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Factors Affecting Nutritional Attitudes among University Adults

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Abstract

The problem of malnutrition has never been good and the information regarding nutrition would be advantageous particularly in case of Pakistan because significant progress of nutrition awareness at regional level is scarce. The focus of this study is to assess the nutritional believes, practice, awareness and participation of university adults towards nutrition. A cross-sectional data on 756 university students was taken. The multivariate regression models are used to find the most significant variables that influence the adult's attitudes of nutrition awareness. The results revealed that nearly 70 per cent of the adults have no regular meal routine per day. Three types of multivariate models (nutritional awareness, obesity index, meal trait) of nutritional attitudes are estimated. Across three models, males are about two times more obese than female adults. Meal trait has a strong effect on nutritional awareness. This study suggests that the significant factors that may affect nutrition attitudes are gender, district of campus, exposure of cardiovascular diseases, knowledge of diabetes, fat level awareness, obesity and meal trait. It is expected that this study would provide nutritional status of adults which is scarce at regional level in Pakistan.

Keywords: obesity index, meal trait, nutrition, nutritional attitude, hazard ratio.

1. Introduction

Nutrition plays a significant role in the development of human life. It is an essential element for development of full physical and mental potential of an individual. The Lack of balanced food and its unavailability leads to malnutrition, which affects individuals' health, intellectual maturity, labor productivity and consequently socio-economic development of the country (Shabir 2008). Nutrition knowledge with a local food mix varies geographically over the globe. The insufficient knowledge of nutrition could increase the level of malnutrition in the society. It is well known in the literature that dietary habits are formed and fixed in the school ages of individuals (Hertzler 1983, Chang and Kim 2006, Choi et al. 2008). Dietary knowledge and habits is more than just understanding meals in terms of calories and would not established in short period of time indeed a long period of learning starting at home, then school and subsequently in

the society. The culture, religion, education level, family members, socioeconomic status would have an effect on dietary behavior. It could be safely argued that dietary knowledge is one the pre requisite for dietary habit. Nutrition education is particularly the one major way out of many to spread the dietary knowledge in the society. The socioeconomic development has divided the globe mainly in developed and developing world. The case of developing world is an interest this time with a particular focus on Pakistan in which the non-biological aspect of nutrition is lacking. Although the problem of malnutrition has been never good throughout the history but the current situation is alarming in Pakistan because at regional level did not make any significant progress in reducing malnutrition since many years.

Substantial quantitative explorations about nutrition at regional level is acutely scarce; however, qualitative attempt on the infant nutrition in North-West region of Pakistan suggested the nutritional development program in Pakistan (Dykes et al. 2012). Longitudinal modeling was used to explore the enhanced nutritional interventions through Lady Health Workers program among the children under 5 years of age living in rural Sind region of Pakistan (Yousafzai et al. 2014). Siddiqui (2013) suggested the nutrition education in the school curriculum of children aged 8-10 years enrolled in 22 schools of different localities in Lahore. Based on 10 household interviews in rural Sindh Puett and Guerrero (2015) found the knowledge of malnutrition as a key barrier of childhood severe acute malnutrition. Thus it is timely needed and necessary to study factors influencing nutrition knowledge, attitude and dietary behavior among adults belonging to the region of Southern Punjab.

To the best of our knowledge adults nutrition practices have not been statistically assessed at Southern Punjab region of Pakistan. Thus this study bridge the research gap in literature in understanding the nutrition issue in Pakistan. Through regression modeling this study was aimed to investigate anthropometric measurements, nutrition knowledge, attitude and dietary behavior in the university graduates of Pakistan to understand their general condition of dietary lifestyle, and to study the relationship among variables such as nutrition knowledge, attitude and dietary behavior and to provide a guideline for nutrition education at the pre-university level.

