SOCIO DEMOGRAPHIC INFLUENCE ON PRACTICE OF DIETARY BEHAVIOR AMONG ADOLESCENTS

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ABSTRACT

Background: As we know that due to stationary life style and altered eating habits there are certain threats to health of adolescents. This study assesses the relationship between social demographic influence on eating behaviors and its impact on health among the adolescent boys as the kingdom of Saudi Arabia has adopted western style in respect of their routine meals.

Materials and Methods: A cross sectional study was conducted among 375 male adolescents aged between 12 to 21 years. A self-administered questionnaire was used which included questions on socio-demography, awareness of eating habits and life style. Categorical variables were compared by using the Chi-square test. Independent t-test was applied for comparison between the groups. Data were analyzed by SPSS 20.1v.

Result: According to the BMI classification, it has been found that 50.14% subjects were unhealthy. We found that urban and rural area doesn't have any relation (p 0.05) with the rate of awareness among studied subjects. There is sufficient evidence of association (p 0.05) between the level of education and awareness of the food habits. There is no significance (p = 0.259) between level of schooling and BMI of students, while the association (p = 0.001) between the level of schooling and waist circumference has been noticed.

Conclusion: Study deduced that different social factors do have effects on the eating behavior of studied population. Unhealthy and fast lifestyle altered the eating pattern of adolescents and affected their health status. Though, the efforts to educate adolescents and increase awareness can make a positive change to promote health and developments of adolescents.

Key words: Adolescents, Eating behavior, Knowledge, Nutrition, Puberty, Social influence

1.0 Introduction

Adolescence, the transition from childhood to adult life, is one of the most rapid phases of physical growth. One-third of all the growth in a life time occurs during this stage. Adolescence starts with the onset of puberty (Butte et al,. 2007). Adolescence can be divided into three stages.(i) Early adolescence (11-14 years of age) is characterized by the onset of puberty and increased cognitive development. (ii) Middle adolescence (15-17 years of age) is characterized by increased independence and experimentation. (iii) Late adolescence (18-21 years of age) is a time for making important personal and occupational decisions. Adolescence is considered as nutritionally critical period of life for several reasons (Hayat Saeed st al., 2008). Firstly the growth is faster than at any other time in individual's life. Eating behavior has undergone a gradual and continuous process of change over the years as a result of modernization, urbanization and industrialization.

Puberty is a period of several years in which rapid physical growth and psychological changes occur, culminating in sexual maturity. The average age of onset of puberty is at 11 for girls and 12 for boys. Every person's individual timetable for puberty is influenced primarily by heredity, although environmental factors, such as diet and exercise, also exert some influences .These factors can also contribute to precocious and delayed puberty.

Unhealthy eating behavior and attitudes may lead to nutritional deficiencies because food intake is likely to be deviated from recommended level of nutrients. Adolescents are very sensitive to inadequate eating behavior. The adolescents, whose balanced diets are lacking in nutrients which are necessary for growth and development, fail to reach their optimum growth potential (Cole TJ et al., 2007). The problem of unhealthy weight appears to be increasing with affluence, urbanization and industrialization resulting in sedentary life style and abundant availability of food. (Lokeman, Rhonda Chriss, 1999).

The FDA has proposed a number of actions to address the problem of unhealthy eating behaviors. Among these recommendations, nutritional education among adolescents should be encouraged to promote healthier eating habits and lifestyles, as well as adherence to the healthier traditional food. Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth. Proper eating behavior is also important during this time to help prevent adult diet-related chronic diseases, such as cardiovascular disease, cancer, and osteoporosis (WHO/EMRO, 2006).

2.0 Materials and Methods

This cross-sectional study was conducted with 375 adolescent's students studying in the different government schools in the Khamis-Mushait. Among 63 higher and secondary schools we randomly selected 5 schools as our clusters and made our sample frame from these schools. We took all the students attaining age from 12 to 21 as our subjects. A self-administered questionnaire was used which included questions on socio-demography, eating habits life style and awareness.

