ISSN No:-2456-2165

Food Habits and Nutritional Status of School Children in Three Medersa Primary Schools in Niamey, Niger

Oumarou Issoufou Nana Aichatou[1], Sani Maazou Mahamane Sabiou[1], Sabo Haoua Seini[1].
[1]Department of Chemistry, Laboratory of Nutrition and Valorization of Agro-Resources, Faculty of Science and Technology, Abdou Moumouni University of Niamey, Niger

Moussa Abdou Ousseini[2],
[2]Doctoral School of Life and Earth Sciences, Faculty of Agronomy, Abdou Moumouni University of Niamey, Niger

Abstract :- A good diet must be balanced, varied, healthy and sufficient for a child's cognitive development. Unfortunately, Niger still has the highest school dropout rates and undernutrition rates that exceed WHO standards. The objective of this study is to investigate the correlation between the nutritional status of school children and their diet in Niamey, the capital of Niger. The study was conducted on a sample of 381 pupils aged 6 to 15 years enrolled in three primary schools in Niamey. The study included data on anthropometric measurements, dietary habits and the socio-demographic level of the children. BMI tables for children and adolescents aged 5-18 years were used to assess the nutritional status of the children. Statistical results were performed using Excel and SPSS. According to these results, the overall prevalence of underweight was 17.06%, overweight was 6.82% and obesity was 2.10%. A significant relationship was observed between the female gender and nutritional status (P=0.009) and between the age range 9-11 years and nutritional status (P=0.0001).

Keywords :- *Food Habits, Nutritional Status, Children, School Age, Niamey, Niger*

I. INTRODUCTION

Strong, healthy children become resilient and productive adults. A child's life and eating habits change when he or she moves away from the family unit through schooling. A healthy, balanced diet improves a child's normal growth and encourages him or her to take full advantage of school learning opportunities. To this end, malnutrition can cause developmental delays in young people throughout childhood and adolescence, and can lead to poor school performance and school drop-out. The relationship between dietary behaviour and population health has also been an active area of research for several decades [1].

Niger, like all developing countries, particularly those in sub-Saharan Africa, is structurally confronted with a worrying nutritional situation.

Food practices have recently undergone major changes, characterised in particular by an increase in the consumption of fats, by ready-to-eat products, and by an increase in out-of-home catering.

Today, malnutrition can affect all segments of the population, but children are the most affected. Moreover, there are few studies on nutrition and eating habits among children on a national scale. It is with this in mind that it is necessary to study the nutritional situation of school-age children.

In the present work, we proposed to evaluate the relationship between the eating habits and the nutritional status of school children in the capital Niamey (Niger).

II. MATERIALS AND METHODS

A. Study Area

The capital, Niamey, is a distinct urban community. It is administratively divided into 5 communal districts, 65 neighbourhoods, 3 cantons and 27 administrative villages. It covers an area of 239,268 km^2 for an estimated population of 1 335 700 inhabitants in 2021[2]. Three medersa primary schools participated in this study. These were the medersa ZAC primary school located in the Niamey 1 communal district between 13^0 34' North latitude and 2^0 4' East longitude, 2.94 km from the RN24, the medersa Cité Fayçal primary school located in the Niamey 3 communal district between 13^0 30' North latitude and 2^0 8' East longitude, 250 m from the RN1 and the medersa Karadjé primary school located in the Niamey 5 communal district between 13^0 29' North latitude and 2^0 5' East longitude, 250 m from the RN6. Figure 1 shows the map of Niamey and the location of the study schools.

