of food by respondents. However, -.455 shows that the vegetable group was not directly related to this group.

Factors affecting Respondents' Choices of Food

The factors that affected food choices of respondents were age, vegetarianism, and Socio-economic status. Tables 20- 24 is showing the t-

test analysis for the differences in respondents' Nutrition Knowledge and food choices according to age, vegetarianism, and Socioeconomic status.

Table 20. t- test Analysis for Differences in the Choice of Food among Age Groups

Item	Groups (Age)	Mean	Mean difference	t-value	Sig.
White bread (how many slices) per meal	17 – 30 years	2.9625	-.43381	-2.240	.028
	Above 30 years	3.3953			
Chicken (pieces) how many do you eat per meal?	17 – 30 years	1.3205	.52982	5.029	.000
	Above 30 years	.7907			
Fish (size of a check book) how many do you eat per meal?	17 – 30 years	1.3526	.30605	2.168	.034
	Above 30 years	1.0465			
Margarine (teaspoon levelled) how many do you use per meal?	17 – 30 years	1.4423	.48882	3.343	.001
	Above 30 years	.9535			
Non-fat milk	17 – 30 years	.5385	.28265	2.983	.004
	Above 30 years	.2558			
Large eggs	17 – 30 years	.8526	.27117	2.671	.009
	Above 30 years	.5814			

Table 20 above is showing significant differences in food choices by respondents according to age in the items listed. It was evident from the Table that older respondents ate more white bread than the younger ones, while the younger ones ate more of other food items which were essentially protein in nature. This might have been due to the fact that younger people needed more bodybuilding foods. The other reason may have been because younger ones always wanted foods that were palatable to their tongues- in this case, protein foods.

Vegetarianism

Table 21 is showing the differences in Nutrition Knowledge of respondents according to whether they were non-vegetarians or vegetarians. The three items on Nutritional Knowledge showed a significant difference between non-vegetarians and vegetarians. The Table revealed that the non-Vegetarians ate more food groups than the vegetarians. The vegetarians spent more time on exercise and drank more water per day.

Table 21. t- test Analysis for Differences in Nutritional Knowledge according to Vegetarianism

Item	Groups	Mean	Mean difference	t-value	Sig.
How many foods from the groups (proteins, carbohydrates, vitamins) do you often eat at each meal?	Non-Vegetarian	2.4874	.22933	2.016	.050
	Vegetarian	2.2581			
How much time do you spend exercising in minutes?	Non-Vegetarian	.8361	-.58322	-2.514	.017
	Vegetarian	1.4194			
How many glasses of water, 250ml do you usually drink in a day?	Non-Vegetarian	2.6134	-.45107	-2.157	.037
	Vegetarian	3.0645			

Table 22 is showing the differences in food choices of respondents according to whether they were non-vegetarian or vegetarians. The t values were all found to be significant. The Table revealed that Vegetarians ate more whole grain nshima, brown bread, cereals, beans, peanut butter, and vegetables. They also exercised more and drank more water. The Non-Vegetarians on the other hand ate more meat, chicken, and fish than their counterparts.

Table 22. t- test Analysis for Differences in Food Choice according to Vegetarianism

Item	Groups	Mean	Mean difference	t-value	Sig.
Whole grain nshima	Non-Vegetarian	1.0000	-.70968	-3.238	.002
	Vegetarian	1.7097			
Brown Bread (how many slices) per meal	Non-Vegetarian	1.4706	-1.20683	-4.248	.000
	Vegetarian	2.6774			
Vegetables (half cup is half of a baseball) how much do you eat per day?	Non-Vegetarian	1.4538	-.57848	-3.576	.001
	Vegetarian	2.0323			
Meat (size of a deck card is one piece) how many pieces per meal?	Non-Vegetarian	1.8319	1.34806	7.067	.000
	Vegetarian	.4839			
Chicken (pieces) how many do you eat per meal?	Non-Vegetarian	1.4244	1.10179	8.375	.000
	Vegetarian	.3226			
Fish (size of a check book) how many do you eat per meal?	Non-Vegetarian	1.3613	.87747	5.740	.000
	Vegetarian	.4839			
Beans and similar grains (half cup are a serving) how many half cups per meal?	Non-Vegetarian	1.0672	-.64245	-3.244	.003
	Vegetarian	1.7097			
Peanut butter, how many teaspoons full do you use per meal?	Non-Vegetarian	1.5420	-.71605	-3.384	.002
	Vegetarian	2.2581			
Cereals (half cup a serving) how many half cups per meal?	Non-Vegetarian	1.5924	-.79466	-3.406	.002
	Vegetarian	2.3871			

Table 23 is showing the differences in Nutrition Knowledge of respondents according to their Socio-economic status. The t value shows that all the four items are significant. Socio-economic status was grouped as low and high. Respondents in the high economic brackets take more food groups, use more cooking methods, eat more than three times in a day and drink more water. It means that this group spreads their food in a day and takes more water for the proper functioning of the body.

