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Article

Influence of Feeding Practices on Malnutrition in Haitian Infants and Young Children

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Abstract: Infant malnutrition remains as an important cause of death and disability, Haiti has the highest prevalence in America, so preventive strategies are needed. Our objective was to assess infant and young children malnutrition in Haiti and to study an association to World Health Organization (WHO) recommended feeding practices adherence. Cross-sectional study of children younger than 2 years old, recruited at Saint Espri Health Center, Port Au Prince (August to September 2014). We registered feeding practices, social and demographic data, and performed anthropometry (WHO-2006 standard). We evaluated 278 infants and young children, 8.08 ± 6.5 months old, 53.2% female. 18.35% had underweight; 13.31% were stunted and 13.67% had moderate or severe wasting. Malnutrition was associated to male gender, older age, lower education of mothers and higher number of siblings. The adherence to WHO recommended practices for breastfeeding was from 11.8 to 97.9% and was related to a lower prevalence of malnutrition. For complementary food, adherence was 9.7 to 90.3%, also associated to lower malnutrition. Conclusion: Prevalence of infant and young children malnutrition in this Haitian Health Center population was high, related to some risk factors. The adherence to WHO recommended feeding practices was associated to a better nutritional status.

Keywords: Breastfeeding, Feeding practices, Infant feeding, Nutrition, Malnutrition, Pediatrics, Primary Health Care.

1. Introduction

Malnutrition is responsible for approximately 35% of infant's death and for 21.2% of the global burden of disease measured as disability-adjusted life years (DALYs) [1, 2]. The long-term consequences of malnutrition convey to poorer intellectual and work capacity, thus perpetuating a poverty cycle over generations. The risk of malnutrition and its impact is highest in early childhood; thus a "window of opportunity" is described between 0 and 23 months of age [3] as the optimal period to prevent the adverse consequences with proper community or facility based treatment. Multiple strategies are effective in preventing and treating infant malnutrition in developing country settings, but supplements [4 – 6] and educational [7 – 10] interventions adapted to local conditions have better results [4 – 10]. The guiding principles for infants and young children developed by the World Health Organization (WHO) in 2003 remain a fundamental strategy [11, 12].

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These include: Practice exclusive breastfeeding from birth to 6 months of age, introduce complementary foods at 6 months of age, continued breastfeeding until 2 years of age or beyond; adequate amount of complementary food, proper food consistency, meal frequency and energy density, enough nutrient content in complementary foods, use of vitamin-mineral supplements or fortified products for infant and mother. Indicators to assess the adherence to these recommendations [13] are associated with a better nutritional outcome [9 – 14].

Infant mortality in Haiti is 77.6 per 1000 live births, the highest in the Western Hemisphere. Although the prevalence of wasting has decreased to 4.1% (Weight / Height < -2 SD) vulnerability and high nutritional risk persists. Moreover, the prevalence of stunting (Height / Age index < -2 SD) is 23.4% in children < 6 years of age [15, 16].

Klinik Saint Espri is a Health Center in the Croix de Bouquetes commune, close to Port Au Prince, operational since 2001 and run by the American non-governmental organization (NGO) Haiti Medical Missions of Memphis [17]. There, malnutrition is a frequent cause for consult and referral to the treatment program, but its magnitude is unknown. The objective of the present study was to assess the prevalence of malnutrition in infants and young children attending to this center, to study the adherence to WHO recommended feeding practices and its association to their nutritional status.

2. Materials and Methods

We conducted a cross-sectional study in Klinik Saint Espri Health Center in September 2014, in a convenience sampling of infants and young children attending the Child Health Programs (Acute morbidity, health check of newborns and infants, vaccination, or malnutrition). We aimed to reach a sample of 200 children, based on a previous estimation of 323 consultations per month. Recruitment was carried out by general and individual invitation in the waiting room. Children younger than 2 years old whose parents agreed to participate, filled completely a survey and signed the consent, were included. Those that required immediate care due to severe diseases or with dehydration where excluded.

We developed a survey for this purpose, translated into Haitian Creole by the medical staff members. Then, it was tested in a pilot study by two interviewers and final adaptations were made (Apendix A). The survey evaluated five items: 1) Identification and general characteristics of the patient; 2) Brief social evaluation; 3) 24-hour Dietary Recall: Done by personal interview once, to each caregiver, for assessing portion size we used common plates and glasses obtained from local businesses and made models of common foods with painted plastic foam (Apendix B). For breastfed infants we could not estimate volume, due to the variety of breastfeeding practices; 4) Use of nutritional supplements during the last week and 5) Additional breastfeeding questions like age at first time breastfeed, exclusive breastfeeding duration, age at introduction of solids and age of weaning breastfeeding. The survey was conducted privately, in an individual room by one of five trained interviewers; two were center 'staff and three were voluntaries, all spoke fluent Haitian Creole. After the survey was completed, standardized anthropometry was performed, and the nutritional diagnosis was communicated to the child's guardian. Children with wasting were immediately derived to the center's malnutrition program. Daily reviews of the surveys were carried out to detect duplications and mistakes. Based on the information reported in the survey, specifically the 24-hour dietary recall, indicators of feeding practices where calculated; based on the methodology proposed by OMS [13].

