ORIGINAL ARTICLE
DETERMINANTS OF EATING HABITS AND PHYSICAL ACTIVITY AMONG FEMALE STUDENTS OF GOVERNMENT SCHOOLS OF URBAN CITY OF PAKISTAN

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Background: Obesity is constantly increasing among adolescents since the last few decades becoming an alarming situation worldwide. The objective of this study was to know the determinants of eating habits and physical activities among school-going female adolescents of public sectors schools of Rawalpindi Pakistan. **Methods:** A cross sectional study with mixed method with both quantitative and qualitative approach was conducted on three public sector schools of Rawalpindi Pakistan. Sample size of 384 female students of grade 5–10 were interviewed on reliable and validated tool after taking their consent and ethically approval. Moreover, four focus group discussion (FGD) with 30–45 minutes spent on each were conducted by inviting 6-8 participants in each group. Qualitative findings were triangulated with quantitative results. Study was ethically approved from the institutional review board of Health Services Academy Islamabad Pakistan. **Results:** Females schools' students were included in this study were 384 with mean (SD) age 11.9±1 year. Majority (38%) were of class 7th and their mothers (42%) were educated. Mostly (42%) students were obese (53%) eat the vegetables rarely in their diet. Above half (59%) were those students who eat deep fried potato chips daily. There was a significance difference were seen among normal and obese female students regarding the dietary habits in different class of enrolment (<0.001), mother's education (0.04), intake of sweat confectionary (0.01), intake of meat (0.00), junk food (0.00), use of energy drink (0.03), use of milk (0.02), physical activity (0.00) and play games (0.00). However, intake of vegetables (0.23) and mother's education (0.081) were found insignificant in this study. Majority (88.5%) of students were also playing games in their daily activity. Below half (44%) respondents used to involve in physical activity. Qualitative findings triangulate with quantitative findings and themes were generated like; awareness on healthy diet, eating junk food, dislikes vegetables in diet and physical activity. **Conclusion:** Study concluded the factors including student's age, mother's education, intake of junk food, physical activity and play games are associated with obesity among the female students of government school in urban area of the country.
Keywords: Eating habits; Determinants; Physical activity; Female students; Adolescent; Active games and exercise

INTRODUCTION

The adolescence period is recognizing as the most developmental stage of life and is defined as per World Health Organization "as individuals in the 10–19 years age group". It has been estimated that in 2016, about 1.8 billion adolescents residing all over the world out of this 340 million were overweight and obese.[1] Obesity is constantly increasing among adolescents since the last few decades becoming an alarming situation worldwide. Increase consumption of junk food, carbonated soft drinks, and physical inactivity is mostly associated with obesity which may lead to many non-communicable diseases; diabetes, Cardio vascular diseases, Hypertension, premature aging, mental disorders, infertility and complexity of syndromes.[2–4] Every region has dietary guidelines; proper intake of a healthy diet can reduce the risk of many morbidities and mortalities.[5,6] The availability of healthy or unhealthy food also contributes to the eating behaviour of any individual; in developing countries, healthy food such as fruits, vegetables, meat, milk are much expensive as compared to fast and processed food.[7] Consumption of fast food is growing day by day; adolescence is the most crucial phase as the taste

and eating habits once developed remain for the whole life.[8]

Female adolescent age group students are more prone to obesity as it is the time of biological & hormonal changes that might cause increase fat cells and muscle mass, so the intake of junk food accelerates the obesity which further leads to hormonal imbalances, psychological stress and social distancing.[9–11] Poor quality intake of diet for a log period will also affect the academic performance of adolescents at schools.[12] Physical inactivity, prolong usage of computer-based games, excess sitting time is considered as a sedentary lifestyle that promotes excessive production of adipose tissues. Obesity also has serious adverse effect on physical and mental health.[13] WHO has recommended 30 minutes of light to vigorous physical activity for adolescents per day, a survey of 30 countries shows that only 15.4% of the female lie in the required criteria. In 2016, about 84.7% of adolescents' girls were physical inactive globally.[14]

Nutrition is usually identified as to be an essential component in the aptitude to get a healthy and prosperous life. Still, malnutrition (under and over nutrition) remains a core issue worldwide. The consequences of malnutrition are catastrophic, not bound to life ends but it also increases the morbidities and deteriorates the immunity of the individuals.[15,16] A balanced and healthy diet is very crucial for physical and cognitive growth. Childhood and puberty are the most delicate part of the life, diseases and dysfunctions occur at this stage may lead to many disorders in the adult part of life, 7–12 years of age of girls and boys had high rates of obesity than other groups of any age.[17–19]