ISSN No:-2456-2165

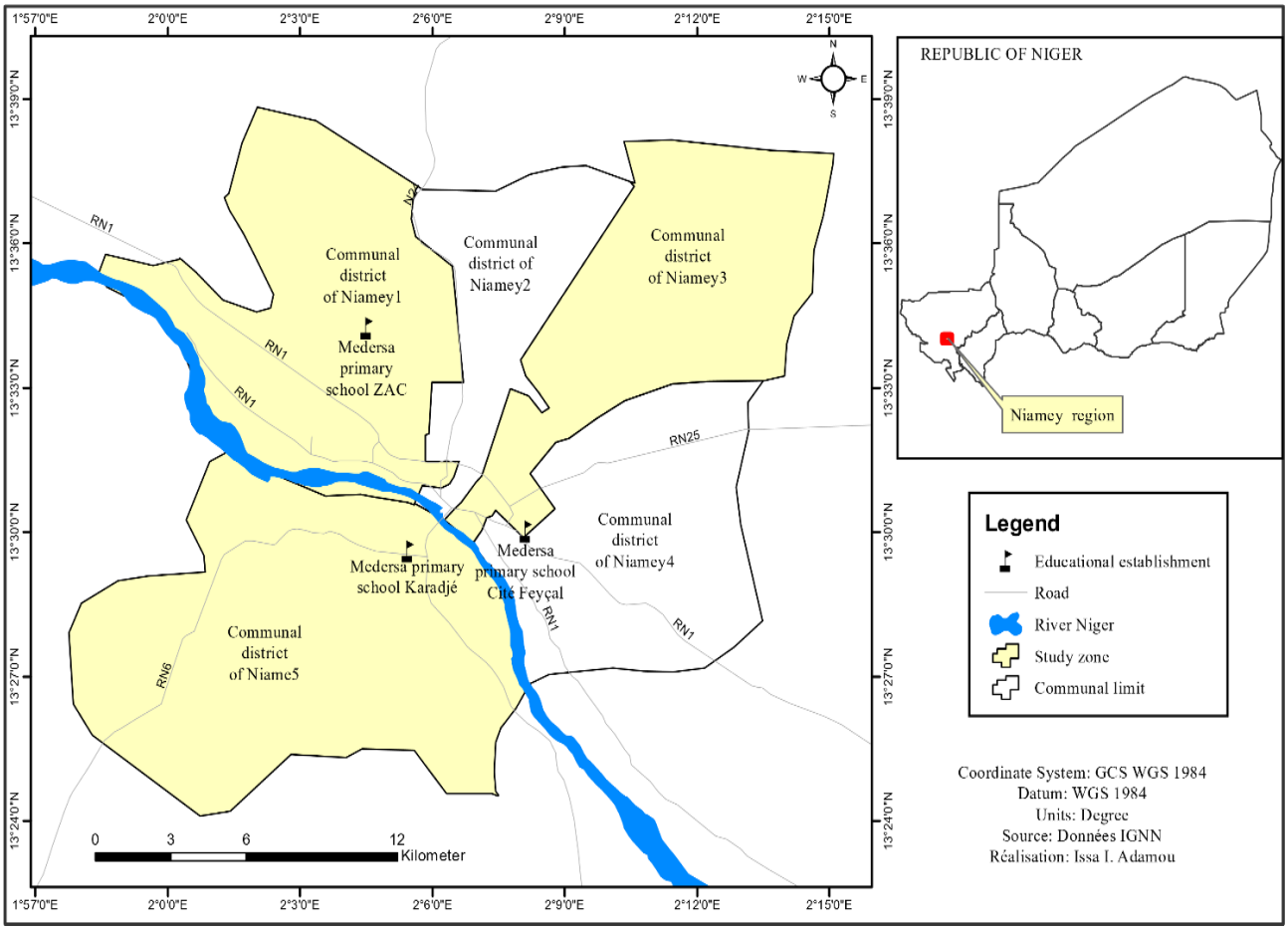

Fig 1 Location of Study Schools in the City of Niamey

B. Data Collection

➢ *Sampling*

School-aged children under 15 years of age in the selected schools were the targets. The sample size was determined using the statistical table proposed by Krejcie and Morgan version 2006 and according to four (4) degrees:

- 1er degree consists of a random draw to determine the types of establishments to be surveyed. To this end, the names of the types of establishments in Niamey were put in an urn and a random draw was made. This is how the type of medersa establishment was obtained;
- 2ième degree was to match the size in the statistical table. The type of medersa school drawn had 43,657 students [3]. By matching in the statistical table proposed by Krecjie and Morgan version 2006, for a population of 50,000 (43,657 rounded to 50,000), the sample size is 381 for a 95% confidence interval with a margin of error of 5%.
- 3ième degree was to do the rule of three to determine the numbers of medersas schools surveyed.

175 schools ⟶ 43657 pupils

x ⟶ 381 students

$$x = \frac{175 \times 381}{43657} = 1.52$$ thus two (2) medersa schools to be surveyed.

- 4ième degree consisted of a random draw to determine the two (2) medersa schools to be surveyed. First, a random draw was carried out to obtain two communes in the five communes of Niamey. Communes 1 and 3 were thus obtained. Then, in each commune, the medersa schools were listed. Finally, a random draw was made to obtain the two schools, Medersa ZAC (commune 1) and Medersa Cité Fayçal (commune 3). The number of pupils is 149 and 201, respectively from the Medersa ZAC and Cité Fayçal schools. As the sample size of 381 was not obtained, a third school was selected. This resulted in the selection of the medersa Karadjé school in commune 5.

➢ *Questionnaire*

The questionnaire used for the interviews concerned the eating habits, anthropometric measurements and identification criteria of the pupils (age, sex, origin, etc.).

➢ *Statistical Analysis*

The data collected was analysed using Excel and SPSS.

ISSN No:-2456-2165

III. RESULTS AND DISCUSSION

A. Results

- *Data on Socio-Demographic Characteristics*

Table 1 presents data on the socio-demographic characteristics of children.