2. Subjects and Methods

The survey was performed on a sample of 756 out of total of 12719 (7199 males and 5520 females) students for academic year 2009-2010 in the five campuses of the Islamia University of Bahawalpur (IUB) located in the three main districts (Bahawalpur, Bahawalnagar and Rahim Yar Khan) of Pakistan. A simple random sample design formula was used to calculate the sample size with 95% confidence level along with confidence limit of 3 (Lohr, 2009 p.47). Through the formula sample size of 985 was calculated; however, 756 complete questionnaires were included in the analysis of the present work. The data was collected using a survey questionnaire. A pilot testing of questionnaire was performed by distributing it 30 students, and then on the feedback some modifications were incorporated in the final version of the questionnaire. From the pilot group 15 students have good knowledge of nutrition when compared to remaining 15 students to address the construct validity of the instrument. The two groups were

found to be significantly different (P-value < 1%) in terms of ratings the nutrition items. The survey questionnaire was composed of 12 question items on nutritional awareness of the subjects, 12 items health problems related to nutrition and dietary habits, 13 items on health consciousness on dietary habits, and 6 items on basic general and demographic characteristics. Alpha Cronbach method was used to obtain reliability of questionnaire. Overall, reliability analysis yielded a high Cronbach alpha value of 0.81. The survey was performed in April-June of 2010. The 756 questionnaires with complete answers were used for the analysis of the present study.

Bivariate and multivariate statistical procedures were used to study the factors affecting attitudes towards nutrition. For multivariate modeling keeping in view the nature of outcome variables, three binary logistic regression models are estimated. Nutritional awareness is used as the outcome variable in the first multivariate model. For the second multivariate model (obesity index model) following dependent variable is used: body mass index $\leq$ 18.5 being "undernourished" and > 18.5 being classified as "adequately nourished." Daily meal trait is used as the outcome variable in the third multivariate model. Following independent variables are used for the modeling: gender, age (in completed years), program of study, district of campus, awareness of disease for low intake of food including intake of extra sugar and salt and fat.

2.1 Meal Routine

Based on three survey questionnaire items regarding three meals per day, meal routine trait is computed. Any single meal was classified under three categories: regular, casual and never. One meal trait is calculated using on at least two regular or casual (or combination of both) meals per day. Table 1 presents meal traits of adults sampled in this study. According to the meal trait nearly 70 per cent of the adults have no regular meal routine per day. For regression modeling, the response variable using meal traits is whether or not an adult in the survey made a positive statement that at least two meal traits provide a support for regular meal per day and would be considered as the binary response.

Table1: Meal Routine Trait of University Adults in Pakistan

Meal Routine Trait	**Size**	**%**
No Meal Routine Trait	329	43.5
One Meal Routine Trait	177	23.4
Two Meal Routine Traits	140	18.5
Three Meal Routine Traits	110	14.6
Total	**756**	**100.0**

2.2 Nutritional Awareness

Based on the survey questionnaire, question items for nutritional awareness were composed of a total of six items. Responses were classified as either ‘yes’ (score 2), or ‘no’ (score 1). A score of 2 was assigned on a yes on any of the six items for nutrition awareness, thus a total of 12 point score for any subject would provide his/her complete

awareness. Recognized nutritional awareness was the sum at least of five yes responses (score of 10) responses to all items and this would classify the positive statement whether adult has nutritional awareness of not.

3. Results

Table 2 shows the results of bivariate analysis of factors which may be potentially related to three outcome variables: nutritional awareness, obesity index and meal trait.

As expected there was a gender differential in obesity but no statistical difference is observed in nutrition awareness and meal trait between male and female adults. Students of Golistan Province in Iran showed strong significant gender difference on nutrition awareness (Barzegari 2011). There is no effect of program of study on any of the nutritional attitudes. There exist a strongly significant geographic proximity over the nutritional attitudes—adults from three districts significantly differ on nutrition behavior. Adults seen to have well understanding about low consumption of food compared to obesity. Awareness about consumption of extra sugar is more pessimistic compared to intake of salt. Obese or adequately nourished adults have little awareness of disease related to fat compared to non-obese adults.

In order to assess the joint significance of all independent factors multivariate logistic regression models on three nutritional attitudes (Model 1: nutritional awareness, Model 2: obesity index, Model 3: meal trait) are shown in Table 3. Table 3 presents the estimated regression coefficients with hazard ratios of three models. Hazard ratio is simply the exponential of estimated coefficient value. For the reference category of each variable, the hazard ratio is assumed to be fixed at 1.00 (hazard ratios for reference categories are not shown in tables). A hazard ratio greater (or less) than 1.00 indicate a higher (or lower) likelihood of in that category as compared with that of the reference category.