Food consumption varies from day to day and seasons to seasons moreover mostly people eat and drink a variety of foods items and beverages without taking measures of nutrition.[20,21] Exercise and constant physical activities increase energy expenditures and will be effective in metabolism and body mass composition.[22–24] The causes of unhealthy dietary practices and inactive physical lifestyles are complex and diverse in social, physical, and environmental aspects.[25] Schools are the main places where most of the children are reported both as under and over the nutrition.[26]

We were aiming to improve the health among school-going children of Rawalpindi through objectives of the determinants of eating habits and physical activities among school-going female adolescents of public sectors schools of Rawalpindi Pakistan.

MATERIAL AND METHODS

This was a cross sectional study design with mixed method approach and was conducted in three female government schools selected randomly in Rawalpindi, districts of Pakistan. Students enrolled in class 5–10 with age 10–14 years were selected randomly from the list of registration available with the school administration. For quantitative approach, pretested, validated, piloted tool was adopted for this study. Total 384 female students were included in this study after calculating proper sample size by using single population proportion formula. Data were analysed through SPSS version 21 and simple statistics were drawn. Institutional Review Board of Health Services Academy, Islamabad Pakistan, ethically approved this study. Written consent was taken from the school administration prior to start the data collection process. Qualitative component was conducted through a Focus group of 6–8 participants were generated on the question guide developed through intensive literature review. Notes were taken by the data collectors and voice recorder was also used for recording the discussion. Thematic analysis was done and final nodes, sub-nodes and themes were generated.

RESULTS

The mean (SD) age of the students was 11.9±1 year. The majority (38%) of the students were student of class 7th. Most of the student's mothers (42%) were educated with matriculation ten years of schooling. Nearly half (45%) of the mothers were working and (55 %) were housewives.

The education of fathers was mostly (38%) had 5 years schooling and (40%) were working in different occupation followed by (35%) had their private jobs. (Socio-demographic characteristics of the respondents are given in table-1.

Mostly (41.9%) students in this study were found obese and (9.2%) were malnourished. Many students (38.6%) students said that they eat confectionary like; chocolates and toffees in school. More than half of the respondents (52.6%) eat the vegetables rarely in their diet. (54.4%) were those who take fruits daily in their diet and (41.1%) said that they eat meat in their diet rarely. (61.7%) respondents reported that they take meat product in diet

weekly. Above half (58.6%) were those students who eat deep fried potato chips daily. Nearly half of the students were eating snakes (48.2%), cakes (47.7%) and chocolate (88.8%) in their daily diet in spite majority (93%) of them knows that the junk food is not good for health. Mainly students (83.4%) has reported that they are using milk less than one cup in their diet daily and two thirds (66.7%) students intake water more than five cups every day. (Table-2).

Above half (60.4%) students were attending schools by walk from their home and (88.5%) were also playing games in their daily activity. Below half (44%) respondents were spend one hour daily for physical activity and mostly (47.1%) plays outdoor games (Table-3).

There was a significance difference were seen among normal and obese female students regarding the dietary habits in different class of enrolment (<0.001), mother's education (0.042), intake of sweat confectionary (0.010), intake of meat (0.004), junk food (0.00), use of energy drink (0.033), use of milk (0.020), physical activity (0.00) and play games (0.002). However, intake of vegetables (0.23) and mother's education (0.081) were found insignificant in this study (Table-4).

Following themes were generated during the qualitative analysis triangulated with our quantitative findings.

Awareness on healthy diet

Most of the students were aware on healthy eating and have enough knowledge about the consequences of a good and healthy diet. Following are the explanation of focus group discussion (FGD);

"Healthy food is the one that keeps us fit, healthy and that helps in growing". (FDG-3).

"Vegetables, fruits, milk, and eggs are a healthier diet, meat is also in a healthy food group but we don't like it". (FDG-2).

Eating Junk foods

All respondents expressed their feeling that they love to eat fried and spicy food. Many participants answered that they usually consume burgers, shawarma, and pizza along with soft drinks or cola beverages during school break time. Following are the explanation of focus group discussion (FGD);

"The crispy and fried food appeals to me whenever I go by the street, the maker makes so good samosas and pakoras I love them to eat. (FGD-1).