Table 1 Socio-Demographic Characteristics of Children in the Survey Sample

Features	Modalities	Workforce	Percentages
	6-8 years	78	20,5
Age groups (in years)	9-11 years	199	52,2
	≥ 12 years	104	27,3
Sexes	Female	218	57,2
	Male	163	42,8
Child's rank	≤ 4	248	65,09
	> 4	133	34,91
	Drilling	27	7,1
Drinking water	Mineral	2	0,5
	Well	2	0,5
	Tap	350	91,9
Presence of latrine	No	36	9,4
	Yes	345	90,6
Parents' occupation	With profession	244	64,0
	No profession	137	36,0
	Banco	53	13,9
Type of habitat	hard	186	48,8
	floor	6	1,6
	hangar	120	31,5
	villa	16	4,2
	Cité Fayçal	137	36,0
Origin of the students	Karadjé	167	43,8
	ZAC	77	20,2

Table 1 shows that the most represented age group was 9 to 11 years, i.e. 52.2% (n=199). The average age was 9 years with an extreme ranging from 6 to 15 years. Females represented 57.2% (n=218) with a sex ratio of F/M = 1.33. Rank less than or equal to 4 accounted for 65.09% (n=248). Pupils from Karadjé primary school were the most represented with 43.8% (n=167). Tap water was the most consumed by the children at 91.9%. About 90.6% (n=345) of children had a latrine at home. 48.8% of children lived in a permanent building.

- *Anthropometric Data*

Table 2 presents anthropometric data of children.

Table 2 Distribution of Children in the Surveyed Sample According to Anthropometric Data.

Variables	Numbers (n=381)	Percentages
Weight (Kg)		
≤ 19,9	42	11,02
20-20,9	209	54,86
30-30,9	88	23,10
40-49,9	34	8,92
≥50	8	2,10
Size (cm)		
≤ 110,9	7	1,84
111-129,9	160	41,99
130-149,9	170	44,62
≥ 150	44	11,55
Body mass index		
Leanness	65	17,06
Normal	282	74,02
Overweight	26	6,82
Obesity	8	2,10

The most represented weight range was 20-20.9 kg with 54.86% and an average of 28.77 kg with extremes ranging from 14.8-70.7 kg.

The most represented height range was 130-149.9 cm with 44.62% and an average of 133.39 cm with extremes ranging from 104.9-165.9 cm.

The number of students with abnormal body mass index was 25.98% of which 17.06% of the students were lean, 6.82% were overweight and 2.10% of the students were obese. The average Body Mass Index (BMI) was 15.84 kg/m² with the extremes ranging from 9.77-38.16 kg/m² for both sexes.

➢ *BI-Varied Analyses*

Table 3 shows the relationship between nutritional status and gender.

Table 3 Distribution of School-Age Children in Niamey By Gender According to Nutritional Status in 2021.

Variables	**Nutritional status**									
	Leanness		Normal		Obesity		Overweight		Total	
	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Sexes										
F	26	6,82	173	45,41	6	1,57	13	3,41	218	57,22
M	39	10,24	109	28,61	2	0,52	13	3,41	163	42,78
Total	65	17,06	282	74,02	8	2,10	26	6,82	381	100

- P=0.009, the results are statistically significant and will therefore not be considered a chance event and will not be produced solely because of an error.
- The study showed that female children were the most represented with 6.82% (n=40) cases of thinness and 1.56% (n=6) cases of obesity.

➢ *Table 4 Shows the Relationship Between Nutritional Status and the Age Range of the Children.*

Table 4 Distribution of School-Age Children in Niamey by Age Group According to Nutritional Status in 2021.

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Age range in years										
6-8	2	0,52	63	16,54	11	2,89	2	0,52	78	20,47
9-11	26	6,82	156	40,94	12	3,15	5	1,31	199	52,23
≥12	37	9,71	63	16,54	3	0,79	1	0,26	104	27,30
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0.0001, the results are statistically significant.
- The 9 to 11 age group was the most represented with 6.82% (n=26) cases of underweight, 3.15% (n=12) cases of overweight and 1.31% (n=5) cases of obesity.

➢ *Table 5 Shows the Relationship Between Nutritional Status and Sibling Rank*

.

Table 5 Distribution of School-Age Children in Niamey by Sibling Rank According to Nutritional Status in 2021

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Rank										
≤4	43	11,29	181	47,51	17	4,46	7	1,84	248	65,09
≥ 4	22	5,77	101	26,51	9	2,36	1	0,26	133	34,91
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,595
- No significant differences were observed.
- Children belonging to rank 4 or below were the most represented and nutritionally unbalanced: 11.29% (n=43) were underweight, 4.46% (n=17) were overweight and 1.84% (n=7) were obese.

ISSN No:-2456-2165

➢ *Table 6 Shows the Relationship Between Nutritional Status and Parents' Occupation*

Table 6 Distribution Of School-Age Children In Niamey By Parents' Occupation According To Nutritional Status In 2021

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		obesity		Total	
	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Father's occupation										
With profession	45	11,81	178	46,72	17	4,46	4	1,05	244	64,04
No profession	20	5,25	104	27,30	9	2,36	4	1,05	137	35,96
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0.669, no significant difference is observed.
- The study showed that children whose parents had an occupation were the most represented, with 11.81% (n=45) of them being underweight, 4.46% (n=17) overweight and 1.05% (n=4) obese.

