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Association between Socio-Demographic Factors, Adequacy of Breastfeeding Practices and Complementary Food for Children below 24 Months in Fako, South West Region of Cameroon

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Abstract

Death and morbidity due to Protein Energy Malnutrition in infancy continue to scourge populations in developing countries, thus the aim of this study. A total of 123 children below 2 years of age were recruited in this descriptive cross-sectional study. Socio-demographic data and information on the different infant feeding habits were obtained by the use of semi-structured questionnaire. Nutritional status was assessed by using of anthropometric measurements. Data obtained was statistical analyzed using SPSS version 20.0. In terms of nutritional status, underweight was defined as a weight for age z-score less than 2 standard deviation SD below the mean, wasting as weight for

length z-score less than 2 SD below the mean and stunting as length for age less than -2 SD. Out of the total 123 participants in the study population, just 27.6% of them were exclusively breastfed. In the study population, 87% of the participants had a family income of less than 50,000 frs CFA per month. The significant predictors of wasting were exclusive breastfeeding (p=0.017), number of times the baby eats fruits (p=0.047) and number of times feeding bottle is cleaned (p=0.023). Underweight had as predictor type of complementary food given (p=0.009) with the predictor of stunting being number of children at home (p=0.036). Further analysis revealed that a total of 82.1% of the children in the study population were malnourished.

Hence, socio-demographic factor like family income, poor breastfeeding practices and inadequate complementary foods are associated and contribute to the poor nutritional status of children in Cameroon.

Introduction

Focusing on improving the nutritional wellbeing of children below 24 months old has the potential to reduce the severity of stunting, increase weight, and support cognitive function and possibly prevent the severe consequences such as mental retardation and emotional instability (WHO, 2016).

Nutrition is the term given to the study of the food being eaten, and how the body utilizes the nutrients in food [1]. These nutrients play an essential role in the body processes of digestion, breathing, growth and repair of body tissue, heart function and prevention of disease [2]. The nutritional requirement of an individual depends on measurable characteristics such as age, sex, height, weight, degree of activity and rate of growth (NPHP, 2001)]. The nutritional status is the state or condition of the body which result from the intake, absorption and utilization of nutrients and the influence of disease-related factors. It shows the degree to which the individual's physiological need for nutrients is being met by the food consumed (WHO, 2007).

Generally, the risk of malnutrition in the first 2 years of life has been directly linked with poor breastfeeding and complementary feeding practices of mothers together with high rates of infectious diseases [3]. In Cameroon, the prevalence of children under 5 years of age with weight deficit for their age was 19.3% in 2006 and the prevalence of children under 5 years of age with weight deficit for their height was 6% in Cameroon (UNICEF, 2009). According to the WHO, in 2011 over 101 million children under the age of 5 were underweight, 165 million were stunted, and approximately 52 million were wasted (WHO, 2012). Consequently, estimates of the prevalence of malnutrition among school-aged children suggest that these indicators do not improve much with age.

Weaning is the process where a baby transits from breast milk to other sources of nourishment. Breast milk is the first food for infants and should be fed alone for the first 6 months of life [4]. Exclusively, breast feeding for the first 6 months is the World Health Organization (WHO)'s recommended method of feeding full-term infants by healthy, well-nourished mothers (WHO, 2007). However, after 6 months, breast milk alone is not sufficient both in quantity and in quality to meet the nutritional requirements of the child.

Appropriate foods referred to as weaning or complementary foods need to be introduced, which starts as liquid foods and slowly progress to solid foods. This is the weaning process; the introduction of foods other than breast milk in to an infant's diet while slowly reducing breast feeding [1]. Weaning habits have a significant effect on the nutritional status of children [5].