Anthropometry: Children were weighted naked with a calibrated infant balance. An infantometer was used to measure supine length, with the head supported at one end, the torso and lower limbs extended, and feet flexed to 90° and supported by the lower end stopper, approaching 0.1 cm. Head circumference was measured with and non-extensible metric tape, fixed on the occiput, passing around the head, above the supraorbital ridges. Mid-brachial arm circumference was loosely measured at the mid-point between the acromion and the olecranon with the same inextensible tape. The 2006 WHO Child Growth Standard was used; z-scores were calculated with Anthro® program [18]: for Weight/Age (zW/A), Lengtht/Age (zL/A), Weight/Length (zW/L), Head circumference/Age

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(zHC/A), and Mid-brachial circumference/Age (zBC/A) [19]. The presence of edema was recorded. We used 2006 WHO classification for nutritional status (Table 1). The zBC/A was considered abnormal if it was < -2, and alternatively if it measurement was < 125 mm.

Adherence to indicators of feeding practices: After the application of the survey and before defining the nutritional status, the principal investigator (BI) calculated the indicators according to children's age and WHO 2010 criteria [13].

Statistical analyses: Descriptive statistics of numerical variables was performed; distribution was verified by the Anderson Darling test. Variables were expressed as mean (± SD) or median (Ranges). Parametric (Student's t-test) or non-parametric (Mann-Whitney) tests were used to compare results. Prevalences were compared according to sex and age (Chi2 test) and univariate correlation analysis were carried out. We evaluated the association between adherence to feeding practices and nutritional status with Chi2 test. We used MINITAB-17® statistical program and $p < 0.05$ was considered significant.

Ethics: The Research Ethics Committee of the Faculty of Medicine, Pontificia Universidad Católica de Chile, approved this study. In addition, medical directors of the Klinik Saint Espri Health Center, and the Haitian ambassador in Chile also approved it. All parents or guardians signed a written informed consent form, written in Creole. If the guardian was illiterate, a trusted person read the consent form.

3. Results

We assessed 278 infants, aged 8.08 ± 6.5 months (Range: 13 days to 25 months), 41% younger than 6 months old, 31% from 6 to 12 months and 28% from 13 to 25 months. Overall, 53.2% were female. Most caregivers (70.77%) reported living in the area where the Health Center is located, Croix de Bouquetes. The remaining came mainly from the Bon Repò and Canaan sectors, where the camps of the displaced population following the 2010 earthquake are concentrated. Only 17.9% reported living in camps and/or housing made from lightweight material. Parental employment: 34.5% reported having formal or informal jobs, mostly small-scale trade. Maternal median age was 28 years (16 to 46 years), 43.5% completed primary education and 6.5% never attended to school. Upon request, 15.35% of caregivers failed to sign their names (Illiterate). 35.7% of mothers reported having one child, 41.8% between two and three children, and 22.5% four or more.

3.1 Prevalence of Malnutrition:

Table 1 shows the prevalence of malnutrition according to different indexes. We observed a displacement of the curves to the left in the distribution of the different anthropometric indexes relative to WHO standard, both globally and by groups according to age and sex (figures 1, 2). Only 30.6% of the infants with zW/L <-2 SD (With acute malnutrition or wasted) were registered in the Malnutrition Program of the Health Center. No one had edema.

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147 **Table 1:** Nutritional status in 278 infants that attended the Klinik Saint Espri Health Center,
148 Port au Prince, Haiti (August – September 2014).
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Anthropometric index	Nutritional diagnosis	Degree	Z-score	Prevalence (%)
Weight/Age	Underweight	Severe	z W/A ≤ -3	6.12
		Moderate	z W/A -2 to -3	12.23
	Normal		z W/A -1 to -2	26.26
			z W/A -1 to +1	47.84
			z W/A +1 to +2	6.12
	Overweight		z W/A ≥ +2	1.44
Weight/Length	Wasting	Severe	z W/L <-3	3.60
		Moderate	z W/L -2 to -3	10.07
	Normal		z W/L -2 to -1	24.82
			z W/L -1 to +1	52.52
		Risk of overweight	z W/L +1 to +2	7.55
	Overweight		z W/L > +2	1.44
	Obesity		z W/L > +3	0.36
Length/Age	Stunting		z L/A < -2	13.31
	Normal		z L/A -2 to +2	85.25
	Tall		z L/A > +2	1.44
Head circumference / Age	Microcephaly		z HC/A <-2	10.80
	Normal		z HC/A -2 to +2	86.68
	Macrocephaly		z HC/A > +2	2.52
Brachial Circumference / Age	Low		z BC/A < -2	4.67
	Normal		z BC/A > -2	95.33