➢ *Table 7 Shows the Relationship Between Nutritional Status and where the Children come from.*

Table 7 Distribution of School-Age Children in Niamey According to their Origin and Nutritional Status in 2021

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
Origin of the children	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Cité Fayçal	26	6,82	96	25,20	10	2,62	5	1,31	137	35,96
Karadjé	31	8,14	124	32,55	11	2,89	1	0,26	167	43,83
ZAC	8	2,10	62	16,27	5	1,31	2	0,52	77	20,21
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100,00

- P=0,363
- No significant differences were observed.
- Children from Karadjé school were the most represented with 8.18% (n=31) cases of underweight, 2.89% (n=11) cases of overweight and 0.26% (n=1) cases of obesity.

➢ *Table 8 Shows the Relationship Between the Nutritional Status and the Type of Housing of Children*

Table 8 Distribution of School-Age Children in Niamey According to their Type of Housing by Nutritional Status in 2021.

Variables	**Nutritional status**									
	Leanness		normal		Overweight		Obesity		Total	
Habitat types	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Banco	10	2,62	39	10,24	3	0,79	1	0,28	53	13,91
Endure	33	8,66	135	35,43	14	3,67	4	1,05	186	48,82
Floor	3	0,79	2	0,52	1	0,26	0	0,00	6	1,57
Hangar	15	3,94	94	24,67	8	2,10	3	0,79	120	31,50
Villa	4	1,05	12	3,15		0,00	0	0,00	16	4,20
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,860
- No significant differences were observed.
- Children with an endured home were the most represented with 8.66% (n=33) cases of underweight, 3.67% (n=14) cases of overweight and 1.05% (n=4) cases of obesity.

➢ *Table 9 Shows the Relationship Between Nutritional Status and Children's Usual Breakfast Intake.*

Table 9 Distribution of School-Age Children in Niamey According to their Breakfast Eating Habits by Nutritional Status in 2021.

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
Breakfast eating habits	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Never	2	0,52	2	0,52		0,00		0,00	4	1,05
Sometimes	12	3,15	27	7,09	2	0,52	2	0,52	43	11,29
always	51	13,39	253	66,40	24	6,30	6	1,57	334	87,66
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

ISSN No:-2456-2165

- P=0,035
- No significant differences were observed.
- Children who always ate breakfast were the most represented with 13.39% (n=51) cases of underweight, 6.30% (n=24) cases of overweight and 1.57% (n=6) cases of obesity.

➢ *Table 10 Shows the Relationship Between Nutritional Status and Children's Usual Breakfast Intake.*

Table 10 Distribution of School-Age Children in Niamey According to their Lunch time Eating Habits by Nutritional Status in 2021

Variables	**Nutritional status**									
	Leanness		**Normal**		**Overweight**		**Obesity**		**Total**	
Eating habits at lunch	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Sometimes	2	0,52	9	2,36	0	0,00	0	0,00	11	2,89
Always	63	16,54	273	71,65	26	6,82	8	2,10	370	97,11
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,776
- No significant differences were observed.
- Children who always ate at lunch were the most represented with 16.54% (n=63) cases of underweight, 6.8% (n=26) cases of overweight and 2.10% (n=8) cases of obesity.

➢ *Table 11 Shows the Relationship Between Nutritional Status and Children's Usual Dinner Intake*

Table 11 Distribution of School-Age Children in Niamey According to their Eating Habits at Dinner by Nutritional Status in 2021

Variables	**Nutritional status**									
	Leanness		normal		overweight		Obesity		Total	
Eating habits at dinner	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Never		0,00	1	0,26	0	0,00	0	0,00	1	0,26
Sometimes	1	0,26	8	2,10	0	0,00	0	0,00	9	2,36
Always	64	16,80	273	71,65	26	6,82	8	2,10	371	97,38
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,668
- No significant differences were observed.
- Children who always ate at dinner were the most represented with 16.8% (n=64) cases of underweight, 6.82% (n=26) cases of overweight and 2.10% (n=8) cases of obesity.

