Deuxième article : More time or more money to improve nutrition in Benin Republic?

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More time or more money to improve nutrition in Benin Republic?

M. C. D. N. VODOUHE[4] and L. FAKAMBI[5]

Abstract

Children malnutrition eradication in developing countries is a real challenge, especially among vulnerable population. There are so many effort towards women (who are the main care providers) socio-economic situation in order to improve their children nutrition. This article aims to identify the impact of mothers' activities on child nutrition and care. Interviews were used to collect data from mothers of children less than 5 years old. Pearson correlation test and regression models were performed to highlight relation and to identify the main factors that affect child nutrition and care. The nutritional statuses of children show a high prevalence of underweight (38.46%), emaciation (25.17%) and stunting (23.77%). Statistic results show that a child whose mother has food processing as main activity has 2,322 more times to not suffer from emaciation malnutrition compared to a child whose mother has trade as main activity. A child whose mother has high revenue has 1.463 more times to not be suffering from stunting malnutrition compared to a child whose mother has lower revenue. A child whose father has fishing as main activity has 8,4 more chance to not be suffering from stunting malnutrition compared to a child whose father has another activity as main activity. A child whose father is present in the household has 8.11 more chance to not suffer from stunting malnutrition compared to a child whose father is absent. A child from mother who has food processing as main activity is 2,464 more times preserved from fever compared to a child from mother whose main activity is trade. Moreover child position, child feeding with porridge, child nursing are correlated with mother activity. This situation is justified by the fact that mother need money to improve child nutrition and health but they are also confronted to the fact that those activity that provide significant money are sometime time consuming and not permit to take care of children in term of feeding practices, hygiene control etc. Therefore it is important that intervention towards women take in consideration those factors (money and time) but also the family in the whole.

Key words: Child malnutrition, Laguna area, Mother activity, Child care, Benin

Plus d'argent ou plus de temps pour améliorer la nutrition au Bénin ?

Résumé

L'éradication de la malnutrition chez les enfants dans les pays en voie de développement est un réel défi, spécialement au sein des populations vulnérables. De nombreuses initiatives ont été entreprises à l'endroit des femmes (qui sont les principaux pourvoyeurs de soin) pour l'amélioration de leur situation socio-économique et de l'alimentation de leurs enfants. Le présent article vise à apprécier l'impact des activités des mères sur la nutrition et les soins accordés aux enfants. La collecte des données auprès des mères d'enfants de moins de cinq ans, a été faite par interview. Le test de corrélation de Pearson et les modèles de régression ont été utilisés pour mettre en exergue les relations entre les variables et identifier les facteurs clés qui affectaient la nutrition et les soins aux enfants. L'évaluation de l'état nutritionnel des enfants a montré une prévalence élevée du sous-poids (38,46%), de l'émaciation (25,17%), et du retard de croissance (23,77%). Les résultats statistiques ont montré qu'un enfant dont la mère avait pour principale activité le commerce avait 2,322 fois plus de risque de souffrir d'émaciation qu'un enfant dont la mère avait pour principale activité la transformation des aliments. Un enfant dont la mère avait un revenu bas présentait 1,463 fois plus de risque de souffrir de malnutrition chronique qu'un enfant dont la mère avait un revenu élevé. Un enfant dont le père était absent avait 8,11 fois plus de risque de souffrir de malnutrition chronique qu'un enfant dont le père était présent. Un enfant dont la mère avait pour principale activité le commerce avait 2,464 fois de risque de souffrir de fièvre qu'un enfant dont la mère avait pour principale activité la transformation alimentaire. De plus la position de l'enfant, son alimentation à la bouillie, l'allaitement au sein ont été corrélés avec l'activité de la mère. Cette situation est justifiée par le fait que la mère a besoin d'argent pour améliorer la situation nutritionnelle de son enfant et de sa santé. Toutefois, les mères sont confrontées au fait que ces activités consomment aussi parfois beaucoup de temps et ne permettent pas la prise en charge adéquate de l'enfant par rapport aux pratiques d'alimentation et d'hygiène.

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Ainsi, il est important que les interventions allant à l'endroit des femmes prennent en considération les facteurs argent et temps, mais aussi la famille en entier.