The gap between nutritional requirement and amount obtained from breast milk increases with age. So, the additional nutrient is expected to be covered by complementary foods. For energy, it is 200, 300, and 550Kcal per day at 6-8, 9-11, and 12-23 months, respectively, with highest proportion from carbohydrates followed by proteins and very little from fat (FAO, 2006). It has also been reported that a million children die worldwide each year because they are not breast fed [6] and Many studies have identified that bad weaning habits can lead to malnutrition especially in children under the age of five.

Materials and Methods

Field Work Epidemiology

Study Area

This study was conducted in some municipalities in the South West region including Buea, Limbe, Mutengene, Tiko.

Study Design

This research involved carrying out a cross sectional study on the study population.

Ethical Issues

Ethical clearance was sort from the Institutional Review Board hosted by the Faculty of Health Sciences, University of Buea (2021/1258-12/UB/SG/IRB/FHS) following administrative clearance from the South West Regional Delegation of Public Health, authorizations from general secretariat of the hospitals and house heads in the study area. Informed consent/assent forms were given or read and explained to parents or care givers of the children at presentation. After all this, we proceeded to for questionnaires were administered on the field and complementary food samples collected.

Inclusion Criteria: children below 2 years of age, mothers attending vaccination clinics, healthy mothers with non-vulnerable children aged below 24 months and household breastfeeding mothers.

Exclusion Criteria: children above 2 years of age, pregnant women, neonates, prisoners, hospitalized patients, mentally ill persons.

Sample Size

The minimum sample size required for the study was calculated using formula;

$$n = Z^2_{\alpha/2}(1-a) \, P \, (1-P)/d^2$$

Where n is the minimum sample size required; **Z** is 1.96 which is the standard normal deviate; **a** is absolute precision at 5%; **p** is 9.25% which is the proportion of undernutrition prevalence in southwest [7] and **d** is 0.05(5%) the required margin of error. This gives a minimum sample size of 123 participants for the study.

Study Population

The target population of this study is 123 which include children with ages below 24 months old who was randomly selected as there were brought to the hospitals for vaccinations by their mothers.

Questionnaire Administration

The mothers of children were subjected to a questionnaire that include; relevant components focusing on identification of socio-demographic characteristics of the child's family including mother's origin, mother's age, parent's level of education and family income as well as the family size and residence. The second component had questions which addressed the mothers about child feeding pattern as well as breast feeding status and weaning habits of children between 0-24 months old. The children were also subjected to growth monitoring data collection using standard anthropometric measurements including; Age, weight, head circumference and upper hand circumference by using non-elastic measuring tape while the weight was taken using a spring balance.

Procedure

Data collection was done in following steps

- Interview of mothers: mothers who brought their children for vaccinations in the chosen hospitals in Buea, Tiko, Mutengene, Limbe were interviewed with the questionnaires. They were asked about their children (name, age, sex, date of birth, types of feeding habits, types of foods that the child is fed with other than breast milk, time weaning started and ended, number of times child is fed and quantity of food child is fed per day), their occupation and their husband's occupation, their age, level of studies, marital status, religion, number of children. All this information obtained from the mothers were filled in the questionnaires with respective serial numbers.

- The anthropometric measurements of the children were taken (height, head circumference, mid arm circumference, weight).

Statistical Analysis

Data collected was analysed using the IBM-Statistical Package for Social Sciences (IBM-SPSS) version 20. Continuous variables were summarized into means and standard deviations (SD) and categorical variables reported as frequencies and percentages were used to evaluate the descriptive statistics. The differences in

proportions were evaluated using Pearson's Chi-Square (χ2). Significant levels were measured at 95% confidence interval (CI) with significant differences set at <0.05. Association between socio-demographic data, breastfeeding practice and complementary feeding were done using SPSS software.

Results

Socio-Demographic Characteristics of the Study Population

The family's socio-demographic data of the study subject are listed in table 1. Table1a shows that more than half (57.7%) of the children were girls and less than half (42.3%) of them were boys with most of the children being aged 0-6 months (43.9%). Close to half (48.0%) of the fathers were aged >40 years and were not working (54.5%), and majority of them (36.6%) ended at primary school level. More than half (61.0%) of the mothers were aged 20-30 years, the majority not working (55.3%) and ended in primary school (38.2%). The family size of the children was mostly 5-6 (46.3%) people with income less than 50,00frs per month.