➢ *Figure 2 Illustrates the Relationship Between Nutritional Status and the Reason for Eating Breakfast for Children*

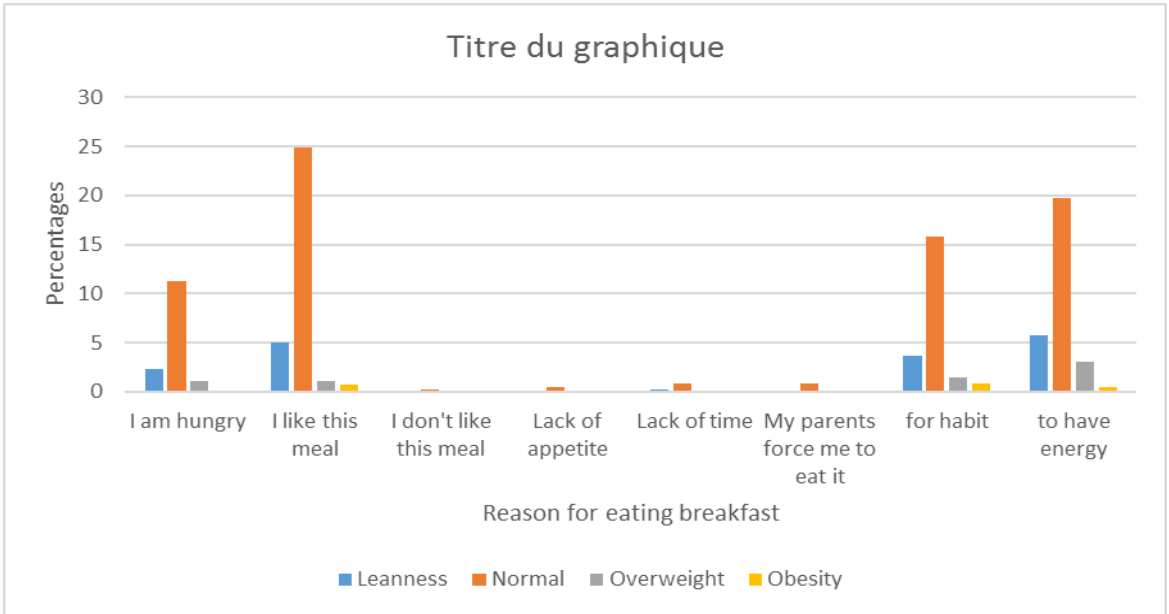

Fig 2 Distribution of school-age children in Niamey according to their reason for eating breakfast by nutritional status in 2021.

- P=0,371
- No significant differences were observed.
- Children who liked to eat breakfast were the most represented with 4.99% being underweight, 01.05% overweight and 0.79% obese.

➢ *Figure 2 Illustrates the Relationship Between Nutritional Status and where Children Eat Breakfast*

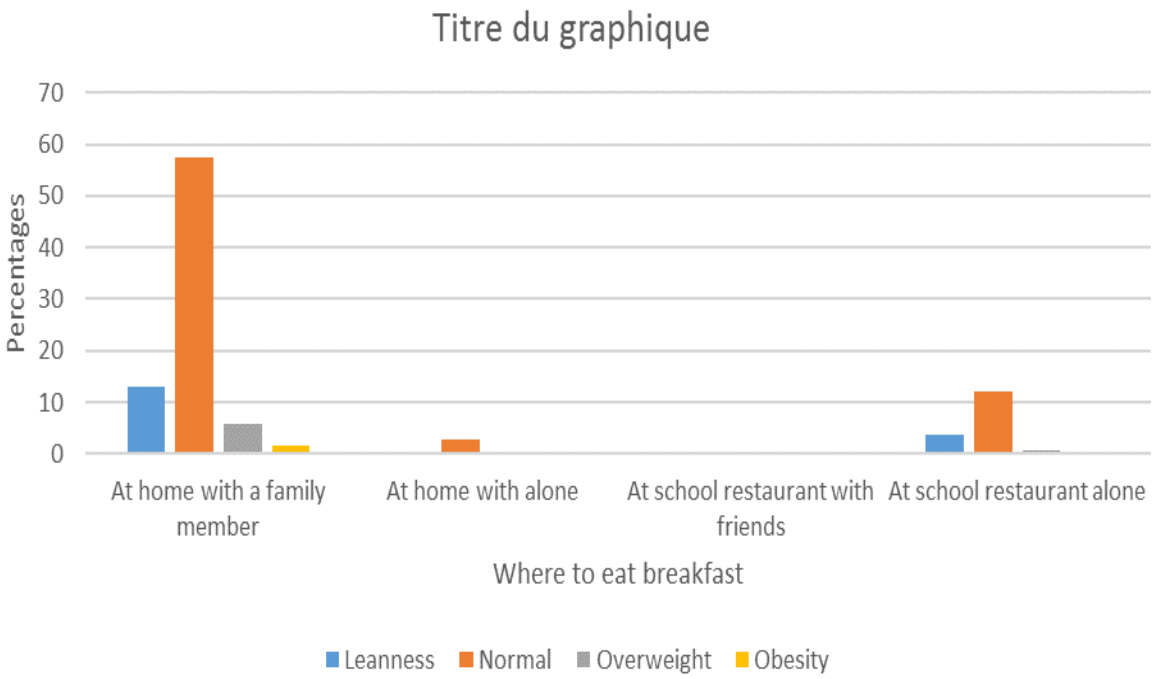

Fig 3 Distribution of school-age children in Niamey according to where they eat breakfast by nutritional status in 2021

- P=0,735
- No significant differences were observed.
- Children who used to have breakfast at home with a family member were the most represented with 13.21% being under-weight, 5.77% overweight and 1.57% obese.