Mots clés : Malnutrition infantile, région lagunaire, activité de la mère, soins aux enfants, Bénin.

INTRODUCTION

Malnutrition is one of the most devastating scourges in humanity. Today, the situation hasn't change so much in developing countries where the prevalence of malnutrition among children less than 5 years old is very disturbing. De Onis (2000) explained that children are the most vulnerable person and malnutrition, especially stunting affects 32.5% of children in developing countries. The same author reported that more than 26 percent of malnourished children in the world live in Africa. High prevalence of malnutrition was reported among the populations in some regions of Benin that is one of the countries concerned in sub-Sahara. This is the case of populations living close to water who have particular eco-system and socio-economic characteristics. Based on the national health demographic statistics, EDBS (2013) registered 30% of children from 6 to 59 months suffering from chronic malnutrition.

Since some decades, international institutions with the government have consent so much effort to reduce the incidence of malnutrition in Benin. However the situation doesn't change as much. Every year, UNICEF, WHO, FAO, ACDI etc. invest in food and nutritional programs that aim to improve mother knowledge in nutrition; considered as one of the most important cause of malnutrition. Unfortunately, even though those programs intervention have an important positive impact on mothers' knowledge regarding child nutrition, in the long term they attitudes and practices don't really change enough to impact children health. Most of the times mothers complain about the lack of financial resources and time to prepare special children meals demonstrated during those programs. At the same time, studies carried out by Banque mondiale (1999) have confirmed that the low levels of households revenues is one of the fundamentals causes of malnutrition in Africa and particularly in sub-Saharan Africa. Others studies reported by FAO (2002) have showed that mother revenue have more chance to be spent than father revenue for fundamentals needs such as foods. FAO (1992) concluded that the improvement of the nutritional, sanitary, educational and economic status of mothers could have positive impact on the well-being of the members of the households and on the national development. To response to that assumption, solutions decided by most of institutions, particularly the project named "Projet d'Interventions Locales pour la Sécurité Alimentaire » (PILSA) financed in the past (in 1990) by World Bank, attributed a particular attention to the improvement of women revenue through access to revenue generative activities. Unfortunately, as mentioned by USAID report (1988), those programs that aimed to improve the financial situation of women tended to increase the labour and charges of mothers without really improve the revenue. In some regions, Banque Mondiale (1988) reported that the negative impact was the young girls retrieved from school due the importance of mothers' works and the incidence of early deliveries and spontaneous abortions. Despite this, nutritional programs continue to focus only on mothers' knowledge or instead promote the development of multiple activities generative of revenue for women as one way to improve their socio-economical situation and therefore children nutrition, with less regard to the real societal and health impact. Therefore there is a need of evidence of the potential impact of women activities on children nutrition. In the present study, we explore social factors that could be determinant in children nutrition, with a particular accent on women activities revenue and time consuming. The question is to know if mothers need more time or more money to improve nutrition. The answer to this question could help to guide nutritional interventions from another dimension.

METHODOLOGY

Description of the study area

The study was carried out in the "Atlantic" district, in southern Bénin, precisely in Ouidah. Ouidah like other humid area in Benin is in an agro-ecological area difficult to access and therefore at risk of food insecurity. Ouidah is located in the humid area and limited from the south side by the Atlantic Ocean. Five villages named Houakpè-Daho, Toligbé, Azizakouè, Mèko and Aïdo were retained for investigation. The study focused on the most popular Women Association called "Association des Femmes Exploitantes de la Lagune" (AFEL) created since 1999 and having representatives in all the five villages. Fishing was the main activity in the area practiced by almost all households. Men were the most involved in this activity that remains traditional. Nowadays, they move to other countries like Congo and Ivory Coast where the activity was more productive. Therefore many women become households' chief with multiples responsibilities and had to be involved in many activities at the same time. Those activities were highly diversified according to the seasons and opportunities offered. A

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woman had in average 6 activities to carry out. However, the most important women activities were salt production, fish farming, gardening, oil processing, animal husbandry, trade, basketry.

