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Dietary habits among primary school students in Algadid Althora/Al gazira State: Sudan 2022

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Abstract
Background: Nutrition is essential element. For life. Result of. review showed that nutrition. Has remarkable effects on brain function, so. Protein, iron, iodine, and the consumption of breakfast meal. Have impact on a child's learning capability and behavior. Healthy eating habits should be established in. early childhood and maintained. Throughout adolescence stage. To attain. Good academic performance and to. Prevent diet-related chronic diseases as obesity and. diabetes mellitus.
Objective: To study healthy dietary habits among Sudanese primary and intermediate. school children. In Algadid Althawra at. Algazeira state, and indentify the mostly consumed types of food and factors affect dietary habits.
Method and Analysis: Descriptive cross-sectional study of. 235 sample size was conducted in: Moaz-lbn Jabal and Al-shaheed Hamza schools for male Al-gadid Althowra in Al-Gazeira state in Sudan. The data was collected randomly from the students by using structured-interview questionnaire and analyzed by SPSS (Statistical package for the social science) system.
Result: Family size and number of children were found to influence the dietary pattern in the
school-aged children, most fathers were free workers. About (50.2%) eat meals 3 times per day, (28.1%) tow times, (19.6%) more than three times and (2.1%) once per day. Lunch is the main meal per day in about (58.3%), dinner (35.3%) and breakfast in (6.4%). Lunch consist mainly of carbohydrate in (44.3) of them. About (45.1%) were prefer all types of food, (30.6%) carbohydrate. (16.2%) lipids and (8.1%) proteins. Nearly (78.3%) eat snacks during the day, Indome is the most consumed one about (58.2%) followed by chocolates and sweats (21.2%).
Recommendation: Considering the results of this study it is suggested for public health and government torise awareness of the parent's especially mothers. Prepare balance food. And healthy diet contents and promoting provision of healthy diet at school

Keywords: Dietary habits-students-primary schools

Introduction

Nutrition is essential element. for life, it is biochemical and physiological process by which an organism uses food to support its life, perform many function as. ingestion, absorption, catabolism, biosynthesis. and excretion. Food is here defined as any substance that people eat and drink to maintain life and growth. and Food Security is "Adequate access to food for all people at all times for an active, healthy life". food literacy is applying all. information on food choices on personal. and. society health [1]. result of. systematic review showed that nutrition. has remarkable effects on brain function, so. protein, iron, iodine, and the consumption of breakfast meal. have impact on a child's learning capability and behavior. Moreover, recent research has identified additional, roles of micronutrients, such as essential fatty acids and vitamins, minerals, in the prevention of learning and behavioral disorders as. attention deficit hyperactivity disorder [2] In other way studies included in the present review suggest there is insufficient evidence to identify any effect of nutrition, diet and dietary change on learning, education or performance of school-aged children from the developed world. However, there is emerging evidence for the effects of certain fatty acids which appear to be a function of dose and time, challenges of. factors such as family and community context, disease, poverty and rate of individual maturation and neurodevelopment will remain.

Whilst the importance of diet in educational attainment remains under investigation, the evidence for promotion of lower-fat, sugar salt and diets, high in vegetables fruits, promotion of physical activity remains crucial in terms of health outcomes for all schoolchildren [3]. Healthy eating habits should be established in. early childhood and maintained. throughout adolescence to prevent diet-related chronic diseases as obesity and. diabetes mellitus. Although studies showed evidence of. dietary role in students" learning and performance still knowledge of students. regarding balance food and adherence to. healthy dietary. habits is. inadequate as shown in study, a low percentage of adolescents have good practice and their attitude and practice is not. related to their nutritional knowledge [4]. and still majority do not have. satisfactory knowledge. nutrition. and. Exercise [5].

Sudan is large country with diversity and different cultures and habits. The culture of healthy habits is lacking in many areas due to illiteracy and poor knowledge of importance of healthy dietary intake and other factors as poverty which led to wasting and malnutrition among students in some rural area [6].

This study was done to assess Sudanese school. students knowledge, attitide and. practice regarding dietary healthy habits.

