

# Assessment of Nutritional Status of Students in the Public Schools in Rural Area in the Province of Kenitra

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**ABSTRACT:** Nutritional status is both a reflection of health status and one of its best indicators. It is influenced by several individual, socio-environmental, demographic and economic factors. In our country, undernutrition is still a heavy burden, especially among disadvantaged groups. (This work has two parts) This work is divided to two parts. The first part is about evaluating socio-economic indicators, the second one turns about assesment of the nutritional status of children in primary public schools in the rural municipality of Kariat ben aouda in the province of Kenitra. Our study includes a sample of 138 students in 5th and 6th grades, aged between 10 to 14 years old with an average age of  $11.91 \pm 1.26$  and extremes of 9 and 15 years old, of which 49% are girls (N=68), 51% were boys (N=70), and the value of khi two = 0.029 for the sexe ratio. The majority of the children in our population belong to families that have a low socio-economic level, 39.86% of the fathers householders are peasants. The educational level of the parents remains low only 5.072% of the fathers have a university degree, 37.681% have a secondary level and 45.65% have a primary level. For mothers 88.235% are illiterate, 10.294% have a primary level and 0% have a bac level and up. According to the results, it was concluded that 13.66% (T/A-2z score) with a statutory insufficiency

**Key words:** Based on the study's analysis of nutritional status, the Z-score values are: (-0.432) for T/A, (-0.381) for P/A and (- 1.02) for BMI . According to these values, the population remains undernourished.

## 1.INTRODUCTION

The links between nutrition and health are becoming better known. Malnutrition is a public health problem in the world and particularly in developing countries (FAO, 2012). Malnutrition affects all ages groups, but it's particularly common among low-income people, with lack of access to clean water and without adequate health education (W.H.O, 2000).

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It is generally recognized that malnutrition in children has tragic consequences on their health, including physical and cognitive stunting, disability, morbidity and mortality (Pelletier and Frongillo 2002). Physical growth is a very sensitive indicator of nutritional and health status for infants and children. Food intake, both qualitative and quantitative, must meet growth-related needs (Thibault et al., 2009). Factors that determine the health status of children include the level of parental education, especially of the mother and their socio-economic status (El Hioui et al., 2008). Morocco, like other developing countries, has undergone a nutritional transition in recent decades, marked by a double burden of malnutrition with the coexistence of both types of food deficiency and food excess (Aboussaleh Y and Ahami, 2009). With high rates of unemployment, underemployment and illiteracy in rural areas (HCP 2014), the rural population is facing more malnutrition than obesity. According to the FAO estimation, 12.5% of people have insufficient energy intake, 26% of children suffer from stunting, 2 billion people have a micronutrient deficiency (FAO, 2013)

In Morocco, according to the HCP report, 16.2% of children under 5 years are stunted: 3.1% are underweight and 3% are wasting (HCP, 2011).

The criteria currently recommended by the World Health Organization (WHO) for the diagnosis of malnutrition in adults is the body mass index (BMI, body weight in kilograms divided by the square of the height in metres) without prejudging the acute or chronic nature of this malnutrition (WHO, 1995)

The objective of this study is to measure and calculate the anthropometric parameters of children in school and to assess the possible links between the socio-economic levels of families and the nutritional status of their children living in rural areas of the Kenitra province. In this population, the determination of the acute or chronic nature of malnutrition is made by the use of different indexes: weight-height (P/T) and height-age (T/A) respectively

## 1-STUDY ENVIRONMENT

The municipality of Kariat ben aouda is one of the 17 rural communes of the province of Kenitra, it is located 90 km from the city of kenitra . According to the RGHP 2014: the total population of the municipality is 11087 inhabitants with an average household size of 5.8 inhabitants/household; the most dominant age range is between 15 and 59 years, represented by 59.6%. For basic infrastructure, the connection of households to the electricity network is 93.7% and only 0.3% are connected to the drinking water network.



The municipality has a single health centre and 12 primary schools. The literacy rate by sex is 36.5% for males versus 61% for females. The labour force rates for males and females are 80.9% and 15.8% respectively. The climate is Mediterranean with dry summer, the annual average temperature is 18.4°C and the precipitations are on average 600.2 mm/year. The target population is students in the 5th and 6th grade of five public schools (Foqra, Marja, Oulad Abdellah, Traat and Oued Maleh). The sample included 138 individuals of which 49% are girls (N=68) and 51% are boys (N=70), aged between 10 to 14 years with an average age of 11.91 years +1.26 years) and extremes of 9 and 15 years. The majority of students have to walk more than 1.5 km to get to school.