Data collection

Data were collected through an exploratory phase for a holistic knowledge of the area and refinement of questionnaires. During the first step, we gather information from literature and a two week presence on the field help to refine the research and specifically the questionnaires. The second step has consisted in anthropometric data measurement (weight, height and age) on the children and their mothers and the administration of questionnaire to mothers. The questionnaire addressed children feeding practices, children care, socio-economic and demographic characteristics of the household and women activities.

Sampling

Children less than 5 years old and their mothers were included in the present study. Mothers were involved either in agro-processing activities or in trade. The questionnaires and anthropometrics measurements concern the children and their mothers. The sample size was determined based on Snedecor and Cochran (year) mean groups' estimation. The formula is as follow:

$$N=Z^2_{\alpha/2}(\sigma^2/L^2)$$

where: N is the size of the sample; Z is the distribution of the dependant variable; α is the type I error risk with IC (Confidence Interval) equal 95%; σ is the coefficient of variation and is estimated at 30%; L is the level of precision that is 10%.

Higher variability is attributed to consumption survey. According to a study realized by Dossa *et al.* (2001) on children less than 5 years old, the coefficient of variation is 30%. For that variable, the expected precision is 90%. Therefore L=10%. For anthropometrics data, the level of precision expected is superior to 95%. In the present study, 97% was considered and L=3%. The variables dispersion was 15%. The minimum sample size calculated was 100. For practical reasons, 103 mothers and 141 children were retained for the study.

Data analysis

Weight (W) and height (H) were combined with age (A) to determine indicators of nutritional status among children: W/A for underweight, H/A for chronic malnutrition and W/H for emaciation. Comparison was made based on OMS (1995) recommendations. Severe malnutrition was appreciated at -3SD limit and moderate malnutrition at –2SD limit. Epi-Info software was used for calculations. The appreciation of the nutritional status of adults (women) passed by the determination of the Body Weight Index (BMI) or Quetelet Index. The formula is as follow: $BMI = (W).(H^{-2})$. The classification is as followed:

- BMI ≤ 18.5: Under nourished
- 18.5 < BMI ≤ 25: Well nourished
- BMI > 25: Obese

SPSS 9.0 software was used for analysis. Concerning data on children care, the test of correlation of Pearson was used to appreciate the intensity of the relation mother-child (children control) during different women activities. The same test was used to highlight the relation between the main activity of the mother and the sanitary and feeding care attributed by mothers to their children. Binomial logit model with one explicative variable was applied to observe the orientation of the correlation and to appreciate the risk based on odds ratios.

In order to highlight the activity that contributes the most to fever occurrence among children, a binomial logistic regression test was applied. The independent variable in this case was "mother main activity" and the dependent variable was "fever appearance". The independent variable took value "0" when the main activity was processing, and the value "1" when the main activity was trade. Regarding dependent variable, it took the value "0" when fever was absent and the value "1" when fever was present. We made the hypothesis that processors, due to the fact that there were generally more closed to their children, could better control hygiene around their children. Therefore, our expectation was a positive relationship between the two variables.

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Regarding socio-economic data, the first step consisted in the determination of women revenues. According to Dossou (1999), revenue is the amount of money derived from the productive activity of the enterprise and that the producer could own ship as worker. Therefore, there is a profit but also a normal remuneration as well as direction remuneration. The following formula is used for the determination of raw benefit: Raw benefit = Production – Variable costs.

In the present paper, revenue was considered as the raw benefit. Binomial Logit model was used to determine the main socio-economic factors that influence malnutrition. Kirere *et al*. (2004) has also used the Logit model to do an econometric analysis on the determinants of malnutrition. Two regressions models were realized in this case. The independence test of Chi Two was used before defining the variables that could be considered as explicative variables. Chronic malnutrition (Height/Age) and Emaciation (Weight/Height), the two malnutrition indicators were used as dependent variables.