Table 23. t- test Analysis for Differences in Nutritional Knowledge according to Socio- economic Status

Item	Groups	Mean	Mean difference	t-value	Sig.
Food from the groups (proteins, carbohydrates, vitamins)	Low	2.3097	-.26078	-3.152	.002
	High	2.5705			
Methods of cooking used each week?	Low	2.0000	-.36538	-3.506	.001
	High	2.3654			

Eating times per day?	Low	2.8673	-.19685	-2.155	.032
	High	3.0641			
Glasses of water per day (250 ml)	Low	2.3894	-.47600	-3.710	.000
	High	2.8654			

Table 24. t- test analysis for Differences in Food Choice according to Socio economic Status

Item	Groups	Mean	Mean difference	t-value	Sig.
Grains (refined) Lumps of nshima (size of a serving spoon) per meal	Low	2.2389	-.22260	-2.251	.025
	High	2.4615			
Whole grain nshima as above	Low	.7434	-.58356	-3.902	.000
	High	1.3269			
Brown Bread (how many slices) per meal?	Low	1.2301	-.65453	-3.313	.001
	High	1.8846			
Fruits (half cup is half of a baseball, how much do you eat per day?	Low	.6814	-.47243	-4.002	.000
	High	1.1538			
Vegetables (half cup is half of a baseball) how much do you eat per day?	Low	1.3805	-.24126	-3.007	.003
	High	1.6218			
Beans and similar grains (half cup are a serving) how many half cups per meal?	Low	.9469	-.33515	-3.639	.000
	High	1.2821			
Low fat milk, how many 250ml per day?	Low	.3451	-.19333	-1.993	.047
	High	.5385			
Alcohol	Low	.3274	-.19180	-2.050	.041
	High	.5192			
Cereals (half cup a serving) how many half cups per meal?	Low	1.4602	-.38598	-3.319	.001
	High	1.8462			
Medium eggs, how many per meal?	Low	1.2743	-.19361	-2.136	.034
	High	1.4679			

Table 24 is showing the differences in food choices of respondents according to their Socio-economic status. The Table shows that the t values were significant.

The Table also revealed that the respondents from the high Socio-economic brackets chose all the food items, including alcohol, more than their counter parts from the low Socio-economic brackets. This could have been because money can buy more food and a variety of cooking equipment, thus increasing the number of cooking methods for those in the high Socio-economic brackets.

Discussion

The study revealed that there was no difference in Nutrition Knowledge between the young ones and the older ones, although in terms of food choices, younger people took more protein than the older ones. Older respondents ate more white bread than the younger ones. The Non-Vegetarians ate more food groups than the vegetarians. The vegetarians spent more time on exercising and drink more water per day. They also ate more whole grain nshima, brown bread, cereals, beans, peanut butter, and vegetables. The Non-Vegetarians, on the other hand, ate

more meat, chicken, and fish. Respondents in the high economic brackets ate more food groups, used more cooking methods, ate more than three times in a day and drank more water. It meant that this group spread their food in a day and drank more water for the proper functioning of their bodies. Respondents from the high Socio-economic brackets chose all the food items, including alcohol, more than their counter parts from the low Socio-economic brackets.

The students' food choices were not in line with My Pate food guide under the United States Department of Agriculture, which encouraged everyone to eat more vegetables as compared to protein and starch to meet the dairy nutritional needs. Non-fat milk and low-fat milk were to be preferred in order to maximise the benefit of calcium. Oils such as margarine were to be taken in moderation, which is one level teaspoon per day. The study revealed that more protein and starch were eaten than fruits, vegetables and whole-grain cereals, roller meal and brown bread. The time that was commonly used for preparation was not enough to cook food using boiling or stewing methods. Stress and bad mood made most of the respondents that were captured to skip meals and later ate a lot of food at once. The exercise was found to be rare among the respondents, and those that exercised did it once in a week and spent an average of 10 minutes at each session which was below the standard of exercising.

The average mean of 2.0180 indicated that respondents either had limited Nutrition Knowledge or did not have enough time to utilise their Nutrition Knowledge. Moreover, most of the respondents were in the low-income brackets. Nutrition knowledge is related to food choices, and therefore Food Science and Nutrition should be added to one of the first-year core courses at the University of Zambia. The other alternative can be that of inviting dieticians and nutritionists to address students in their schools on healthy living, which includes regular exercises, the importance of water as well as sanitation and hygiene.

Conclusion

Overweight or obesity and underweight both have detrimental effects. There is no need to wait for a major breakthrough in order to reduce the epidemic of especially being overweight and obese. Many preventable diseases have affected a lot of people around the world. Students at the University of Zambia are not an exception. The many years that students are exposed to bad eating habits and poor choices of food can expose them to such diseases. Food has therefore been identified as one of the major killers if not well utilized. A balanced diet can help students to increase their energy levels, promote a functioning immune system and improve their ability to cope with stress as well as increase concentration and performance in class.

Recommendations

1. A nutrition course can be included in the first year of study in universities in order to guide students on food.
2. Consuming unsaturated fats (found in avocado, fish, nuts, soy, olive oil) rather than saturated fats (found in butter, fatty meat, and high-fat snacks).
3. Drinking 6–10 glasses of water every day for the benefit of transporting nutrients in the blood, getting rid of waste, and regulating the body temperature.
4. Avoiding fizzy and carbonated drinks which contain too much sugar.
5. Eating a variety of fruit, fresh vegetables, 2.5 cups of vegetables (5 servings) legumes. Avoiding salty, fatty, and high sugar foods (Whitney & Rolfe, 2005).
6. Eating whole grains and nuts, 180 g of grains (unprocessed maize, oats, wheat, millet, brown rice, or roots such as yam, potato, taro, or cassava) depending on where they are coming from.
7. Eating more of white meat than red meat.
8. Using right methods of cooking for different foods to maximise nutrient intake.
9. Maintaining a healthy lifestyle of exercise, meditation, and regular sleep.

10. Avoiding too much alcohol consumption which contributes to becoming overweight.
11. More research can be done in different countries, which should be based on the local foods that can be classified in different categories in order to provide guidance on Food Choices. Food-Based Dietary Guidelines, and Technical Recommendations through the MOA was launched last year in Zambia through the support of FAO and co-funded by The European Union.

Conflict of Interest

We declare that we do not have any conflict of interest.

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