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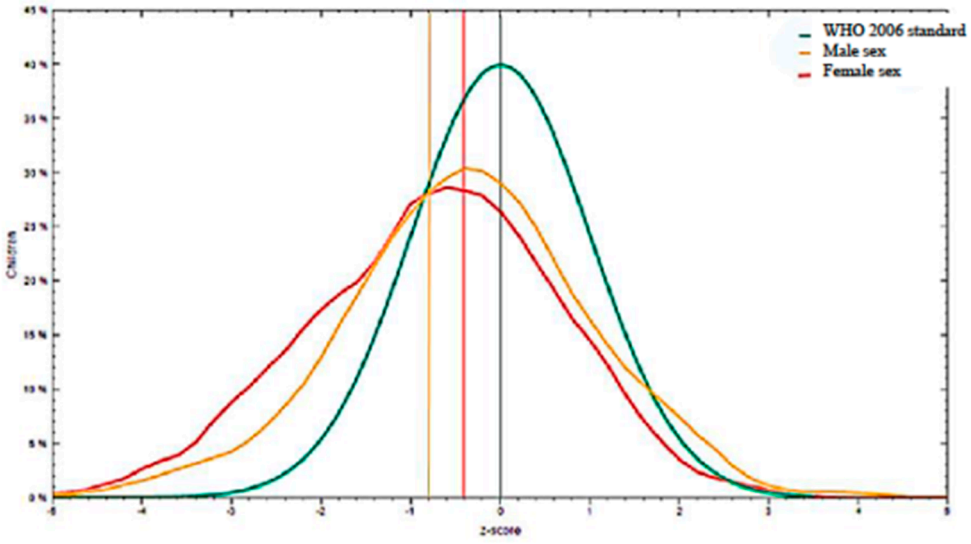
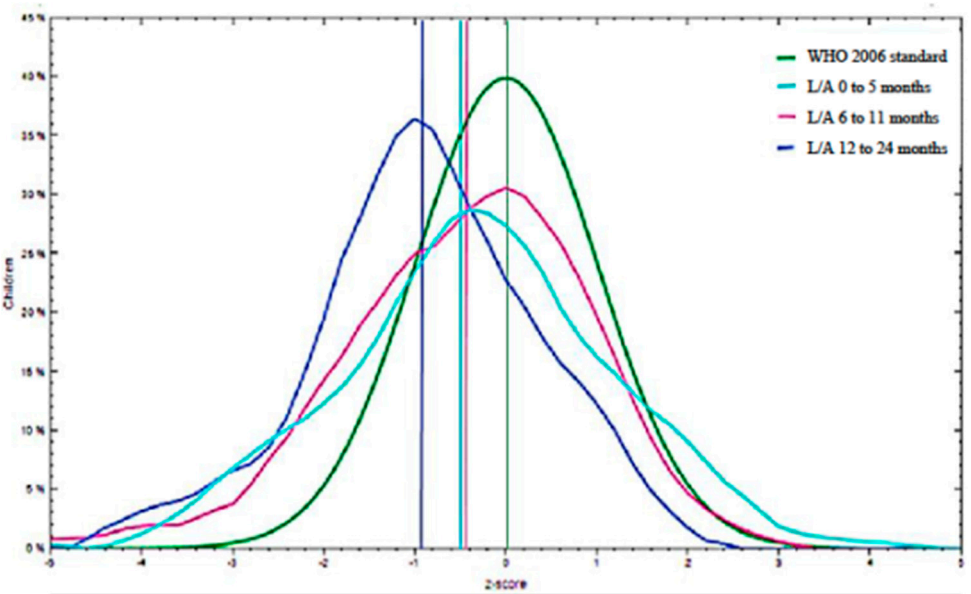
Figure 1: Distribution of L/A z-scores by sex* in 278 infants and young children that attended Klinik Saint Espri Health Center, Port au Prince, Haiti (August 2014).



Gender	n	zL/A	SD	IC 95%
Female	148	-0,44	1,33	(-0,655 -0,226)
Male	130	-0,79	1,32	(-1,020 -0,562)

Footnote: The green line indicates the WHO 2006 standard; the yellow line represents males, and the red line females. *ANOVA, p = 0.029.

Figure 2: Distribution of L/A z-scores by gender* in 278 infants and young children that attended the Klinik Saint Espri Health Center, Port au Prince, Haiti (August 2014)



Age (m)	n	zL/A	SD	IC 95%
0 a 5,9	116	-0,421	1,47	(-0,672. -0,17)
6 a 11,9	88	-0,49	1,34	(-0,782. -0,199)
12 a 24	74	-0,90	1,32	(-1,211. -0,591)

Footnote: The green line indicates the WHO 2006 standard; the light blue line represents the range of ages between 0 and 6 months, the lilac color between 6 and 11 months and blue color between 12 and 24 months (*ANOVA, p = 0.038).

3.2 Malnutrition by sex and age:

We found a non-significant trend of lower zW/A in male compared to female infants: -1.01 ± 1.44 versus -0.716 ± 1.29 respectively (Student's t-test, p= 0.07). Regarding age, we found a non-significant trend of lower zW/A in older infants: Between 0 and 5 months: -0.69 ± 1.46, between 6 and 11 months: -0.85 ± 1.32 and between 12 and 24 months: -1.1 ± 1.25 (ANOVA, p = 0.13). Male infants had lower zL/A compared to females (Figure 1), as well as lower zL/A in older infants (Figure 2). We observed that male infants also had a non-significant lower zW/L compared to females: -0.73 ± 1.38 versus -0.61 ± 1.15 (Student's t-test, p = 0.42). According to age, there was a tendency of higher zW/L in younger infants: -0.55 ± 1.39 in (0 to 5), -0.70 ± 1.14 (6 to 11) and -1.80 ± 1.20 (12 to 24 months old) (ANOVA, p = 0.38).