After arrangement with principals of the respected schools, students from the age 12 to 21 were approached in the classrooms after lectures. They were asked to participate in this study

voluntarily. Objectives and benefits of the study were explained to respondents orally and in a written format attached to the questionnaire. A written consent was obtained from those who agreed to participate. Approval of the study was obtained from the/departmental committee of the University

A previously pretested validated questionnaire was used to collect the data. Categorical variables were expressed as numbers and percentages, and analyzed using a chi-square test. Continuous variables were expressed as means and standard deviations; all reported p values were made on the basis of two-tailed tests. Differences were considered statistically significant at p 0.05. The Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 20.1 was used for data analysis.

3.0 Study instruments

After the literature review and discussion with the experts we prepare a self-administered questionnaire. The questionnaire consisted of four parts. The first part included questions on socio-demographic data; such as age, gender, education level, and living circumstances, mother's education, family income etc. Body Mass Index (BMI) was calculated after the collection of weight and height of the respondents. The second part of the questionnaire questions on eating habits and type of meals consumed such as frequency of meals, type of meal, vegetables and fruits consumption, daily water intake, consumption of fast food, etc. The third part included questions on life style that influenced health status of the respondents. The last part the questionnaire was about the awareness of food products and their impacts on health. Most of the responses were measured in the form of Likert scale. All the questions which have been considered were adequately reliable with Cronbachs Alpha of 0.76.

4.0 Result

The study sample comprised 375 students' males. The students were from government schools. They were at the intermediate and secondary from 7 to 12 grades. Anthropometry measurements of the studied sample of adolescents are presented in table 1.

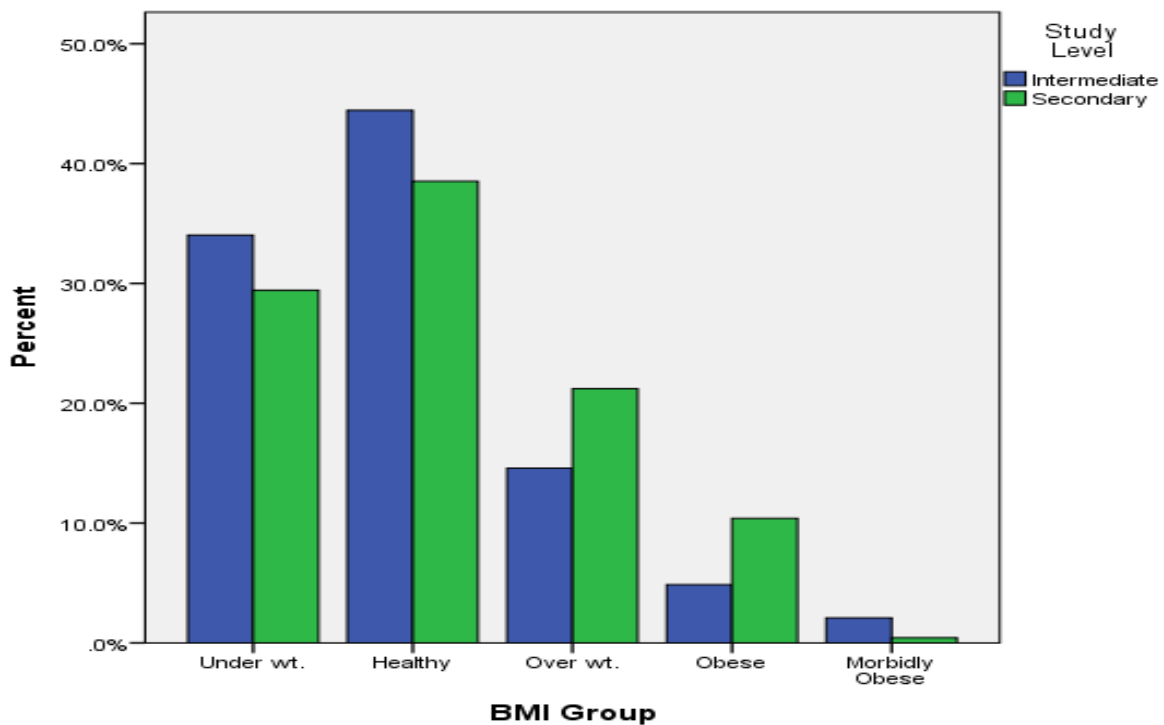| **Table 1:** Descriptive Statistics						
Variables	N	Range	Minimum	Maximum	Mean	Std. Deviation
Age	375	9	12	21	16.11	1.891
Height in cm's	375	71	120	191	161.88	13.000
Weight in Kg's	375	95	25	120	59.27	16.558
BMI (Kg/m^2)	375	59	14	73	22.55	5.539
Waist in cm's	375	42	13	55	27.59	7.996