Research methodology
1. **Study design**
   Descriptive quantitative cross-sectional study.
2. **Study area**
   The study was conducted in: Muaaz lbn Jabal primary school and Al-shaheed Hamza
   intermediate school in Al-gadeed Althowra 1 area in Al-Gazera state in period from. to 2022
3. **Study population**
   The students of Muaaz Ibn Jabal primary school of males and Al-shaheed Hamza
   intermediate school of males aged (8-17) years old.
4. **Inclusion criteria**
   ALL students of Muaaz Ibn Jabal primary and Al-shaheed Hamza intermediate schools who are available at the place and time of the study and agree to participate.
5. **Exclusion criteria**
1. Students who refuse to participate and who are unavailable at the time of the data
   collection.
   Students who had the following medical disorders:
   - congenital heart disease.
   - Hypertension
   - Chronic diarrhea and vomiting.
   High school students and the age more than 17.
6. **Sample size**
   Was calculated by the formula of known population and it is 230 students.
   The formula:
   n = N\1+N(d)2
   n = sample size.
   N = total number of the population
   d = degree of precision (0.04%).
7. **Data collection**
   The data was collected randomly from the students by interviewing using structured-questionnaire in the school locations, each interview will take about 10_7minutes in period of 2 days collected by the research group. The questionnaire is formed of 30 questions designed to obtain the following data:
   The personal data: (age, gender and residence)
   The parental status: (alive or dead, present with the family or away from, divorced).
   The socio-economic status: (parental education, parental occupation and family size).
   The nutrition: (number of meals and types of foods).
   The medical disorders that the student is suffer from.
8. **The data analysis**
   Data is analyzed by using SPSS (statistical package for the social science) program.
9. **Ethical considerations**
   Ethical approval was took from the Omdurman Islamic university, faculty of medicine and. health sciences at the department of scientific research and given to the school managers of. the two targeted schools.
   An. inform consent was took from the school managers students after explaining purpose of study to them. privacy and confentiality was assured during process of data collection. The purposes and objectives of the research were explained to the participants. The questionnaire was filled from the students in their rest time without interruption to the daily

Results
The Study is conducted with a sample size of 235 male students, (57.4%) students of Alshahed Hamza School and (42.6%) of moaz-Ibn Jabal in Althawra new. About (85.5%) residence in Algaded Squer One., (11.5%) Algaded Foug and (3%) In Algaded West. Regarding family status considering numbers of children in family the majority are from 3-6 members whom about (47.7%), from 1-3 members are (26.4), the least are families with more. than 6 members (26%). The arrangement of child within the family was variable as following. (21.7%), (19.1%), (14.5%), (14.5%), (8.5%), (7.7%), (5.5%), (5.1%), (3.4%) are the fourth, second, fifth, first, third, six, eight, seventh, ninth respectively. The educational level of (67.7%) of fathers is primary/high school, (20%) university/higher education, illiterate fathers. were (12.3%). Nearly. (64.3%) of fathers. were free workers, (14.9%) teachers, (11.9) employees, (1.7%) military, (1.7%) police, while not working. were (5.5%).

The educational level of (71.9%) of mothers is primary/secondary school, university and higher education. were (13.2%) while (14.9%). were illiterate.

Majority of mothers. Were housewives (72.3%), (13.6%) employees, (9.8%) teachers, (4.3%) don't work. Paternal state (94.5%) of fathers. were alive and (5.5%). were dead, (79.6%) married one wife, (13.6%) have two, and (3.8%) have three wives.

(4.3%) of mothers are dead and (95.7%) are alive, (96.6%) married and 3.4% divorced. Most of families have medium social income about (69.4%), (22.1%) low, while families with high income only (8.5%). Health state of the children 93.2% of children don't have chronic illnesses. 3.4% have asthma, 0.4% have DM and 3%

have other diseases. 93.2% don't take any medications, while 6.8% do for (sinusitis 43.8%, 37.5%, eye problems (18.8%). (80.9%) of parents not overweight as assumed by their children, while (19.1%) overweight (75.6%) the mother, (17.8%) the father, (6.7%) both). About