"I like to have pizza with a cold drink with fried potato chips". (FDG-2)

Dislike vegetables in diet

Most of them answered against vegetable intake. By probing that why they don't like, followings were the responses;

"I don't like veggies especially bitter grout, capsicum, pumpkin, and onion. If I found an onion in any of my food, I use to avoid it". (FGD-2).

I like to have meat kababs and meatballs, especially on Eid days. C FGD-1.

Physical activity

The research shows that participants know about health and nutrition as with the help of their teachers and parents.

"I play cricket, it is a very good game to play, cricket gives me pleasure and happiness. MY father some time joins us and we make a lot of fun". (FGD-1).

"Every teacher in our schools gives a lecture on health, physical fitness, and personal hygiene". (FGD-2).

"We do physical activities to keep us fit, our teacher told us that it keeps you fit and healthy your brain becomes very sharp and enables us to do innovations". (FGD-3).

2014, where about (40%) of females at urban area.[27]

Table-1: Socio-demographic characteristics of the participants (n=384)

Variables	Categories	Frequency (n)	(%)
Age in years	10	35	9.1
	11	87	22.7
	12	145	37.7
	13	78	20.3
	14	39	10.2
Class/ Grade	6	87	22.6
	7	145	37.7
	8	108	28.1
	9	44	11.6
Mother's education	No education	74	19.3
	5-year schooling	140	36.5
	10 years schooling	163	42.4
	> 10-year schooling	07	1.8
Mother's occupation	House wife	143	37.2
	Private job	75	19.5
	Other	166	43.3
Father's education	No education	102	26.5
	5-year schooling	148	38.5
	10 years schooling	126	32.8
	> 10-year schooling	08	2.2
Father's occupation	Unemployed	17	4.4
	Government Job	26	6.8
	Private Job	136	35.4
	Business man	51	13.3
	Other	154	40.1

Table 2: Eating habits of students (n=384)

Variable	Values	(n)	(%)
Body mass index	Malnourished	35	9.2
	Normal	186	48.4
	Over weight	161	41.9
	Obese	02	0.5
Type of food Mostly eat at School	Fried	85	22.1
	Fruits	30	7.8
	Baked products	121	31.5
	Confectionary	148	38.6
Vegetable Intake	Daily	115	29.9
	Weekly	67	17.5
	Rarely	202	52.6
Fruits intake	Daily	209	54.4
	Weekly	113	29.4
	Rarely	62	16.2
Intake of Red meat	Weekly	114	29.2
	Monthly	112	29.7
	Rarely	158	41.1
Intake of meat Products	Daily	21	5.5
	Weekly	237	61.7
	Monthly	104	27.1
	Rarely	22	5.7
Intake of Chips	Daily	225	58.6
	Weekly	130	33.9
	Monthly	26	6.7
	Rarely	03	0.8
Intake of Snacks	Daily	185	48.2
	Weekly	149	38.8
	Monthly	46	12.0
	Rarely	04	1.0
Intake of Sweet, cakes pastries	Daily	183	47.7
	Weekly	137	35.7
	Monthly	56	14.6
	Rarely	08	2.0
Confectionaries	Daily	341	88.8
	Weekly	43	11.2
	Monthly	00	00
	Rarely	00	00
Junk food have Side effects	Yes	357	93
	No	27	07
Milk Intake	< 1 cup /day	320	83.4
	2 cups	60	15.6
	3 cups	04	1.0
Coke Intake	< 1 cup/day	220	57.3
	2 cups	154	40.1
	3 cups	10	2.6
Water Intake	<2/day	1	0.3
	4 daily	16	4.2
	5 daily	111	28.8
	> 5	256	66.7
Getting info of nutrition	Teacher	190	50
	Course book	113	30
	TV /Media	65	16.0
	Newspaper	16	4.0

Table-3: Details of Physical activities among female students (n=384)

Variable	Value	Frequency	Percentage
Coming to School	Bike	58	15.4
	Car	17	4.3
	Cycle	06	1.6
	Local van	40	10.3
	Van	31	8
	Walk	232	60.4
Play in school	Yes	340	88.5
	No	44	11.5
Time spend in physical activity	Less than ½ hr	82	20
	1 hour	159	44
	2 hours	99	25
	More than 2	44	11
Mostly played games	Indoor	118	30.7
	Outdoor	181	47.1
	Computer based	85	22.2