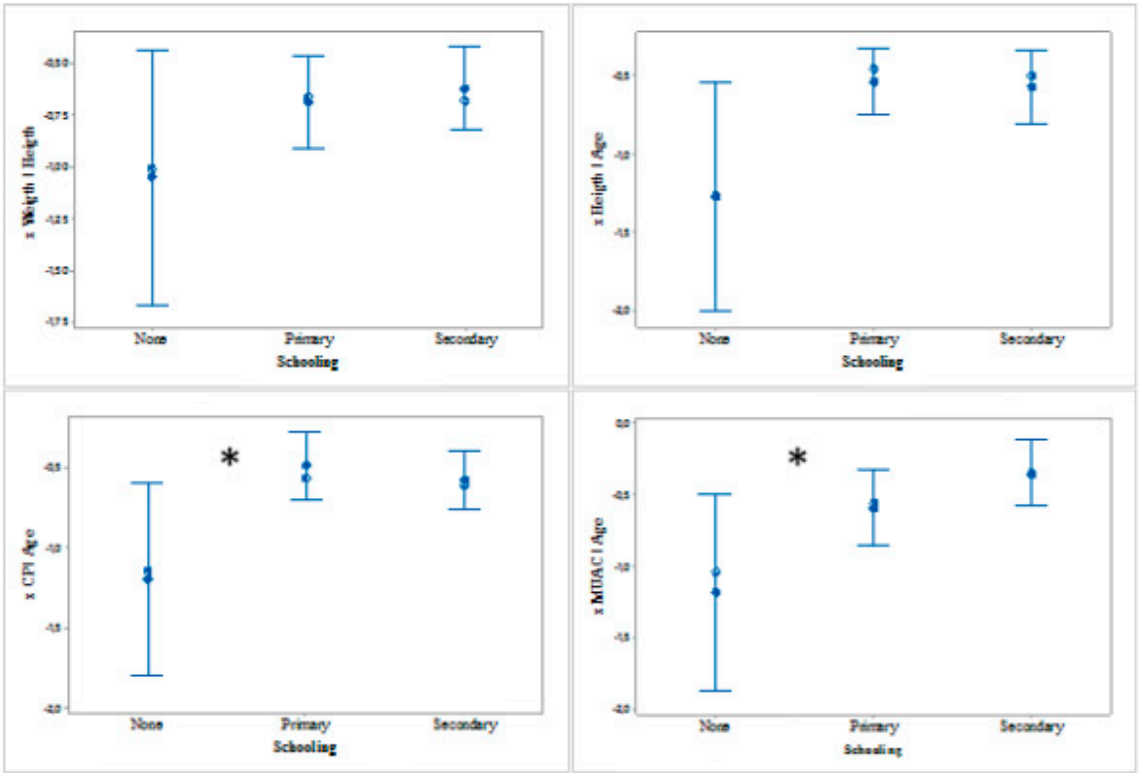
3.3 Malnutrition according to family characteristics:

zW/A, zW/L and zL/A were lower in children with mothers lacking formal education compared those with mothers having primary or secondary education (Figure 3). Also, the first ones had lower zBC/A than those born to mothers with education: -1.18 ± 1.08 versus -0.59 ± 1.12 and -0.35 ± 1.06 respectively (ANOVA, p = 0.036). They also had smaller zHC/A: -1.20 ± 1.2 vs. -0.49 ± 1.13 and -0.57 ± 1.11, respectively (ANOVA, p = 0.048).

Children from older mothers had lower zW/L: -0.31 ± 1.38 (mothers < 20), -0.55 ± 1.20 (mothers 20 to 29), and -0.89 ± 1.11 (mothers ≥ 30 years old), ANOVA, p = 0.015. There was an inverse correlation between maternal age and zW/L (adjusted R2: 1.9, p = 0.013).

As for the number of children per family, we observed lower anthropometric z-scores in families with more children. For zW/A: -0.62 ± 1.19 in one-child families, -0.94 ± 1.30 in families with 2 or 3 children and -1.14 ± 1.50 in those with 4 or more children (ANOVA, p= 0.04). In zBC/A the means were respectively: -0.40 ± 0.96, -0.42 ± 1.09 and -0.90 ± 1.29 (ANOVA, p = 0.05). We did not find differences according to place of living or paternal employment.

Figure 3: Z-score of anthropometric indexes according to maternal education, in 278 infants attending to Klinik Saint Espri Health Center, Port au Prince, Haiti (August 2014)



Footnote: 95% Confidence Interval. Means (black circles) and median (open circles).