Figure 1: Prevalence of obesity among between studied groups based on body mass index categories

The age interval of participants was 12 years (minimum) to 21 years (maximum). Maximum height of the participants was 191 cm and minimum was 120 cm. Maximum weight of participant was 120 kg and minimum was 25 kg. The range of BMI was 14 kg/cm (minimum) to 73 kg/cm (maximum). Maximum waist measurement was 55cm while as minimum was 13 cm. Figure 1 presents the status of adolescents' health as per the BMI classification. Results show that less than 50% of studied subjects are healthy. Approximately 30% of adolescent are underweight in secondary as well as intermediate whereas, approximately 20% and 10% of adolescent are overweight and obese respectively whereas morbidity obese has been seen 1% for secondary and 3% for intermediate level of adolescents. Calculated mean BMI for males was 24.1 kg/m^2.

Table 2: Socio-economic and demographic information of the studied subjects

Question Asked	Answer level	Frequency	Percent
Living with parents	Both father and mother	353	94.1
	Mother only	15	4.0
	Father only	4	1.1
	Grand parents	3	.8
Family members	2 - 4	36	9.6
	4 - 6	97	25.9
	6 - 8	125	33.3
	more than 8	117	31.2
Mothers education	Illiterate/ primary	144	38.4
	Middle - secondary	125	33.3

	University level	106	28.3
Fathers education	illiterate - primary	53	14.1
	Middle - secondary	173	46.1
	University	149	39.7
Working mother	no	94	25.1
	yes	281	74.9
Family income	up to 5000	82	21.9
	5000 - 10000	112	29.9
	more than 10000	181	48.3
Area	rural	29	7.7
	urban	346	92.3

Results revealed the maximum respondents 94.1% were living with parents while as 33.3% respondents had 6-8 family members and 31.2% respondents had more than 8 family members. Mothers of 38.4% respondents had only either up to primary education or were illiterate. Fathers of 46.1% respondents had education up to middle to secondary schools. Mothers were working in 74.9% responses. While as 48.3% respondents' family income was >10000 SAR. 92.3% respondents were from urban area.

There was significant association between the level of education and awareness among the adolescent. We test by using chi square test χ^2 = 5.031 and p= 0.025. There was no significance (χ^2 = 6.227 and p= 0.134) between the education level and eating patterns among the mothers of studied subjects. P-value is greater than our chosen significance level. As it was concluded that the state of the knowledge has been changing due to change in technology and it's not depended only on the education or knowledge of the parents.

Out of total respondents 63.5% believed that eating habits effect their health which shows a good sign of awareness regarding eating habits. 66.1% believed that changing life style can improve the health. But attitude towards healthy diet is not as good as only 38.4% had the habit of checking ingredient of food products before buying. In comparison test we found that urban and rural area doesn't have any relation (P > 0.05) with the rate of awareness among studied subjects.