Table-4: Difference in dietary habits and physical activity among normal and overweight (obese) female school children (n=384)

Variable category	Normal n (186)	%	Overweight (obese) n (163)	%	p value*
Class / grade					
6	69	37	18	11	
7	80	43	65	40	0.001*
8	30	16	78	48	
9	07	04	02	01	
Mother's Education					
Uneducated	64	35	76	47	
<10-year schooling	56	30	73	45	0.042*
> 10-year schooling	66	35	14	08	
Mother's Occupation					
Housewife	78	42	124	76	
Maid	39	20	18	11	0.081
Other	69	38	21	13	
Intake of sweets & confectionaries					
Daily	94	51	113	69	
Weekly	69	37	41	25	0.010*
Monthly	23	12	09	06	
Intake of vegetables					
Daily	79	42	52	32	
Weekly	89	48	75	46	0.23
Monthly	18	10	36	22	
Intake of meat & meat products					
Daily	36	19	67	41	
Weekly	69	37	82	50	0.004*
Monthly	81	44	14	09	
Intake of junk food/fast food					
Daily	47	25	69	42	
Weekly	96	52	72	44	0.000*
Monthly	43	23	22	14	
Intake of coke/ energy drinks					
Daily	36	20	59	36	
Weekly	101	54	79	48	0.033*
Monthly	49	26	25	16	
Intake of milk including milk product (daily)					
≤ 1 cup	23	12	07	04	
2 cups	74	40	54	33	0.020*
3 cups	89	48	102	63	
Time spend In physical activity					
<1/2 hour	67	36	74	46	
1 hour	71	38	48	29	0.000*
2 hours	48	26	41	25	
Mostly played Games					
Outdoor	96	52	43	26	
Indoor	71	38	52	32	0.002*
Computer based	19	10	68	42	

<0.05= significant difference

DISCUSSION

Our study participants are found more obese and this is prevailing in urban settings. These findings were supported by Pakistan demographic health survey Study found that the consumption of healthy diet along with physical activity can reduce the risk of non-communicable diseases and

early deaths. The study conducted at Italy also supported our study that balance diet with exercise can enhance the quality of life, providing stability to mental health and improvement in the academic performance.[28] The similar study also coincide with our results that physical inactivity of early age is associated with Body Mass index (BMI > 26)[29], increasing the risk of cardiovascular system (CVS)[30,31], Hypertension (HTN), diabetes[32,33], Metabolic syndromes[34], mental disorders[35], infertility[36]. Daily intake of junk food and carbonated drinks shows a significant association with overweight and obesity, similar study at Indian region shows the same results on adolescent females having high consumption of fast food with increase value of BMI.[37] Excessive intake of red meat is also the main cause of obesity associated with hypertension, our study findings were supported by other research results that shows significance of red meat consumption in early ages.[38]

Our findings show the significance of outdoor games within students. However, similar study conducted on the same cohort supporting our results that 91% of school going females play only computer games.[39,40]

Study shows that almost all of the population was aware of food, dietary intakes, and regular physical activities. A healthy diet and nutrition contribute a lot to the development of the brain as well as the immune system.[41] All students came up with a positive perception about health but there is a contrast in their attitude regarding eating habits and physical activities. Students can't resist this tasteful good appearance and spicy meals as food providers are repeatedly publicities themselves and can be available at affordable prices, on the other hand, healthy food such as fruit vegetables and other dairy products are expensive as compare to these oily and spicy foods.[42] There is a need for change in behaviour as nobody practices to have a glass of milk or other fresh juices but they are willing to buy carbonated harmful drinks to themselves and also for others.[43]

CONCLUSION

Study concluded that the determinants like age, mother's education, intake of junk food, physical activity and play games are associated with obesity among the female students of public sectors of the country. However, majority of students were obese and eating junk food in School. Though they had better knowledge on diet and also involved in physical activity and regularly performing their outdoor games.

AUTHORS' CONTRIBUTION

FJ, RK: Study conception. NLS, SH, FA: Data collection, investigation. FA, MA, PK: Analysis. RU, SK, RK: Writing, critical review, revision, final approval, accountability for all aspects of the work.

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