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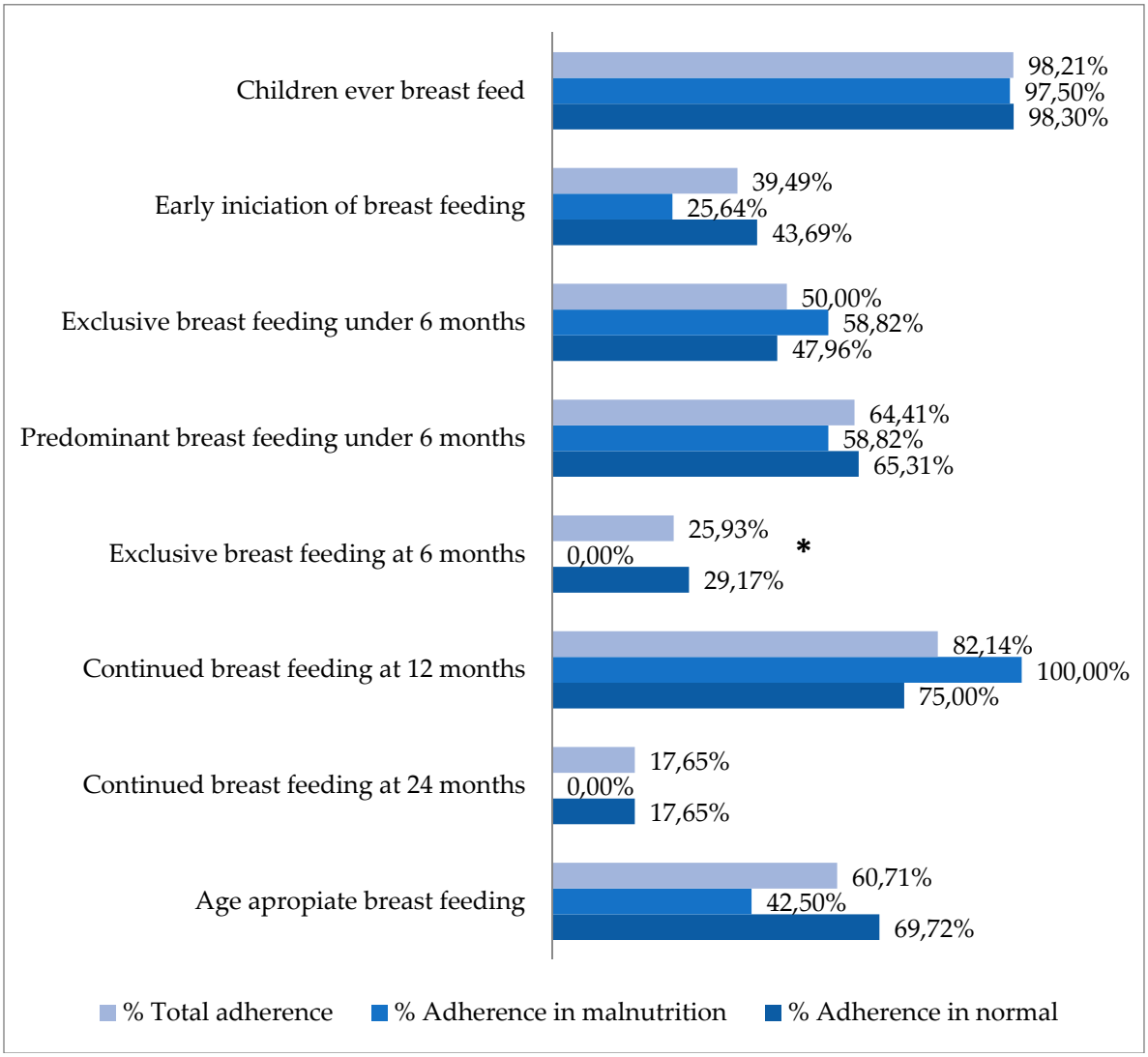
*p = 0.04 and 0.05 for BC/A and HC/A, respectively.

3.4 Feeding Practices:

The number of cases to calculate each indicator of feeding practices were variate, given the different size of groups by age. Overall adherence was between 97.9% (Children ever breastfed) and 3.1% (Consumption of iron supplements). The adherence for complementary feeding indicators was lower than those for breastfeeding (Fig 4,5). The frequency for meeting breastfeeding and complementary feeding practices were lower in malnourished children, compared with normal ones. Table 2 shows the association between adherence indicators and malnutrition.

Figure 4: Indicators of breastfeeding practices recommended by WHO in 278 infants that attended the Klinik Saint Espri Health Center, Port au Prince, Haiti (August 2014): Percentage of adherence in the total group, in those with wasting and in the normal ones.