**II.METHODOLOGY**

The data collection techniques used are the individual questionnaire survey with anthropometric measurements of the students. For each child the weight and height were measured using standard techniques using a new mechanical scale with an accuracy of 0.5 Kg, the height was measured using a fleece with an accuracy of 0.1 cm. The values ( T/A, P/A and IMC) were used to assess their nutritional status using the Anthro+ software. The questionnaire allowed to collect information on the demographic and socio-economic characteristics of households (age, sex, household size, sibling status, educational attainment, occupation of parents . . .), eating habits, number of meals per day and snacks. Students undergoing medical treatment during the study

period and those suffering from metabolic disease are excluded from the study in order to focus research and increase relevance.

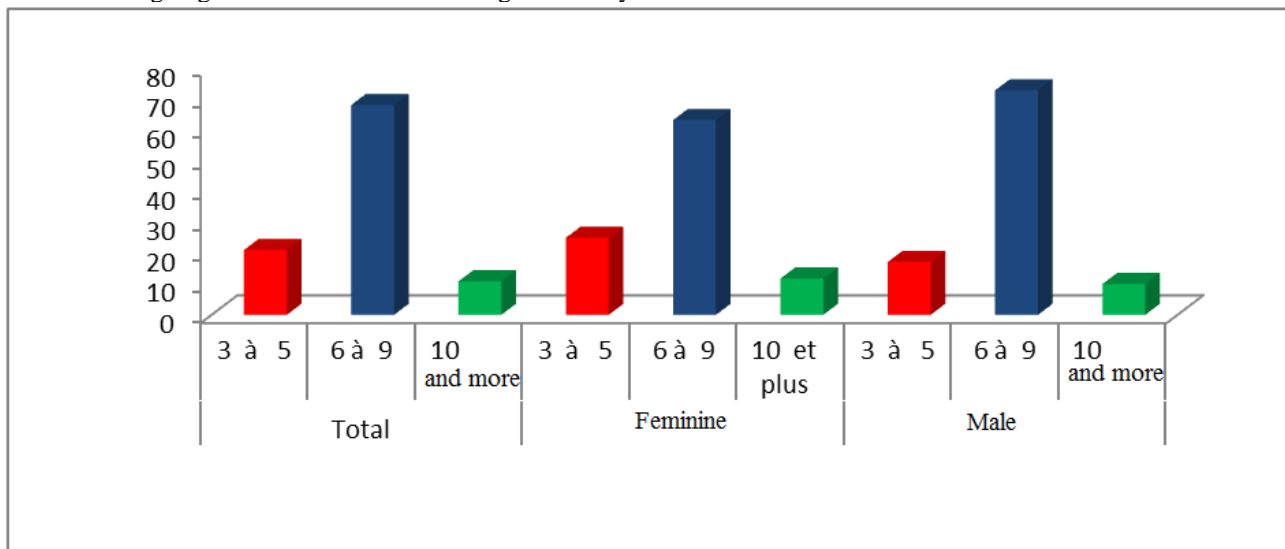
**III.RESULTS AND DISCUSSIONS**

**III-1- Socio-economic and demographic factors**

The socio-economic status of parents are an independent risk factor for the health status of individuals (Galobardes. B et al 2000). The most commonly used indicators of socio-economic status are education, occupation and income (Liberatos. P et al 1988).

**III-1-1-Household size**

According to the analysis of the household structure (Figure 1), households with 3 to 5 persons represent 21.01% of the total population surveyed with 25% of the female population and 17.14% of the male population. On the other hand, the larger household of 6 to 10 people represents 68% of our sample with 63.25% girls and 72.85% boys. Situations of malnutrition arise from the difficulties of families in ensuring their food security when household size is high ( WHO/UNICEF; 1992). The risk of being stunted is strongly correlated with the number of people living in the household  $R = 0.74$ . Some studies have found that the risk of stunting is lower for small households but with no significant difference from large households (INSHA.2008 , Yonkeu S et al.2016). Suspected food insecurity in families of more than one person must be analysed according to their financial capacity.



**Figure 1: Household size**

**III-1-2-Function of the head of household**

The most dominant economic activity in the study area is agriculture, of which 39.86% of the fathers of the students surveyed are peasants, only 0.73% are permanent agents. Family income for this population remains

low. Several studies have shown that low family incomes all lead to a nutritional imbalance or even malnutrition. (Akoto, 1985; Dackam, 1990; Aboussaleh and Ahami, 2005; Elhioui et al., 2007).