Risk factors considered as explicative variables were: the nutritional status of the mother, socio-demographic characteristics of the mother, revenue of the mother, the main activity of the father, the main activity of the mother etc.; but all these factors were not introduced in the model. They were taken in account only when they were significantly independent from the dependent variables. The regression model was as follow: Y = f(X, e), with: Y= dependent variable; X= matrice of variables that could explain the variation of Y; e= Logistic error of the distribution; Y is the nutritional status of the child and X the matrice of explicative variables. The dependent variable was codified as follow: 0: normal nutritional status; 1: Poor nutritional status. $Ya = (e^{Xik\,\beta\,i\,k}).(1+ e^{ik\,\beta\,ik})^{-1}$, where: K is the indice of the study area. It is used in area where there is high variability; β_{ik} is the vector of the parameter i estimated in the study area (k). The estimation of the model was done using the maximum law of likelihood with STATA 3.1. software.

To appreciate the significance of the means at certain levels, T-Student test was used. $T = (M_1 – M_2).(^{\sigma}M_1 – M_2)^{-1}$, where: $^{\sigma}M_1 – M_2 = [\pi (1-\pi)(1/n_1+1/n_2)] – ½$; M_1 and M_2 are the means to compare; n_1 and n_2 the sizes of correspondent samples; $\pi = (n_1M + n_2M_2).(n_1 + n_2)^{-1}$.

RESULTS

Attitudes and practices of women regarding children care

Table 1 shows the percentage of mothers who respect or not recommendations.

Table 1. Attitudes and practices of women regarding children care.

Age of start of weaning			
Practices	Inferior or equal to 3 months	Superior to 3 months and inferior to 6 months	From 6 months
Rate (%)	73	18	9
Age of access to family meal			
Practices	Before 1 year	After 1 year	-
Rate (%)	67.77	35.23	-
Consumption of special meals			
Practices	Yes	No	
Rate (%)	23.87	76.13	
Age of end of weaning			
Practices	Before 2 years	After 2 years	
Rate (%)	27.94	72.06	
Vaccine situation			
Practices	Yes	No	
Rate (%)	59.57	40.43	
Fréquentation of health center			
Practices	Yes	No	
Rate (%)	38.71	61.29	

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The majority of mothers don't respect OMS recommendations and start weaning before 3 months. There is a socio-cultural background regarding the decision to start early or not child weaning. In fact, traditionally, the time when mother resume their activities and the time when weaning begins are the same. Primiparas resume activities generally at 5 months since they are less experienced and multiparous start earlier at 3 months. After a cultural ceremony called "child outside" where mothers are authorized to go to their activities, mothers start weaning to be freer in their movements. Traditionally, mothers who have not yet got back their menstruations (generally 3 months after delivery) are not authorized to go to their activities such as culinary activities. Therefore, most mothers use this period to start weaning.

Regarding access to family meal, most children access to it before being one year old; therefore mothers are freer to go to their activities and can easily leave children at home. The cooking of special food for children is not usual. Despite advices received by mothers during nutritional sensitization programs, they explain that they don't have time to cook to only one child. It is also a waste of money if all the family have to eat that special meal. The majority of mothers stop breastfeeding after 2 years old as recommended by OMS. Regarding vaccination, almost half of the children are vaccine but this is not sufficient considering the risks. Moreover, several mothers don't go to health centers as recommended.

Prevalence of proteino-energetic malnutrition and Health situation

The different forms of proteino-energetic malnutrition were measured among children of different ages (from 6months to 5years old children). The prevalence of chronic malnutrition was 23.77%; with higher prevalence among elder children. The prevalence of underweight was 38.46% with also higher prevalence among elder children. The prevalence of emaciation was 25.17 %; with higher prevalence among children of [6-12] and [12-24] age classes. It could be observed that a significant percentage of children suffer from infections (Table 2). The most prevalent affections were respiratory affections, followed respectively by fever and diarrhea.

Table 2. Health situation of children.

Prevalence of fever during the last two weeks		
Practices	Yes	No
Percentage	38.30	61.70
Prevalence of respiratory affections during the last two weeks		
Practices	Yes	No
Percentage	44.68	55.32
Prevalence of diarrhea		
Practices	Yes	No
Percentage	27.66	72.34

Description of women activities

The main activities carried out by interviewees are presented in Table 3 with the percentage of women involved in each activity.

Tableau 3. Percentage of women in different activities.