Table 2: Bivariate Analysis of Nutritional Attitudes among University Adults According To Various Characteristics

Characteristics	Nutritional Awareness		Obesity Index		Meal Trait	
	No	Yes	UN	AN	No	Yes
Gender						
Female	152	241	198	195	265	128
Male	124	239	127	236	241	122
Chi Square-Statistic (P-Value)	1.66 (0.20)		18.25 (0.00)		0.09 (0.76)	
Age (Years)						
Less than 18	18	17	10	25	30	5
18-24	243	432	301	374	450	225
25+	15	31	14	32	26	20
Chi Square-Statistic (P-Value)	3.74 (0.15)		6.64 (0.04)		7.85 (0.02)	
Program of Study						
Undergraduate	96	182	120	158	190	88
Graduate	156	258	173	241	268	146
Postgraduate	24	40	32	32	48	16
Chi Square-Statistic (P-Value)	0.74 (0.69)		1.53 (0.47)		3.04 (0.22)	
District of Campus						
Bahawalpur	260	321	258	323	418	163
Bahawalnagar	4	71	19	56	43	32
Rahim Yar Khan	12	88	48	52	45	55
Chi Square-Statistic (P-Value)	74.39 (0.00)		11.04 (0.00)		31.45 (0.00)	
Awareness of Disease Related to Low Intake of Food						
No	260	288	248	300	403	145
Yes	16	192	77	131	103	105
Chi Square-Statistic (P-Value)	102.79 (0.00)		4.17 (0.04)		39.31 (0.00)	
Diabetes Awareness Status						
No	254	213	213	254	356	111
Yes	22	267	112	177	150	139
Chi Square-Statistic (P-Value)	168.52 (0.00)		3.42 (0.06)		47.74 (0.00)	
Disease Related to Salt Intake						
No	248	211	204	255	352	107
Yes	28	269	121	176	154	143
Chi Square-Statistic (P-Value)	154.76 (0.00)		1.01 (0.32)		50.26 (0.00)	
Awareness of Disease Related to Fat						
No	246	176	185	237	321	101
Yes	30	304	140	194	185	149
Chi Square-Statistic (P-Value)	195.58 (0.00)		0.28 (0.60)		36.01 (0.00)	

UN: undernourished AN: adequately nourished

Table 3: Logistic Regression Estimates of the Factors Associated With Nutrition Attitudes of University Adults (Sample Size 756)

Characteristics	Model 1 (Nutritional Awareness) Coefficient (SE)	HR	Model 2 (Obesity Index) Coefficient (SE)	HR	Model 3 (Meal Trait) Coefficient (SE)	HR
Gender						
Female (Reference)						
Male	0.14 (0.23)	1.15	0.63** (0.16)	1.87	0.17 (0.19)	1.19
Age (Years)						
Less Than 18 (Reference)						
18-24	0.39 (0.50)	1.48	-0.63 (0.39)	0.53	0.81 (0.54)	2.24
25+	0.33 (0.69)	1.39	-0.11 (0.51)	0.89	1.29* (0.63)	3.62
Program of Study						
Undergraduate (Reference)						
Graduate	0.15 (0.24)	1.16	0.15 (0.17)	1.16	0.36 (0.19)	1.43
Postgraduate	0.56 (0.41)	1.76	-0.32 (0.29)	0.73	-0.15 (0.36)	0.86
District of Campus						
Bahawalpur (Reference)						
Bahawalnagar	3.20** (0.56)	24.45	0.73* (0.31)	2.08	0.05 (0.29)	1.05
Rahim Yar Khan	1.14** (0.39)	3.14	-0.07 (0.24)	0.93	0.68** (0.25)	1.98
Disease Related to Low Intake of Food						
No (Reference)						
Yes	0.51 (0.35)	1.67	0.26 (0.21)	1.29	0.41 (0.22)	1.50
Diabetes Awareness Status						
No (Reference)						
Yes	1.10** (0.40)	3.01	0.26 (0.27)	1.30	0.01 (0.28)	1.01
Disease Related to Salt Intake						
No (Reference)						
Yes	0.21 (0.38)	1.24	0.03 (0.25)	1.03	0.42 (0.26)	1.52
Awareness of Disease Related to Fat						
No (Reference)						
Yes	2.00** (0.30)	7.39	-0.03 (0.22)	0.97	-0.18 (0.23)	0.83
Nutritional Awareness						
No (Reference)						
Yes	Not Applicable		0.10 (0.21)	1.11	2.10** (0.28)	8.18
Obesity Index						
Undernourished (Reference)						
Adequately Nourished	0.02 (0.22)		1.02	NA	-0.71** (0.19)	0.49
Meal Trait						
No (Reference)						
Yes	2.04** (0.29)	7.69	-0.68** (0.18)	0.50	Not Applicable	
Intercept	-2.01** (0.55)	0.13	0.45 (0.41)	1.57	-3.29** (0.60)	0.04