Footnote: Wasting is defined as W/L < -2 DS according to WHO 2006 standard

* p < 0,05 test Chi2

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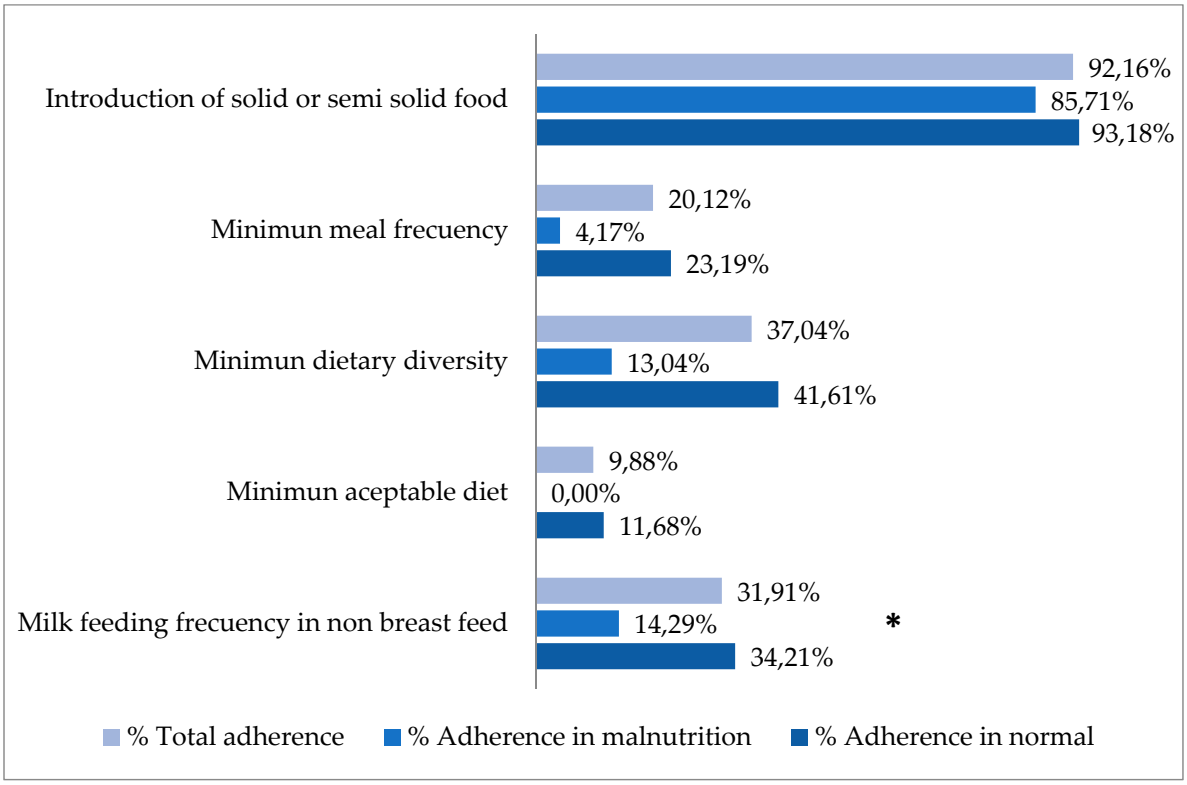
Figure 5: Indicators of adherence to complementary feeding practices (WHO 2008): in the total group, in those with wasting and in the normal ones.



Footnote: Wasting is defined as W/L < -2 DS according to WHO 2006 standard
* p < 0,05 test Chi2

Table 2: Association between breastfeeding or complementary feeding indicators (WHO, 2010) and the nutritional status in 278 infants and young children that attended Klinik Saint Espri Health Center, Port au Prince, Haiti (August 2014).

Indicator	**Nutritional status[#] (p)**		
	W/L	**W/A**	**L/A**
1. Children ever breastfed	0.92	0.59	0.13
2. Early initiation of breastfeeding	0.21	0.002*	0.04*
3. Exclusive breastfeeding under 6 months	0.09	0.32	0.59
4. Predominant breastfeeding under 6 months	0.97	0.000*	0.02*
5. Exclusive breastfeeding up to 6 months	0.03*	0.003*	0.54
6. Continued breastfeeding at 12 months	0.73	0.82	1.00
7. Age appropriate breastfeeding	0.03*	0.20	0.20

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8. Milk feeding frequency for non-breastfeed children	0.02*	0.06	0.23
9. Continued breastfeeding at 24 months	0.16	0.54	nv
10. Introduction of complementary foods	0.83	0.97	0.34
11. Meal frequency	0.75	0.70	0.90
12. Dietary diversity	0.10	0.11	0.90
13. Minimum acceptable diet	0.21	0.049*	0.35
14. Consumption of iron rich foods	nv	nv	nv

Nutritional status was analyzed as a categorical variable, with two ranks for each anthropometric index, for W/A and W/L: malnutrition vs. normal, and for L/A: stunting vs. normal. Cutoffs according to z-scores were: < -2 for abnormal and -2 to +2 for normal (WHO 2006 reference).

* Chi2 test for comparisons, with significance $p < 0.05$.

4. Discussion

The present study shows a high prevalence of malnutrition in Haitian infants and young children attending to an Ambulatory Health Center close to Port Au Prince, related to some children and mother´s characteristics. The association between malnutrition and adherence to WHO Feeding Recommended Practices varied, with a protective effect of breastfeeding. This is the first study exploring this association in Haitian pediatric population.

The sample of 278 children studied during one-month period was approximately 80% of this age monthly consultations in Klinik Saint Espri, mostly from the nearest commune Croix de Bouquetes [20]. Even the assessment during a short period of time can under or overestimate malnutrition because of seasonal food access variation, this sample belonged to an urban setting, with less impact of this aspect.

The prevalence of underweight (18.35%) and wasting (13.67%) were higher than a 2012 national survey [16]: 11.6% and 5.2%, respectively, but stunting was lower: 13.31 vs. 21.90% This tendency could be explained because we included only young children [1-3]. Previous reports in Haitian children founded 18.5% underweight, 10.3% wasting and 29.7% of stunting [13,16,21]. Results were similar to ours except for a higher stunting, probably because it was done in a different historic period, used OMS 2006 standard [22] and included older children; stunting is usually a consequence of early and/or longer malnutrition [3]. It is also important to consider that children with acute malnutrition are prone to attend to health services, because they are ill more often or join the Malnutrition Program. This aspect is relevant for planning screening and intervention strategies.