Table 3: Daily activities of the studied subjects

Questions Asked		Frequency	Percent
Meals you eat per day	3	188	50.1
	less than 3	127	33.9
	More than 3	60	16.0
Breakfast	daily	256	68.3
	2-3 days per week	64	17.1
	4-5 days per week	42	11.2
	working days missing	13	3.5
Lunch	daily	297	79.2
	2-3 days per week	34	9.1

	4-5 days per week	27	7.2
	working days missing	17	4.5
Dinner	daily	289	77.1
	2-3 days per week	37	9.9
	4-5 days per week	25	6.7
	working days missing	24	6.4
you eat outside home	daily	28	7.5
	1 - 3 per week	190	50.7
	4 - 6 days per week	106	28.3
	only home	51	13.6
Choices among the restaurants	yes	277	73.9
	no	98	25.9
Restaurant type	fast food	164	43.7
	traditional food	211	55.7
Consumption of fast food per week	daily	15	4.0
	1 - 3 per week	181	48.3
	4 - 6 per week	112	29.9
	dont eat fast food	67	17.3
Soft drinks take per day	1-2	186	49.6
	more than 2	83	22.1
	Don't drink	106	28.3
Energy drinks per day	1 - 2	117	31.2
	more than 2	40	10.7
	dont drink	218	58.1
Sleeping hours after dinner	0	47	12.5
	1	106	28.3
	2	222	59.2
Hours you sleep per day	less than 8	202	53.9
	more than 8	173	46.1
How many hours do you watch TV	upto 1 hour	170	45.3
	1 - 2 hour	113	30.1
	more than 2 hours	92	24.5
You eat while watching TV	yes	234	62.4
	no	141	37.1
Number of hours you use internet daily	upto 1 hour	62	16.5
	1- 2 hours	79	21.1
	more than 2 hours	234	62.4
Smoking habit	yes	27	6.7
	no	348	92.8
Playing games or using gym	yes	174	46.4
	no	201	53.6
Hours spend to play indoor games	1 hour	186	49.6
	1 -2 hour	83	22.1

	more than 2 hours	106	28.3
Participating in a program about the food impacts on health	yes	91	24.3
	no	284	75.7
	Total	375	100.0

Among the studied subjects 50.1% takes 3 meals per day. 68.3% take daily breakfast. 79.2% take lunch daily. 77.1% take dinner daily. 50.7% take 1-3 meal outside per week. 73.9% chose the specific restaurant while outing. 55.7% preferred traditional-food restaurant. Overall, 57% participants were taking 3 to 4 fast food meals weekly and 48.3% respondents preferred fast food 1-3 times per week. 49.6% respondents take 1-2 soft drinks per day and 22.1% respondents take more than, two soft drink per day.

58.1% didn't take any energy drink while 31.2% take 1-2 energy drink per day.. 70.7% respondents were spending 3 to 4 hours daily in watching TV, using the Internet or play Station. 62.4% had habit of eating while watching TV. 62.4% used internet daily for more than 2 hours. 92.8% smoked. 53.6% respondents didn't play outdoor games or went to gym while in the most of the studies it has been found that physical exercise are not done regularly in 65% responses.

Table 4: Significance between the study level and awareness.

		Study Level		Total	χ^2	sig.
		Intermediate	Secondary			
Eating habits effect your health	Yes	86	152	238	1.414	0.234
	No	58	79	137		
You check the ingredients of food products before buying	Yes	56	88	144	.024	0 .878
	No	88	143	231		
Changing life style improve your health	Yes	88	160	248	2.633	0.117
	No	56	71	127		
Participating in a program about the food impacts on health	Yes	44	47	91	5.031	**0.025**
	No	100	184	284		

Among the studied subjects 75.7% didn't participate in any awareness program related to food safety. We compared schooling level with the awareness level among student in which we found that there was an association at 95% confidence interval between the participation of awareness program and the level of schooling. We can deduce that as we increase in the level of schooling the participation of students in awareness programs increases.

Table 5: Anthropometry analysis of the studied subjects.