consumption of snacks and juices (78.3%) eat snacks during the day, Indome is the most consumed one about (58.2%) followed by chocolates and sweats (21.2%) (88.9%), drink fresh juices, only about (36.8%) of them drink daily, (24.8%) once per week. and (48.3%) 2-3 time per week. (56.6%) eat mixed and rich food on breakfast, mainly carbohydrate (12.6), vegetables and fruits (12.8%), mainly lipid (8.1%), mainly protein (6%). For lunch (44.3%) eat mainly carbohydrate on lunch, while only (34.9%) mixed and riched food, (15.7%) only lipids, (5.1%) vegetables and fruits. For dinner (37%) mixed and rich, (27.2%) vegetables and fruits, mainly protein (22.1%), mainly. carbohydrate (13.6%). About (50.2)% eat 3 times per day, (28.1%) tow times, (19.6%) more than three times, (2.1%) once per day. Lunch is the main meal per day in about (58.3%), dinner (35.3%), breakfast (6.4%). About (45.1%) prefer all types of food, (30.6%) CHO, (16.2%) lipids, (8.1%) protein. About (91.1%) eat their breakfast at school, while (8.9%) at home.

Table 1: This Table Shows Sociodemographic Data

Sociodemographic Data	Count	Table N %	Mean	
Age Distribution	-	-	13.57	
School & its Area	Al-Shahed Hamza School in Althawra new	135	57.4%	-
Moaz Ibn Jabal School in Althawra New	100	42.6%	-	
Gender Distribution	Male	235	100.0%	-
Female	0	0.0%	-	
Number of children in Family?	From 3-6 Members	112	47.7%	-
From 1-3 members	62	26.4%	-	
More than 6 members	61	26.0%	-	
The Child arranges within the family?	Fourth	51	21.7%	-
Second	45	19.1%	-	
Fifth	34	14.5%	-	
First	34	14.5%	-	
Third	20	8.5%	-	
Sixth	18	7.7%	-	
Eighth	13	5.5%	-	
Seventh	12	5.1%	-	
Ninth	8	3.4%		

Table 2: This Table Shows Parental Job And Education

Parent's Job and Education	Count	Table N %	
Father's Educational Level	Primary/High School	159	67.7%
University/Higher education	47	20.0%	
Illiterate	29	12.3%	
Father's job	Free Worker	151	64.3%
Teacher	35	14.9%	
Employee	28	11.9%	
Don't work	13	5.5%	
Military	4	1.7%	
Police	4	1.7%	
Mother's Educational Level	Primary/Secondary School	169	71.9%
Illiterate	35	14.9%	
University/Higher education	31	13.2%	
Mother's job?	Housewife	170	72.3%
Employee	32	13.6%	
Teacher	23	9.8%	
Don't Work	10	4.3%	

Table 3: This Table Shows Parental State, Monthly Income And Residence

Parent's State, Monthly income and Residency	Count	Count /N%	Table N %
State of Father	Alive	222	94.5%
Dead	13	5.5%	
State of Mother	Alive	225	95.7%
Dead	10	4.3%	
Number of wives	One	187	79.6%
Two	32	13.6%	
Four	9	3.8%	
Three	7	3.0%	
Marital Status of mother	Married	227	96.6%
Divorced	8	3.4%	
Family Income	Medium	163	69.4%
Low	52	22.1%	
High	20	8.5%	
Residency	Algaded squre one	201	85.5%
Algaded foug	27	11.5%	
Algaded west	7	3.0%	

Table 4: This Table Shows Health State For Children

Health State for the Children	Count	Count /%	Table N %
Do you have any of the following diseases?	I don't have	219	93.2%
Asthma	8	3.4%	
Other	7	3.0%	
DM	1	0.4%	
Do you take any medication?	No	219	93.2%
Yes	16	6.8%	
Reason of using the drug?	Sinusitis	7	43.8%
Asthma	6	37.5%	
For my eyes	3	18.8%	
Does any of your parents' overweight?	No	190	80.9%
Yes	45	19.1%	
If yes, then who?	Mother	34	75.6%
Father	8	17.8%	
Both	3	6.7	

Table 5: This Table Shows Meals Per Day And The Main Meal

Meals per Day and main meal	Count	Table N %	
How many meals you eat per day?	Three	118	50.2%
Two	66	28.1%	
More than three	46	19.6%	
One	5	2.1%	
The main meal per day?	Lunch	137	58.3%
Dinner	83	35.3%	
Breakfast	15	6.4%	
Type of Food they prefer?	All	106	45.1%
CHO	72	30.6%	
Lipids	38	16.2%	
Proteins	19	8.1%	
Where do you eat your breakfast?	At School	214	91.1%
At home	21	8.9%	