The higher prevalence of wasting in males differs from other international [2] and Latin American reports [23], but is consistent with other from Haiti [24]. Cultural practices that might explain this trend include a higher milk-formula feeding and an earlier introduction to solid foods in male. In addition, higher nutritional impairment in older children is expected [23]. Higher maternal age and larger number of children per family were associated with malnutrition possibly due to progressive poverty in larger families. This risk factor is possibly modifiable by early-life educative interventions and support [25, 26]. Maternal education influences the ability to provide adequate food, stimulation and a cleaner environment for the child [27]. In the present study, few mothers reported no access to education, a probable underestimation because 15.3% were illiterate and their children had smaller head circumference, indicator of poorer future cognitive function [3, 17].

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Indicators of adherence to feeding practices in the present study were like a WHO 2005-2006 study [13], but we found a lower adherence for continued breastfeeding at 2 years, age appropriate breastfeeding, minimum meal frequency and minimum acceptable diet. On the contrary, we observed a higher adherence to exclusive breastfeeding under 6 months, predominant breastfeeding under 6 months and minimum acceptable diet. A greater awareness of the importance of breastfeeding up to 6 months due to an implementation of a strong follow-up and educative program of mothers has had a positive impact. However, a lack of promotion of continued breastfeeding could have increased the use of breastfeeding substitutes, as shown by the low indicators of breastfeeding in older than 12 months and in age appropriate breastfeeding.

We found a lower wasting prevalence in the children that met the recommendations, especially for some breastfeeding practices. Although some trends were not statistically significant for all the indicators in complementary food, it is relevant to consider that the improvement of the diet with currently available local foods could have a protective effect: cultural aspects need to be recognized [28]. However, WHO recommendations refer only to food frequency or food groups, but not to portions; therefore, real intakes can vary according to different contexts, customs and food availability.

The size of the sample in the present study is lower than other studies in Haiti, but large in relation to the center's consulting population. We carried out our own survey, considering studies from other developing countries, selecting items that could better describe this population and particularly could contribute to guide future interventions. Center´s staff participated and assessed the survey, so the local nature of the study is strong, but can have a projection to similar settings. An important difficulty for health centers in developing countries, is to plan their actions beyond everyday contingency and global recommendations, in a context of limited resources [29]. In the present study, we implemented a simple methodology with low technological and technical support requirements, which allowed us to obtain relevant data from the target population [30].

5. Conclusions

In conclusion, we found a significant prevalence of child malnutrition, with a greater impact on males and older infants. Illiteracy and older maternal age, as well as larger number of children per family, were associated with higher rates of malnutrition. We found a low adherence to WHO recommended feeding practices, associated to malnutrition and a protective effect of good breastfeeding practices.

According to evidence-based practices, currently recommended by the WHO [25, 26, 31 – 33] our results indicate that the principal recommendations to improve nutritional status in this population are an early initiation of breastfeeding, exclusive breastfeeding under 6 months and continued breastfeeding to 2 years, starting complementary feeding at 6 months and no later. We also recommend to strength the existing Malnutrition Program, considering the groups of children at higher risk of malnutrition identified in this study. We aspire that our study will contribute to increase awareness in the target population of Klinik Saint Espri and other health centers, guiding interventions to improve child nutrition, using the strengths and resources available in the health center and the community.

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Author Contributions: BI and SB (Questions and design). BI, MG, DR and SG (Field development and instrument adjustment). BI, SB and EB (Data analysis). BI and SB (Article writing), SB and RU (Article revision).

Conflicts of Interest: "The authors declare no conflict of interest."

Appendix A

Survey used in the study, in Haitian Créole language:

1. Identification and general characteristics of the patient
2. Brief social evaluation
3. Nutritional information
    - 3.1. 24-hour Dietary Recall
    - 3.2. Use of nutritional supplements
    - 3.3. Additional breastfeeding questions
4. Anthropometry

Additional page: calculation of individual indicators of feeding practices (OMS 2003)

Rechèch Pwojè a: Pratik alimantasyon ak malnitrisyon timoun. | nimewo ankèt |

1. Idantifikasyon timoun				
1.1 Dat timoun nan fet	Mwa	Ane	Laj nan mwa	Konnen byen dat nesans timoun nan ? Wi ☐ Non ☐
1.2 Seks	Fi ☐		Garzon ☐	

2. Enfòmasyon sosyal			
2.1 Edikasyon nan manman Kisa dènye klas yo nan lekòl ou fin ranpli te ye?	Pa janm ale lekòl	Educación primaria	Educación secundaria
2.2 Kantite timoun nan manman an Konbyen pitit ou genyen?	1 pitit	2 ou 3 pitit yo	4 ou plis pitit yo
2.3 Salè paran Ki sa paran yo fè pou jwen laj an pou viv?	Anplwaye	travay detanzantan	Pap travay oswa mandyan