➢ *Table 12 Shows the Relationship Between Nutritional Status and where Children Eat Breakfast.*

Table 12 Distribution of School-Age Children in Niamey According to where they Eat Breakfast by Nutritional Status in 2021

Variables	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
Where to eat lunch	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
At home with a family member	60	15,75	243	63,78	25	6,56	7	1,84	335	87,93
At home alone	5	1,31	39	10,24	1	0,26	1	0,26	46	12,07
Grand total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,303
- No significant differences were observed.
- Children who used to have lunch at home with a family member were the most represented with 15.75% (n=60) cases of underweight, 5.56% (n=25) cases of overweight and 1.84% (n=7) cases of obesity.

➢ *Table 13 Shows the Relationship Between Nutritional Status and the Number of Meals Eaten Per Day by the Children Surveyed.*

ISSN No:-2456-2165

Table 13 Distribution of School-Age Children in Niamey According to the Number of Meals Consumed Per Day by Nutritional Status in 2021

Variables	Nutritional status									
	Leanness		Normal		Overweight		Obesity		Total	
Number of dishes per day	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
2 courses	2	0,52	8	2,10	0	0,00	1	0,26	11	2,89
3 courses	17	4,46	73	19,16	6	1,57	1	0,26	97	25,46
4 courses	46	12,07	201	52,76	20	5,25	6	1,57	273	71,65
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,854
- No significant differences were observed.
- Children who ate four meals were the most represented with 12.07% (n=46) being underweight, 5.25% (n=6) being overweight and 1.57% (n=6) being obese.

➢ *Table 14 Shows the Relationship Between the Nutritional Status of the Children Surveyed and the Influence of Food Provenance on their Choices.*

Table 14 Distribution of School-Age Children in Niamey According to Choice of Food Source by Nutritional Status in 2021

Variables	Nutritional status									
	Lean Normal Overweight Obese Total									
Choice/Provenance	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Never	55	14,44	255	66,93	25	6,56	8	2,10	343	90,03
Sometimes	7	1,84	11	2,89	0	0,00	0	0,00	18	4,72
Often	3	0,79	14	3,67	1	0,26	0	0,00	18	4,72
Always		0,00	2	0,52	0	0,00	0	0,00	2	0,52
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,601
- No significant differences were observed.
- Children who never paid particular attention to the origin of food before making their choice were the most represented with 14.44% (n=55) cases of underweight, 6.56% (n=25) cases of overweight and 2.10% (n=8) cases of obesity.

➢ *Table 15 Shows the Relationship Between Nutritional Status and Food Intolerance in Children.*

Table 15 Distribution of School-Age Children in Niamey According to their Food Intolerance and Nutritional Status in 2021

Variables	Nutritional status									
	Leanness		Normal		Overweight		Obesity		Total	
Food intolerance	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
No	63	16,54	265	69,55	25	6,56	8	2,10	361	94,75
Yes	2	0,52	17	4,46	1	0,26	0	0,00	20	5,25
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,683
- No significant differences were observed.
- Children with no food intolerance were the most represented with 16.54% (n=63) being underweight, 6.56% (n=25) overweight and 2.10% (n=8) obese.

➢ *Table 16 Shows the Relationship Between Nutritional Status and the Presence of Oral Problems in Children*

Table 16 Distribution of School-Age Children in Niamey According to their Oral Health Problems by Nutritional Status in 2021

Variables	Nutritional status									
	Leanness		Normal		Overweight		Obesity		Total	
Dental problems	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
No	64	16,80	271	71,13	26	6,82	8	2,10	369	96,85
Yes	1	0,26	11	2,89	0	0,00	0	0,00	12	3,15
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

ISSN No:-2456-2165

- P=0,539
- No significant differences were observed.
- Children who did not have oral problems were the most represented with 16.80% (n=64) being underweight, 6.82% (n=26) overweight and 2.10% (n=8) obese.

➢ *Table 17 Shows the Relationship Between Nutritional Status and the Type of Drinking Water Consumed by the Children in the Survey Sample.*

Table 17 Distribution of School-Age Children in Niamey by Type of Drinking Water Consumed According to Nutritional Status in 2021

Variable	**Nutritional status**									
	Leanness		Normal		Overweight		Obesity		Total	
Type of water	Workforce	%	Workforce	%	Workforce	%	Workforce	%	Workforce	%
Drilling	3	0,79	21	5,51	2	0,52	1	0,26	27	7,09
Mineral	0	0,00	1	0,26	1	0,26	0	0,00	2	0,52
Well	0	0,00	1	0,26	1	0,26	0	0,00	2	0,52
Tap	62	16,27	259	67,98	22	5,77	7	1,84	350	91,86
Total	65	17,06	282	74,02	26	6,82	8	2,10	381	100

- P=0,630
- No significant differences were observed.
- Children who drank tap water as drinking water were the most represented with 16.27% (n=62) cases of underweight, 5.77% (n=22) cases of overweight and 1.84% (n=7) cases of obesity.