*0.05>*p*R0.01; **p<0.01.
SE: Standard Error
HR: Hazard Ratio

Across three models, males are about two times more obese than female adults. There was a strong association between nutritional awareness and district of campus (Model 1). The result in interesting to note: adults who belong to district Bahawalnagar were about twenty four times as likely to have nutrition awareness as were from Bahawalpur. It is converse from expectation because Bahawalpur is socio-economically more developed district than Bahawalnagar. Disease awareness regarding low intake of food and salt revealed to be insignificantly effecting on all three models. Adults who have awareness of fat related disease and have attitude of regular meal are about seven times advanced in nutrition awareness than adults who have no regular meal behavior per day (Model 1). Globally, age is found to be major determinant of nutrition (McLean-Meyinsse et al. 2017). In the present study, adults aged twenty five or above have about three times as likely to have regular meal than adults less than twenty five (Model 3).

4. Discussion

Adults of both sexes in all income or cultural or racial or ethnic groups can be at risk for dietary deficiencies and excesses. Previous research shows that consumption and behaviour of food is different in boys and girls (Ahmed et al. 1998, Li et al. 2010, Barzegari et al. 2011, Morawska et al. 2016). The findings in this study suggest that there is no great variation in the degree of nutrition awareness according to gender exhibited by university adults. But a great gender variation is found on obesity. The results are directly comparable in a similar setting of university graduates in Louisiana where the obesity rates risen steadily from 1996 through 2016 (McLean-Meyinsse et al. 2017).

Diabetes is a chronic condition, in which there is a high blood glucose level in the blood as results of the body instability. Diabetes have long been linked to obesity or being overweight and the research the Harvard school of Public Health showed the single key predictor of type II diabetes is being obese (Abiba et al. 2012). Model for nutritional awareness in this study predicts that adults who are aware of diabetes are three time more likely to have nutrition awareness than were not aware to diabetes. In Nigeria, a study conducted by (Olumakaiye et al. 2010) on food consumption patterns of Nigerian adolescents and effects on body weight to determine the association between nutritional status of adolescents and food consumption pattern showed that more than half of the participants ate three meals daily. In our study, there are great variations found in the degree of meal trait. Meal trait has a strong effect on nutritional awareness model. For example, the nutritional awareness model predicts that those adults who have regular meal trait are seven times more likely to have nutrition awareness than those adults who have no meal trait.

5. Conclusion

In this study, adult's attitude and participation towards nutrition were explored statistically using 756 students currently studying in The Islamia University of Bahawalpur. It is expected that this study would provide some on the nutritional status of adults which is scarce at regional level in Pakistan. Logistic regression modeling analysis suggests that the significant factors that may affect nutrition attitudes gender, district of campus, exposure of cardiovascular diseases, knowledge of diabetes, fat level awareness, obesity and meal trait. Historically, the nutritional surveys in Pakistan are scarce, for

example in the last three decades only three nutrition surveys at national level were conducted (*National Nutrition Survey Pakistan* 2011, *National Nutrition Survey Pakistan* 2001-02, *National Nutrition Survey Pakistan* 1985-87); so the information generated in this article would help the policy makers to adopt the effective strategies for the investment towards regional nutritional programs or surveys.

6. Limitation and Future Directions

The study is limited to a sample from region of Southern Punjab. The issue of nutrition may need to be explored in other regions and for a national level to make necessary policy inputs in Pakistan. Owing to limited nutrition studies in Pakistan particularly at regional level and the importance of promotion of nutrition knowledge and attitude for keeping the society healthy, further studies on this area seem necessary.

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