Activities	**Processing of salt**	**Processing of fishery products**	**Collect of crab and oyster**	**Other food processing**	**Gardening**	**Artisanal activities**	**Others**
Percentage of women	46	43	31	10	7	2	40

Salt processing was the main activity in the area of study followed by processing of fishery products and collection of crabs and oysters. However many women were involved in seasonal activities even though not so important with regards to the revenue provided, but at least the products were used directly for own consumption. For most of women traders, the activity started at 08 or 09 o'clock a.m. Those women came back to village around 14 or 17 o'clock. Those who sell their product far away on Djoda or Cotonou market stayed for 2 to 3 days out. Women involved in salt processing stayed

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generally on the production place for around 7 hours and came back at 18 o'clock. To collect crabs and oysters, women went early in the morning and came back at around 12 o'clock. During processing activities, mothers were often closed to their children (95%). In period of salt processing that was most important food processing activity in the localities, the entire family (mother, father, children, grand-mothers) spent the whole day on the production site that became their second house. Therefore, they could easily take care of their children and prepare porridge and control children feeding and hygiene. In contrast, during trade, that was another major activity, children were often separated to their mother. Only 15% of mothers surveyed had their children less than one year old closed during trade. In that situation, less care was allocated to the children by mothers, including nutritional and affective cares. Most of those mothers complained that when they carried their children to go to their trade activity children cried a lot. The children were exposed to diseases since they had to spend one or more days in canoe and therefore, exposed to bad weathers. For those who went to Cotonou, they had to spend till 3 days outside, and since they wade up early in the morning, they did not have time to prepare porridge to children before leaving. They preferred leave children to grand-parents or older sisters or brothers to take care of them. If not, they had to limit their activity.

Relation between the nature of the activity and children care

Correlation is established between the nature of the mother activities (Agro-food processing and Trade)and their children care. When time allocated to agro-products processing was superior to trade, the main activity of the mother was agro-food processing. Similarly, when the mother allocated more time to trade, the main activity was considered as trade. Regarding care variables, we considered: the position of the child (close, around, far from the mother); breastfeeding (adequate or not); feeding by mother (adequate or not), porridge (adequate or not), adult feeding (adequate or not). The results of the correlation test between the nature of mother main activity and the care allocated to the child are presented in Table 4. The analysis shows that the position of the child (near or far from the mother), child feeding, child feeding as porridge, nursing are significantly correlated at 5% with the main activity of the mother. In contrast, child feeding as solid food is not significantly correlated with mother main activity.

Tableau 4. Correlation between the nature of mothers activities and children care.

Nature of mother main activity and Care to child	Pearson Correlation
Position of the child	0,80*
Child breastfeeding	0,32*
Child feeding by mother	0,52*
Porrigde feeding	0,23*
Adult feeding	-000
* The correlation is significant at 0.05 (bilateral)	

Impact of AGR of women on children care

Age of weaning, age of access to family meal, use of special meal, age of end of weaning, vaccine status of the child, presence of fever, presence of respiratory infection, presence of diarrhea and frequentation of health centers were variables that have been considered to potentially been influenced by mothers' activities in the locality. Pearson test of correlation was applied to the variables to appreciate the relation between mother main activity and children care. The different variables were described in Tables 5, 6 and 7.

Tableau 5. Description of nutrition Variables.

Components	Appreciation criteria
Age of weaning	▪ After 3 months ▪ Before 3 months
Age of family meal access	▪ Before 1year ▪ After 1year
Utilisation de repas spéciaux	▪ Preparation of special meal ▪ No preparation of special meal
Age of end of weaning	▪ After 2 years ▪ Before 2 years

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Tableau 6. Description of health variables.

Components	Appreciation criteria
Respiratory infections	▪ No cough or rhum during the last two weeks ▪ Cough and rhum during the last two weeks
Diarrhea	▪ No diarrhea during the last two weeks ▪ Diarrhea during the last two weeks
Frequentation of health centers	▪ Frequentation of hospital ▪ No frequentation of hospital
Fever	▪ No fever during the last two weeks ▪ Fever during the last two weeks
Vaccinal status	▪ Satisfactory vaccinal status ▪ Non satisfactory vaccinal status

Tableau 7. Description of woman activity variables.