IV. DISCUSSION

➢ *In This Study, 381 Students Were Surveyed.*

- *Data on Measurements and Anthropometric Indices*

The number of students with abnormal body mass index was 25.98% of which 17.06% of the students were lean, 6.82% overweight and 2.10% obese. These results are lower than those of Soumana A et *al* [4] in 2020 in Niger who found that the prevalence of overweight was 15.5%, divided into 6% obese and 9.5% overweight. Similarly, these results are lower than those of El Khouri [5] in 2016 in Burkina Faso who found in his study that the prevalence of thinness is 8.4% and that of overweight is 3.7%.

The study shows that the average Body Mass Index (BMI) was 15.84 kg/m² with extremes ranging from 9.77-38.16 kg/m² for both sexes combined. On the other hand, these results are lower than those of Alhassane [6] in 2019 in Mali who found in his study that the average BMI was 21.7 kg/cm² with extremes ranging from 14.56 to 33.33 kg/cm². This could be explained by the fact that school-age children are physically active, which helps them to control their weight.

- *BI-Various Analyses*

The study found that female children were the most represented with 6.82% (n=40) cases of underweight, 1.56% (n=6) cases of obesity. P=0.009, the results are statistically significant and therefore will not be considered as a chance event and will not be produced only because of an error. This result is comparable to that of the MEP/A/PLN/EC [3] in 2015 in Niger which found that girls represented more than half (50.8%) of the primary school enrolment in Niamey. This predominance of the female gender could be explained by the fact that in Niamey, an urban environment, parents perceive school as a means for their daughters to build their future. According to a study conducted by Achouri I et *al* [8] in 2016 in Morocco, the prevalence of underweight cases is 2.3% in girls and no significant association was observed between gender and the nutritional status of children.

The 9 to 11 age group was the most represented with 6.82% (n=26) cases of underweight, 3.15% (n=12) cases of overweight and 1.31% (n=5) cases of obesity. P=0.0001, the results are statistically significant. This result is different from that of Elidrissi et *al* [9] 2010 in Morocco who found that the age group of children aged 9-12 years was 54%. Similarly Alhassane [6] in 2019 in Mali found in his study that students in the age group of 19-20 years were the leanest, i.e. 19 cases of leanness. This finding could be explained by the age at which the children enrolled in primary school.

Children belonging to rank 4 or below were the most represented and nutritionally unbalanced, i.e. 11.29% (n=43) were underweight, 4.46% (n=17) were overweight and 1.84% (n=7) were obese. This is due to the fact that the size of the household can influence the nutritional status.

The study showed that children whose parents had a job were the most represented, with 11.81% (n=45) of them being underweight, 4.46% (n=17) overweight and 1.05% (n=4) obese. This could be explained by the fact that the urban environment is a place where one benefits more from employment conditions

Children at Karadjé school were the most represented, with 8.18% (n=31) cases of underweight, 2.89% (n=11) cases of overweight and 0.26% (n=1) cases of obesity. This can be explained by the fact that the enrolment in Karadjé school is higher than in the ZAC and Cité Fayçal primary schools. In addition, the Karadjé primary school students

ISSN No:-2456-2165

were the most likely to agree with the inclusion criteria of the study.

Children with a hardened house were the most represented with 8.66% (n=33) cases of thinness, 3.67% (n=14) cases of overweight and 1.05% (n=4) cases of obesity. This could be explained by the high prevalence of permanent building materials in the city.

Children who always ate breakfast were the most represented, with 13.39% (n=51) of them being underweight, 6.30% (n=24) overweight and 1.57% (n=6) obese. This is due to the fact that eating breakfast favours a better quality of nutrition in children.

Children who always ate at dinner were the most represented with 16.8% (n=64) cases of underweight, 6.82% (n=26) cases of overweight and 2.10% (n=8) cases of obesity. This is due to the fact that dinner is the last meal of the day and if it is light and rich in nutritional quality, it can reduce the risk of obesity.

Children who liked to eat breakfast were the most represented with 4.99% being underweight, 01.05% overweight and 0.79% obese. This could be explained by the fact that breakfast is a way to increase the recommended daily intake of essential nutrients.

Children who used to have breakfast at home with a family member were the most represented with 13.21% being underweight, 5.77% overweight and 1.57% obese. Breakfast is the most important meal of the day and contributes significantly to the daily need for nutrition and energy. In children, its consumption may be associated with learning and better school performance.

Children who usually eat lunch at home with a family member were the most represented, with 15.75% (n=60) cases of leanness, 5.56% (n=25) cases of overweight and 1.84% (n=7) cases of obesity. This could be explained by the fact that in Niger, meals are eaten collectively in the family. This behaviour may be due to a lack of resources which means that the children have no choice but to eat the family meal or the pupil never eats food outside the family.