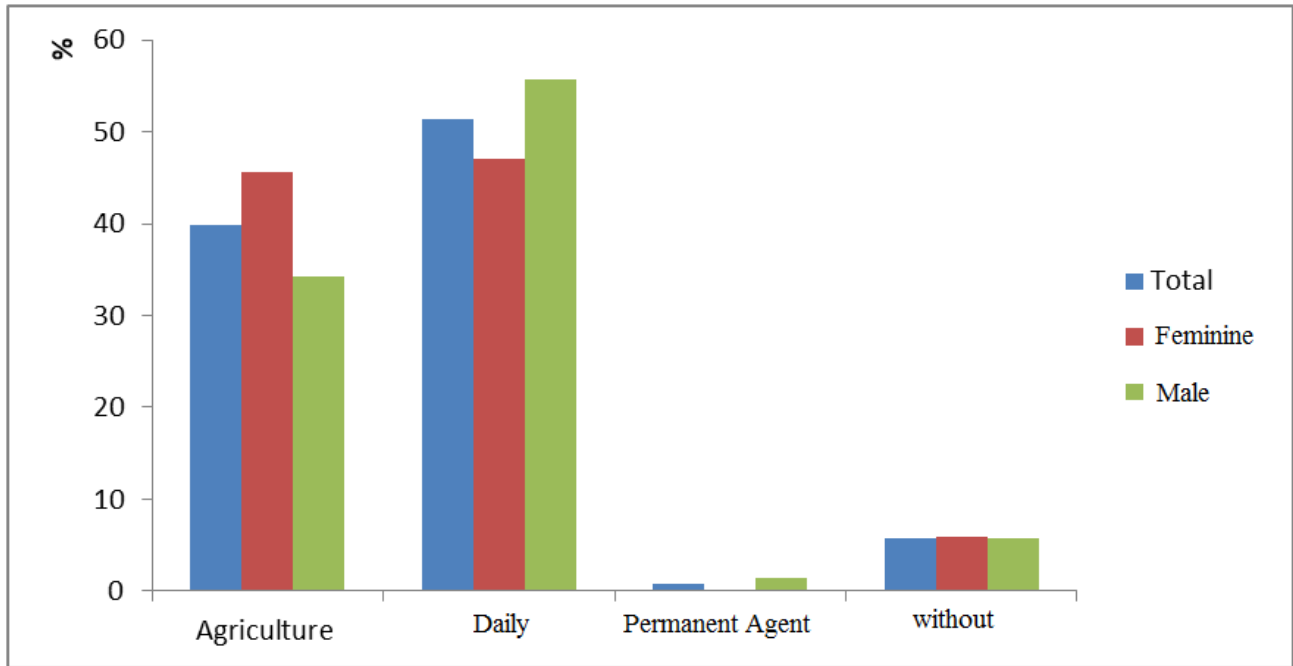


Figure 2: Occupation of parents

III-1-3-Level of training

The results of our study showed that 84.78% of mothers in this population are illiterate and 12.31% have a primary level. This study concurs with several studies that have demonstrated the influence of the mother’s educational level on the child’s nutritional status (Table 1). In this work, it was observed that malnourished children were more common among mothers without education (Aerts D et al.,2004; Cheriyaant and Chirayath MS,1999 and Hacker A, Ryan C, 2003). Similarly the educational level of the father remains low, 45.65% have a primary level and 37.681% have secondary level.

Table 1: Education Level

		Educational level of the father	Educational level of the mother
Female	Illiterate		88,235
	Primary		10,294
	Secondary		1,471
	Bac		0
	University degree		0
Male	Illiterate	1,429	
	Primary	47,143	
	Secondary	32,857	
	Bac	15,714	
	University degree	2,857	