Table 6: This Table Shows Type of Food Children Eat During The Day

Type of Food children eat during the Day?	Count	Table N %	
What do you eat for Breakfast?	Mixed and rich	133	56.6%
Mainly CHO	39	16.6%	
Vegetables and fruits	30	12.8%	
Mainly Lipids	19	8.1%	
Mainly Proteins	14	6.0%	
What do you eat for Lunch?	Mainly CHO	104	44.3%
Mixed and rich	82	34.9%	
Mainly Lipids	37	15.7%	
Vegetables and fruits	12	5.1%	
What do you eat for dinner?	Mixed and rich	87	37.0%
Vegetables and fruits	64	27.2%	
Mainly Proteins	52	22.1%	
Mainly CHO	32	13.6%	

Table 7: This Table Shows Snacks and Juices

Snacks & Juices	Count	Table N %	
Do you eat snacks during the day	Yes	184	78.3%
No	51	21.7%	
Type of snacks you eat	Indomie	107	58.2%
Chocolate & sweat	39	21.2%	
Chips	30	16.3%	
Fruits	8	4.3%	
Other	0	0.0%	
How many snacks you eat per day	One	113	48.1%
Two	68	28.9%	
Three	54	23.0%	
More than three	0	0.0%	
Do you drink fresh juices	Yes	209	88.9%
No	26	11.1%	
How much do you drink juice per week	2-3 times per week	101	48.3%
Daily	77	36.8%	
once a week.	31	14.8%	

Discussion

This is a cross-sectional descriptive study, involved 235 students from Moaz Ibn. Jabal primary school of boys and Al-Shahed Hamza intermediate school in Al-Gadeed Al-Thawra from different classes. The mean age distribution was 13.57 years. Most of the participants were from Al-Shahed Hamza Intermediate School.

According to the family size. most of the students were belong to families with 3-6

members. This result might suggest that the family size can affect the nutritional health status and food choice especially in families with low income based on the findings of the study which like most Africa countries as study in Cape town showed the. large majority of food eaten by adolescent students in Cape Town is. consider unhealthy choices due to low socioeconomic status of their families [7]. The level of the parental education and occupation is known to be a strong factor in determination of nutritional knowledge and practices for their children, Most of fathers were studied just till primary or high school, most fathers were free workers. In the other side, mothers educational level mostly was primary and secondary school and there is increased illiteracy in mothers by 2.6% more than fathers which is consistant with many studies in which significant relationship between level of parental educational level and dietetic safety and knowledge. of offspring [8].

Most of the parents did not suffer from increasing weight. These percents of parental obesity represent one of the unhealthy habits and practices that might affect their children also. because school-aged children depends mainly on their parents especially the mothers in their diet and food. preparation, as well as unhealthy parental dietary behavior affects their offspring habits and subsequently the health status as being. at risk to dietary-related diseases as mentioned in the previous studies [9]. Nearly half of students consumed 3 meals per day that equal to study as the majority of them. consumed three meals a day, with in-between meal snacking [10]. Most of them were prefer all types of food, then carbohydrates as

the most specific food group was consumed the same result as previous study The majority were eat snacks during the day, Indome is the most

consumed one followed by chocolates and sweats similar to study with poor snacking behavior [11]. Carbohydrates as the most specific food group was consumed among majority as seen in. studies documented low intakes of vegetables fruits, and fiber. high sugar sweetened beverages, and inadequate consumption of milk and dairy products, coupled with high intakes of fat, saturated fat, frequent consumption savory snacks [12].

Conclusion

We concluded. that most of students. belonged to low income families with moderate education and. half of them consume. three time. meals per day mainly lunch. which is mostly carbohydrate. with low fresh drinking per week. and inadequate, unhealthy snacks in most of them**.**

Recommendations

1. Increasing awareness in the primary and intermediate school aged children about
   healthy diet. and it's composition. of and how to prepare it according to the local food types availability.
2. Raise awareness of the parent's especially mother's about the healthy diet contents and its effect on their offspring health.
3. To promote and adopt policy of healthy meals in the schools with collaboration of local community and civil society and other NGOs.
4. Conduct more studies about the dietary habits. and other determinants of nutrition in all school and in all ages.

Acknowledgment

Limitation of study

Due to Covid 19 pandemic preventive and restriction measures the study not involved many schools in the locality.

List of abbreviation

SMSB	Sudan medical specialization board
OIU	Omdurman international university
NGOs	Non government international organization

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