Children who never paid attention to the origin of food before making their choice were the most represented with 14.44% (n=55) cases of underweight, 6.56% (n=25) cases of overweight and 2.10% (n=8) cases of obesity. This is due to a lack of awareness about quality food.

Children who had eaten four meals were the most represented, with 12.07% (n=46) cases of leanness, 5.25% (n=6) cases of overweight and 1.57% (n=6) cases of obesity. This can be explained by the fact that in Niger, usually three meals (breakfast, lunch and dinner) are taken per day. A fourth meal was often accompanied by a snack during the break, commonly called "recreation" on weekdays. These results are lower than those of Soumana A et *al* [4] in Niger in 2020 who found in their study that the prevalence of obesity and overweight among those who ate more than three meals a day is 28.4%. Similarly, these results are beyond that of the CILSS [10] in 2004 on the consumption norms of the main food products which found that 70% of urban households have three meals a day.

Children who never paid attention to the origin of food before making their choice were the most represented with 14.44% (n=55) cases of underweight, 6.56% (n=25) cases of overweight and 2.10% (n=8) cases of obesity. This is due to a lack of awareness about healthy eating.

Children with no food intolerance were the most represented with 16.54% (n=63) being underweight, 6.56% (n=25) overweight and 2.10% (n=8) obese. Food intolerances can have an impact on the nutritional status of children.

Children who did not have oral problems were the most represented with 16.80% (n=64) being underweight, 6.82% (n=26) being overweight and 2.10% (n=8) being obese. Oral problems can influence food consumption.

Children who drank tap water as drinking water were the most represented with 16.27% (n=62) cases of underweight, 5.77% (n=22) cases of overweight and 1.84% (n=7) cases of obesity. This could be explained by the fact that the urban environment is a place where one benefits more from employment conditions.

V. CONCLUSION

We conducted a survey to assess the eating habits and nutritional status of school children. Our study showed that the overall prevalence of thinness was 17.06%, overweight was 6.82% and obesity was 2.10%. Children who used to have breakfast at home with a family member were the most represented with 13.21% being underweight, 5.77% overweight and 1.57% obese. A significant association was observed between the two sexes of the children and their nutritional status (P=0.009) and between the age of the children and their nutritional status.

In sum, despite the efforts of the State in the field of nutrition and child health, malnutrition remains a major public health problem in Niger.

REFERENCES

[1]. Pierre C. and Fabrice E. Analyse des comportements de consommation alimentaire: l'apport du marketing et des sciences économiques.281p.disponible sur https://www.hal.inrae.fr/hal-02817141. 2010

[2]. Word Urbanization Prospect**.** Niamey Population. Retrieved from. 2021

[3]. Ministry of Primary Education, Literacy, National Language Promotion and Civic Education Basic Education and Literacy Statistics. *Yearbook* 2020-2021. 47-52p.

ISSN No:-2456-2165

[4]. Soumana A., Samaila A., Kamaye M., Sadaou A., Garba M., Mamoudou AD, Mahamane Sani MA, Sako Y. Overweight and obesity in urban schools in Niamey (Niger). Rev. Malg. 2020. Ped ; 4(2) ; 39-44p.

[5]. El Khouri E. Impact study: comparison and analysis of anthropometric and biological data of school children in Burkina Faso. *Memoir*. University of Montreal. 2016.Version 5.8.32-76p.

[6]. Alhassane C. Nutritional status of students residing on the campuses of the Faculties of Medicine and Odontostomatology, and the Faculty of Pharmacy of Mali in 2019. University of sciences, techniques and technologies of Bamako. 2019. *Thesis* .110p.

[7]. Achouri I, Aboussaleh Y, Ahami A. Nutritional status and food consumption of school children in Kenitra (Northwest Morocco). 2016. Antropo, 35, 111-117p. Available at www.didac.ehu.es/antropo

[8]. Elidrissi Slitine N., Elmotia F., Bennaoui F., Bouhouch S., Cherkaoui M., Amor H., Baali A., Vimard Patrice, Aboussad A. Nutrition in rural school children in Haouz Marrakech. 2010. *The Maghreb Review*, 35 (4), 416-428p.18/12/2021.Available at https://www.wordpopulationreview.com **.**

[9]. Comité Inter-Etat de Lutte contre la Sècheresse au Sahel.Norme de consommation des principaux produits alimentaires dans les pays de CILSS. 2004. p67.

[10]. Cherkaroui D. Evaluation of nutritional status in children attending public schools in the city of rabat: role of socioeconomic factors. Faculty of Medicine and Pharmacy of Rabat. 2014.*Thesis* N° 09/14CSVS.173p.

- Date of Submission :- 23 Jan 2023
- Date of Acceptance :- 25 Jan 2023
- Date of Publication :- 03 Feb 2023