Components	Appreciation criteria
Mother main activity	Food Processing: When time allocated to processing > time allocated to trade Trading: When time allocated to processing < time allocated to trade

The results in Table 8 show that the only one variable significantly ($p<0.05$) correlated with the nature of mother activity was fever presence.

Table 8. Correlation between mother main activity and care practices on children.

Component	Correlation test	Vaccinal status	Age of			Use of special meals	Fever	Diarrhea	Respiratory infections	Frequentation of health centers
			end of weaning	weaning	access to family meal					
Mother main activity	Correlation of Pearson	-0,004	- 0,022	- 0,094	0,136	- 0,121	0,213	0,46	- 0,159	0,041
	Sig. (bilateral)	0,969	0,884	0,382	0,207	0,263	0,045	0,668	0,138	0,704

The binomial logistic regression test results Table 9 revealed that the mother main activity was an explicative variable of appearance of fever among children. A child from mother who had food processing as main activity was 2,464 more time preserved from fever appearance compared to a child from mother who had trade as main activity.

Table 9. Correlation between mother main activity and fever appearance.

		B	E.S.	Wald	Ddl	Significant	Exp(B)
Step 1	ACT_MAIN(1)	0,902	0,454	3,943	1	0,047	2,464
	Constant	1,041	0,336	9,620	1	0,002	2,833

Impact of women activities on the nutritional status of children

The focus was on children between 6 to 60 months. Socio-economic variables that could affect children nutritional status were considered. The different variables were as follow:

- Variables related to mother activities: Revenue generated by mother activity; Number of activities carried out by mother; Main activity of mother in regard to the time allocated; Mother behavior when outside from household;
- Other socio-économic variables related to mother situation or characteristics: Ethnic group; Religion; Age; Household size; Education level; Physiological situation; Absence/presence of the husband; Main activity of the husband; Contribution of the husband to food expenses in household;

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- Nutritional status of mother.

We first proceeded to the application of independence test between the different variables and children nutritional status indicators. The indicators considered were the emaciation (W/H) and stunting (H/A). Variables significantly linked to the children nutritional status were :

- Regarding stunting: Main activity of husband; Behaviour of mother in case of absence from household; Absence/Presence of husband in the household.
- Regarding emaciation: Revenue of mother main activity; Mother main activity; Physiological status of mother.

The different variables are presented in Table 10. The results of the regression models are presented in Table 11 and Table 12. Analysis of the results revealed that explicative factors of stunting were: main activity of the husband, presence or not of the husband in the household. Regarding emaciation, explicative factors were the revenue from mother activities and mother main activity.

Table 10. Description of variables considered in the model for determination of factors affecting child nutritional status.

Variables	Designations	Codes
Dependent variable (Emaciation/Stunting)	Child nutritional status	0: child with good nutritional status 1: Child with bad nutritional status
Independent variables	Husband activity *(ACTIV-hus)*	0: if the main activity of the husband is fishing 1: if the main activity of the husband is another than fishing
	Absence/Presence of husband in the household (ABS-HUS)	0: presence of husband 1: Absence of husband
	Behaviour of mother when moving to her activity (COMP-M)	0: mother moving with the child 1: mother not moving with the child
	Mother activity (ACTIV-M)	0: Food processing as main activity 1: Trade as main activity
	Mother revenue (REV-M)	

Table 11. Results of model estimation (1).

Logit estimates				
Dependant variable	**E11NUTRI**		**LR chi2(3) 17.91**	
Variables	Coef.	Std. Err.	P>|z|	Odds Ratio
C	-3,252	1,408	0,021	
COMP-M	-0,554	0,644	0,39	0,58
ACTIV-HUS	2,128	0,564	0,047	8,4
ABS-HUS	2,094	1,097	0,034	8,11
Log likelihood = -43.547	Prob > chi2	0.0005	Pseudo R2= 0.7423	

Table 12. Result of model estimation (2).