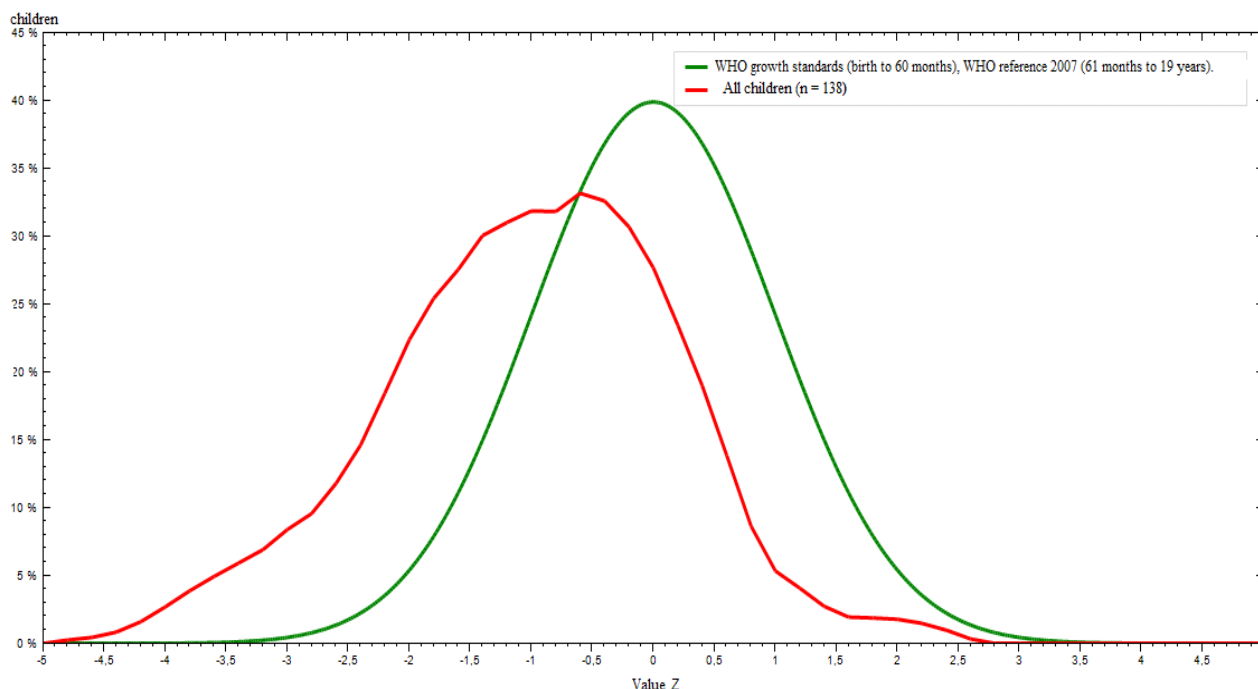
The 1995 Moloua study shows that , the chance of having a normal nutritional status for children whose level of study of fathers with a high secondary level are higher compared to those with a low level of study.

III-2-Anthropometric parameter

III-2-1-Height for age

The age size ratio is commonly used to estimate stunting, based on comparison with baseline data (WHO, 2007). The figure shows that the distribution of the Z-score of size for age is shifted to the left compared to the reference population with a degree of flattening of 23.87%, this explains the existence of the subjects in state of statutory insufficiency, so it was noted that 13,66% (T/A;-2 Z score). According to Figure 3, it was concluded that the children suffered from statutory insufficiency.