Adolescents school level		N	Mean	Std. Deviation	Std. Error Mean	t -value	sig.
BMI	Intermediate	144	22.12	6.459	.538	-1.131	0.259
	Secondary	231	22.83	4.874	.321		
waist	Intermediate	144	23.47	7.537	.628	-8.502	**0.001**
	Secondary	231	30.15	7.172	.472		

There is no association between level of schooling and BMI of students (p value > 0.001) while the association between the level of schooling and waist circumference has been noticed (p value 0.001)

5.0 Discussion

The mean age of student was 16.11± 1.891 years. About 40.8% of students had normal BMI, but underweight was 32.2%, where overweight and obese students were 27% which is better than the study conducted by (Al-shahrani MM et al., 2017), and (Alshahrani MM et al., 2015). Studies in the Eastern province Al-Hasaa, KSA, revealed that the combined prevalence of obesity and overweight was (23.9%), which had the highest prevalence compared to other studies in KSA. While another school- based survey in the Kingdom revealed that the overall prevalence of overweight was 11.7% and obesity was 15.8% (combined prevalence of obesity and overweight 27.5%) among the included subjects aged 6-18 years. The highest prevalence of obesity was recorded in the capital, Riyadh. (Al-Rukban MO., 2003).

The prevalence of thinness clearly increased with age among intermediate and secondary adolescents see figure 1. Many adolescents skip breakfast in particular or eat the wrong kind of breakfast. (Samuel S., (2006) in his thesis points out those adolescents who skip breakfast is missing an opportunity to boost their nutrient intake, which has a negative effect on their learning performance and academic achievement. Our study showed that 34% skips at least 1 meal per day and 17% skips breakfast most days of the week. Also this study finds that 49% eats fast foods 1-3 times per week and 59% of the adolescents prefer fast foods restaurants. Previous studies concerned found that adolescents tend to skip regular meals and instead of enjoying a balanced meal, consume fast foods during the day resulting in weight gain. (Rolland-Cachera MF et al., 2002).

Furthermore, food choices made by adolescents particularly fast food which is relatively low in vitamins and minerals and also increase the risk for developing obesity, heart disease, irritable bowl etc. This study revealed that 74% of the adolescents do make choices among different restaurants particularly fast food restaurants. while according to the study done by (Al-Almaie, S. 2005) the majority of the students 91.3% admitted eating fast foods and most of them took fast food twice or less per week and 57% participants were taking 3 to 4 fast food meals weekly respectively.

The rising prevalence in overweight adolescents is of particular concern because of the implications for negative effects on their morbidity and mortality in young adulthood. Socio-cultural pressure to be thin and higher food restrictions could explain that being overweight is associated with more healthy food consumption and low external eating. That may be the reason that partial gasterectomy is done in overweight patients, so that the hunger receptors are not stimulated; however the author explores the same concern for underweight adolescents. There are number of studies which demonstrated higher rates of hospitalizations and mortality in underweight adults, compared to those with weights within normal ranges. Underweight status has been associated with higher rates of morbidity and mortality, although to a lesser extent than obesity (Cole TJ, Flegal KM, Nicholls D, Jackson AA., 2007). Overweight and obesity is definitely associated with a relative increase in non communicable diseases. It is an integral component of the metabolic syndrome, which is emerging as a key constellation of risk factors for cardiovascular disease. A study found 14 years old, 32% of American girls and 53% of American boys drink more than three soft drinks daily (Grimm GC, Harnack L & Story M., 2004). In this study 50% of the adolescents are drinking soft drinks 1-2 times per day. There are numerous studies which show the negative health effects of soft drinks like diarrhea, diabetes even soft drinks contains soda and caramel coloring in soda is linked to cancer.

This study showed that being overweight was positively associated with restrained eating, and negatively associated factors. Skipping meals, irregular or no breakfasting as most of the days and inadequate choices are also responsible for adolescent's thinness which is associated with low physical and mental activity. No associations between routine meals restaurant choices, eating outside home and overweight or underweight were found in multivariate analyses.

It is reported that watching television during family meals is associated with poorer dietary quality among adolescents and increased television viewing is associated with increased caloric intake, consumption of higher-fat food and lower intake of fruits and vegetables (Al-shahrani MM et al., 2017). In this study we find that 62% of the students do eat while watching TV.