Logit estimates				
Variable dépendante	E12NUTRI		LR chi2(3) 12.11	
Variables	Coeff	Std. Err	Prob.	Odds Ratio
C	2,871	1,269	0,0237	
ACTIV-M	0,842	0,487	0,0333	2,322
REV-M	0,380	5,47E-06	0,042	1,463
ETA-M	-0,303	0,465	0,5148	
Log likelihood = -56.09	Prob > chi2 0.0070		Pseudo R2 = 0.6521	

Odds ratio calculations revealed that:

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- A child whose father had fishing as main activity had 8.4% more chance to not be suffering from stunting compared to a child whose father had another main activity.
- A child whose father was present in the household had 8.11 chance to not suffer from stunting compared to a child whose father was absent.
- A child whose mother had food processing as main activity had 2.322 more times to not suffer from emaciation compared to a child whose mother had trade as main activity.
- A child whose mother had high revenue had 1.463 more times to not be suffering from stunting compared to a child whose mother had lower revenue.

Whatever the case, the observation was that food processing activity affects positively the nutritional status of children by the flexibility of activity allowing women to be with their children and to take care of them.

DISCUSSION

This study revealed that the nature of mother activity influence the nutritional status and the care allocated to children. Mothers who have trade as main activity have more risk to have their children suffering from fever, the first alert of morbidity and precisely infection. This situation confirms the plaints of mothers regarding the fact that children are exposed when they have to accompany their mother during their trips, especially during trade. Moreover, during that activity, children benefit from less care since they are away from their mother and are under the responsibility of tierce persons who do not have necessarily skills to do it; like young brothers or sisters. From 1975 to 2005, the percent of women involved in labor force has considerably increased (54.9% to 76.9%) and the effect of the impact of mother work on children health is still unclear. The study has observed that children of working mothers are 200% more likely to get disease than stay-at-home mothers. Even though mothers' activities provide revenue that is used for children care, it can have at the same time negative impact by the lack of supervision (less time to do special meals for children) from mother regarding care.

Fisher father has positive effect on the nutritional status of their children because fFish and oyster were the most available protein resources in the area. It could be supposed that children in households where the father is fisher have better access to that nutrient improving their nutritional status. Therefore the total absence of father could affect chronic status. Moreover in a long term, the total absence of the fathers in the household makes mothers face financial difficulties and probably incapacity to face various charges. Fentaw *et al*. (2013) mentioned that when household is headed by mother, children are likely to be malnourished. Sarmento and da Silva (2000) explained that mothers living alone have more difficulties to take care of children and those one are at risk of malnutrition. Hossain and Anziano (2008) notified that fathers' involvement in children care is influenced by his work hours.

The influence of mother activity on nutritional status and particularly emaciation is justifiable by the fact that the nature of the activity could give to the mother more or less time to spend with children. It confirms the flexibility of processing activities compared to trade that doesn't allow mother to give full attention and care to children. Moreover the revenue of the activities could help them to fully contribute to financial charges in the household, especially children feeding and sanitary cares. Thompson *et al.* (1994) reported that money and time are the two most important resources that households provide to their children.

Parent *et al.* (2002) observed that the two main factors of risk of malnutrition among populations in proximity to water is the lack of hygiene and the mother activity. This observation justifies the relation observed between fever occurrence among children and mother activities. Saaka and Osman (2013) explained that household with socio-economic status is likely to have good diversified diet and better food that are known to impact children nutrition. Regarding the impact of mother education level on children nutrition, it was revealed to not be significant in this study. Others studies such as the one that Kalil *et al*. (2012) reported showed a positive effect of mother education on children care. College education mothers spend more time in children care compared to high school mothers. Morrill (2011) explained this difference by the fact that the work was done in regions where almost all the mothers have very low education level so almost in the same category. Moreover Hossain and Anziano (2008) reported that mothers spend more time in children care compared to fathers and time allocated is not related to socio-economic characteristics such as age, education, work hour and length of marriage.

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CONCLUSION

Mother's activity has an influence on the nutritional status of children, in particular on emaciation. Moreover, it can be concluded that mothers need more money but also time to improve children nutrition. In fact, even though persons in charge of care of children nourish children in the absence of the mother, there is no certitude regarding hygiene control and other care that children can benefit from if they are with their mothers. This aspect is important in that sense that the children nutrition and health are linked. There is a need to mention that father activity is also important and his presence in the household to share with mothers responsibilities regarding children.

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