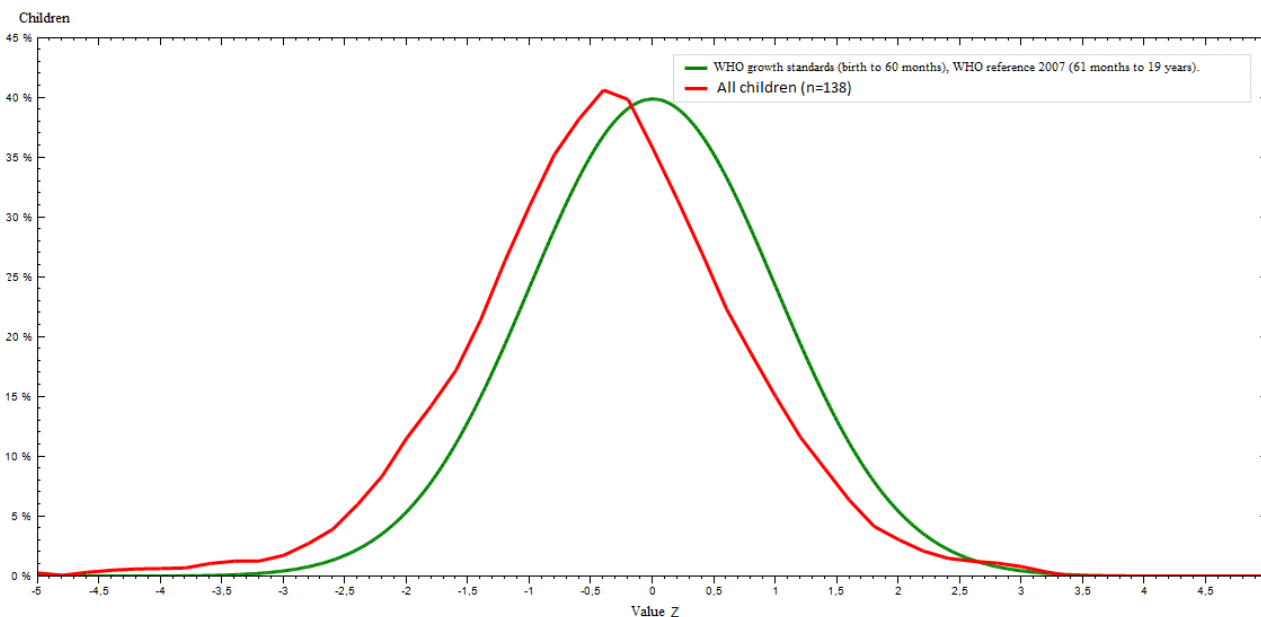




**Figure 3: Age distribution of the Z score of the Taille report**

**III-2-2- Weight for age**

The figure showing the distribution of the age Z-weight score for children in school relative to the reference population with a flattening degree of 0.45%, with an average of 0 (NCHS-CDC, 2002), this explains the existence of subjects who are underweight and thin 6.52% (P/A;-2z score) (Figure 4).



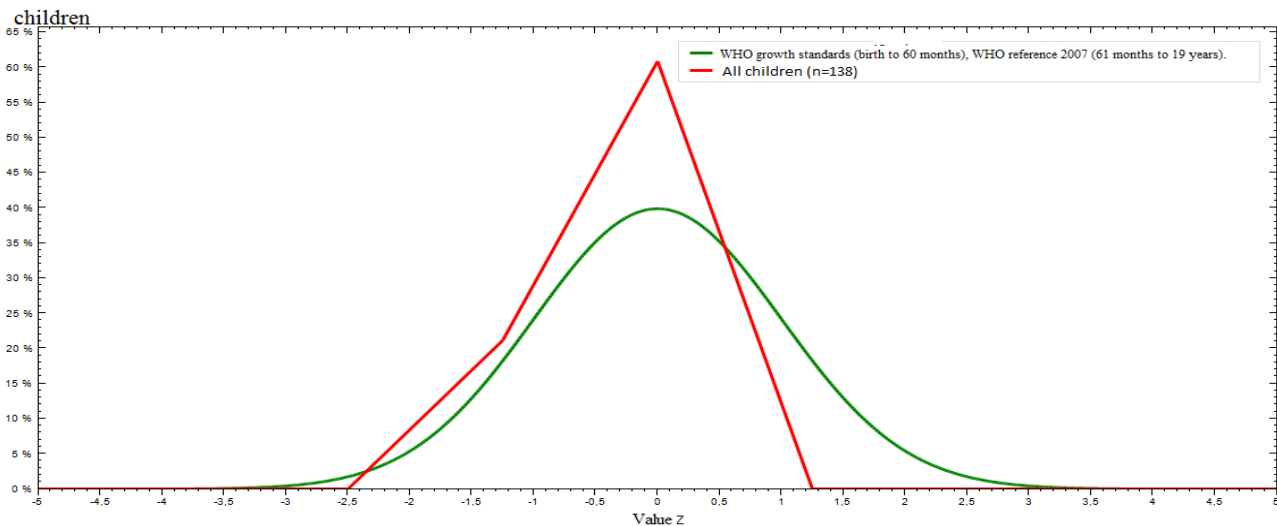
**Figure 4 : Z score distubution of the ratio of weight to age**

**III-2-3- Z-Score IMC**

Measuring and interpreting children growth is very important for assessing the level of individual and collective health of nutritional status. The standards used for comparison purposes vary widely, as do the systems for classifying the growth gap. To compare the size/age and weight/age ratios to the baseline data, we have selected the Z-Score instead of the percentile or the percentage at the median. This method is the recommended approach for comparing distributions of nutritional indices assessed for empirical reference populations (FAO, WHO, 1992 and WHO, 1995).

Figure 5 shows that the population studied is shifted to the left, which shows that it suffers from poor nutrition





**Figure 5: BMI Report Z Score Distribution**

The table shows that the average age of the female subjects is  $140.540 \pm 14.875$  months and the average age of the male subjects is  $145.343 \pm 15.512$  months, The average values of the ratio of z weight score for age in the female subjects is  $34,654 \pm 6,358$ , while for males is  $145,343 \pm 15,512$  months.

#### IV.CONCLUSION

This study shows that the prevalence of chronic malnutrition among school children is high. The level of education of mothers, the socio-economic conditions of families and household size are the associated determinants of children malnutrition in this rural commune of Kenitra province. In the absence of national data on malnutrition in this age group, our results demonstrate the magnitude of this problem. To remedy this situation, the adoption of an approach that combines the assessment of the nutritional status of the school population and their awareness of the risks and threats involved seems obvious as well as the improvement of the financial resources of families.

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