3. Alimantasyon

3.1 Manje rapèl manje dènye 24 èdtan pase

Mete tout manje ak bwason pran ti pitit la, ki gen ladan bay tete; ekri kantite yo ki ak apeprè tan.
Kantite dapre gid-la, ki koresponn a sa timoun la aktyèlman manje l'. Sonje tout sa ki timoun nan manje, yo bwè jou a anvan:
Nan maten an (manje maten): ki manje ou te bay li? Yon bagay yo bwè? Epitou tete?
Ant dejene ak manje midi Ki sa li manje?
Yo nan manje midi: Eske li ba ou nenpòt ki manje? Yon bagay yo bwè? Bay tete?
Ant manje midi, epi apremidi Eske li te pran nenpòt lòt bagay? Yon bagay yo bwè?
Apremidi: Eske li ba ou nenpòt ki manje? Yon bagay yo bwè? Bay tete?
Revize kisa manje, yo pran ti pitit la pandan jounen an. Èske gen nenpòt manje oswa bwason ke ou ta ka gen tan bliye mansyone?
* Si pitit ou a pran tete presize konbyen fwa nan yon jounen

Manje	Lè	Kalite manje	Kantite

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3.2 Manje siplemàn nitrisyonèl (Fwa pa semèn) Pandan semèn ki sot pase, konbyen fwa pitit ou a te bwe --?	Miltivitamin Nan konprime oswa siwo	Fè	Siplemàn nitrisyonèl ki sanble manba Kòm mamba oswa plumpy nwa	Siplemàn manje tankou fòtifye sereyal Kòm baby blend			
3.3 Alètman	Laj kòmanse tibebe tete Ki laj timoun bwe tete la pou premye fwa a?			Lè viv		Pa janm tete	
	Dire alètman eksklizif Jiska ki laj timoun nan te manje sèlman tete manman an? Vle di, li pran sèl tete epi pa gen okenn lòt kalite manje oswa bwason			Jou viv	Mwa	Alètman kounyea	
	Laj li te kòmanse manje solid Ki laj timoun nan manje manje a pou premye fwa a? Vle di, manje labouyl oswa kraze ak kiyè			Jou viv	Mwa	Alètman	
	Laj li fin alètman A ki laj timoun nan kanpe pran tete manman an?			Jou viv	Mwa	Alètman	

4. Antropometri		Nitrisyon dyagnostik	
4.1 Pwa Peze timoun lan toutouni, zewo balans, kilos ak gram mezire		Pwa / Laj	
4.2 Wotè Mezire timoun lan kouche sou pedomètr, an santimèt ak milimèt		Wotè/ Laj	
4.3 Tèt perimèt Sikonferans mezi soti nan oksiput nan silyèr rebò		Tèt perimèt/ Laj	
4.4 Bwa perimèt Sikonferans mezire nan pwen milye a nan bra ki genyen ant koud bra a ak akromyal. Bra a pandye nan repo.		Dyagnostik dakod bwa perimèt	
		Pwa / Wotè	

353

Kalkile endikatè (pa fe kesyon mak apre fini)

1. Tete			
1.1 Timoun 0-23 mwa bay tete te kòmanse èdtan nan 1st nan lavi Konsène tout timoun ki gen laj 0 a 23 mwa	Wi	Non	
1.2 Timoun 0 a 5 mwa sèlman manje bay tete Konsène sèlman nan timoun ki poko gen 6 mwa	Wi	Non	pa aplikab
1.3 Timoun ant 4 ak 5 mwa sèlman manje bay tete Konsène sèlman timoun ki gen 4 a 5 mwa	Wi	Non	pa aplikab
1.4 Timoun ant 12 ak 15 mwa li te pran yè bay tete Konsène sèlman timoun ki gen laj 12 a 15 mwa	Wi	Non	pa aplikab

2. Manje siplemantè ki			
2.1 Timoun ant 6 ak 8 ki te resevwa manje solid jou a anvan Konsène sèlman timoun ki gen laj 6 a 8 mwa	Wi	Non	Pa aplikab
2.2 Timoun 6 a 23 mwa resevwa manje omwens 4 gwoup diferan yè Konsène sèlman timoun ki gen laj 6 a 23 mwa	Wi	Non	Pa aplikab
2.3 Timoun ant 6 ak 8 mwa ki te manje 2 fwa oswa plis jou a anvan, ak tete Konsène sèlman nan timoun ant 6 ak 8 mwa tou pran tete manman an	Wi	Non	Pa aplikab
2.4 Timoun ant 9 ak 23 mwa ki te manje 3 fwa oswa plis yè, ak tet Konsène sèlman nan timoun ant 9 ak 23 mwa tou pran tete manman an	Wi	Non	Pa aplikab
2.5 Timoun ant 6 ak 23 mwa ki te manje 4 fwa oswa plis jou a anvan, li pa pran tete manman an Konsène sèlman nan timoun ant 9 ak 23 mwa ke pa pran tete manman an	Wi	Non	Pa aplikab
2.6 Timoun ant 6 ak 23 mwa ki te pran lèt 2 fwa oswa plis jou a piwo a epi yo pa pran tete manman an Konsène sèlman nan timoun ant 9 ak 23 mwa ke pa pran tete manman an	Wi	Non	Pa aplikab

3. Endikatè adisyonèl			
3.1 Timoun yon fwa te pran tete Konsène tout timoun ant 0 ak 23 mwa	Wi	Non	Non vle di li pajam tete
3.2 Timoun ant 20 ak 23 mwa li te bwe tetè yè Konsène sèlman timoun ant 20 ak 23 mwa	Wi	Non	Pa aplikab

354

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Appendix B

Example of common plates and glasses obtained from local businesses and models of common foods with painted plastic foam used for assessing portion size in 24-hour Dietary Recall.

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