Eating meals with one's family may increase the nutritional intake of each meal. (Story M. et al., 2008). Adolescents who eat with their families generally consume more nutritious meals throughout the day, compared to those who eat alone or with friends. Therefore, development of eating with one's family may help to prevent skipping meals and overeating. Sadly, less than half of adolescents eat with their families seven times a week according to Hayat Saeed (2008), which is less than what we found in this study. This study showed that 87% of the adolescents do not eat regularly at home. The prevalence of eating out side among adolescents is increasing exponentially which is not good sign as far as adolescents' health is concerned.

This study shows that the students are more active in comparison to the study done in metropolitan cities of KSA. (Al-Rukban MO., 2003), (Al-shahrani MM et al., 2017), Elbadawi AS et al.,2014). 49.6 played indoor games for at least 1 hour but majority of the students do not actively participate in the sports. It can be concluded that many adolescents are not aware of the importance of physical activity and it might be the reason that most of them do not participate in regular exercise. The trends across the variables indicate that students are indeed changing their behaviors over time but that changes may be considered to the behavior of their peers. This persistence suggests that the consolidation of these health behaviors may begin in their primary level and that interventions in early grade school are

warranted. In both secondary and intermediate group there are subgroups of students who remain at higher risk than their peers. A stable and consistent pattern of smoking onset was observed in which less than 7% of adolescents smoked which is less than the studies done in some developed countries (Kelder, S. et al., 1994) and also in Kingdom of Saudi Arabia. There are some published data which exist on epidemiology of smoking in Kingdom Saudi Arabia. It is considerably important that the adolescents initiate smoking with the support or habit of their peers which influences adolescents to smoke.

This study found that 76% of the students don't attend any programs or information about the role of food in the health so the lone source of information is internet. The educational level of both adolescents and their parents showed the most convincing association with nutritional knowledge. We did not found any significance regarding the awareness is concerned between the rural and urban students, while a study by Naeeni MM, et al. (2014) found that students from urban areas have a higher awareness about healthy eating (P < 0.001). The present study shows that 39% of mothers are illiterate or having up to primary educational level. In our study there is no relation between the mother's education level and the influence of food habits intake p value is greater than our chosen significance level (p 0.05), we conclude that there is not enough evidence to support that mother's education level influences children's' food intake of. Several studies have shown that a child's eating behavior is strongly influenced by the family environment. The family eating environment includes parent's own eating behavior and child feeding practice. Research on intergenerational influence demonstrates how information, beliefs and resources are transmitted from one generation to the next and implies a particular mechanism by which parent's attitudes and beliefs affects the children.

6.0 Conclusion

Study concluded that there was a significant influence of social factors on the life style and specially eating pattern of studied subjects. Urbanization, inclination towards fast food, carbonated, energy drink and lack of physical activities exert their negative influence on eating habits. More than half studied subjects fell under unhealthy category as majority of subjects had bad eating habits like eating while watching TV and using internet. Their lifestyle was not healthier in all aspects as being overweight and underweight were also associated with low physical activity, skipping breakfast and high restrained eating. Although with the level of education the awareness of food habits increased which shows the way out to solve the problem.

7.0 Recommendation

It is required to reframe the message regarding eating behavior to adolescents. Adolescents are present-oriented, they are concerned about having lots of energy, achieving and maintaining a healthy weight, their physical appearance, and doing well in school. It is recommended that implementation of a behavioral research should be encouraged. The social influence can be used to develop public health message to adolescents for preventing the severe thinness and severe obesity. We are in position to better define cut-offs for different

degrees of health status in order to estimate trends in underweight or over weight and to design the most effective preventive measures.

Adolescents need to be aware of the long-term risks and benefits related to eating behavior, focusing on the short-term or immediate benefits will have more appeal to them. Health lectures at community level and schools must be encouraged and should be included in the curriculum at the higher school level.

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Declaration

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