Table 1a: Socio-demographic (sex, age, fathers employment and education level) characteristics of the study population

Characteristics	N	%
Sex		
Male	52	42.3
Female	71	57.7
Age		
0-6 months	54	43.9
6-12 months	44	35.8
12-18 months	25	20.3
Father's age		
20-30yrs	18	14.6
31-39yrs	59	48.0
>40yrs	46	37.4
Father's employment status		
Employed	52	42.3
Unemployed	71	57.7
Father's education level		
Primary	45	36.6
Secondary	37	30.1
High school	32	26.0
University	9	7.3

Age of mother		
<20yrs	35	28.5
20-30yrs	75	61.0
31-39yrs	13	10.6

The complementary feeding practices of the children aged 0-23 months (Table 1b) shows that the majority of the children were inappropriate CF, almost half of them had untimely introduction to CF at less than 3 months of age (63.4%) and also consumed more of homemade foods like pap (61.0%). The result of the study also shows that more than half of the children did not receive iron or multivitamin syrup supplementation and fortified food. Majority of the children do not consume meat at all (39.8%), do not consume fish (43.1%), never consumed vegetables (39.0) and never consumed fruits (43.1%). In terms of the timeliness of introduction to CF, this study found less than half (9.8%) of the children received CF timely, while the rest was introduced earlier (63% at < 3 months, 26.8% at 3-6 months.

Table 1b: *Socio-demographic (Mothers employment, education level and time of complementary foods introduction) characteristics of the study population*

Characteristics	N	%
Mother's employment type		
Self employed	33	26.8
Government	14	11.4
Private	8	6.5
None	67	54.5
Mother's employment status		
Employed	55	44.7
Unemployed	68	55.3
Mother's education level		
Primary	47	38.2
Secondary	45	36.6
High school	25	20.3
Family size		
2-4	38	30.9
5-6	57	46.3
7 and above	28	33.8
Time complementary food was introduced		
<3months	78	63.4
3-6month	33	26.8
>6months	12	9.8

Table 1c give the Socio-demographic characteristics of the children aged 0-23 months in term of sources of foods, type of complementary foods and meal frequencies. It shows that the majority of the children were inappropriately fed, almost half of them had untimely introduction to CF at less than 3 months of age (63.4%) and also consumed more of homemade foods like pap (61.0%). The result of the study also shows that more than half of the children did not receive iron or multivitamin syrup supplementation and fortified food. Majority of the children do not consume meat at all (39.8%), do not consume fish (43.1%), never consumed vegetables (39.0) and never consumed fruits (43.1%). In terms of the timeliness of introduction to CF, this study found less than half (9.8%) of the children received CF timely, while the rest was introduced earlier (63% at < 3 months, 26.8% at 3-6 months).

Table 1c: *Socio-demographic characteristics (sources, type of complementary foods and meal frequencies) of the study population*

Characteristics	N	%
Type of complementary food		
Homemade food	75	61.0
Locally produced food	29	23.6
Standard foods	5	4.1
Homemade meal for everyone	14	11.4
Number of times baby eats meat		
Once	44	35.8
Twice	27	22.0
Thrice	3	2.4
Never	49	39.8
Number of times child eats fish		
Once	38	30.9
Twice	32	26.0
Never	53	43.1
Number of times baby eats vegetables		
Once	39	31.7
Twice	36	29.3
Never	48	39.0
Number of times baby eats fruit		
Once	40	32.5
Twice	30	24.4
Never	53	43.1
Does baby take any multivitamin		
Yes	37	30.1
No	86	69.9

Standard CF preferred		
Phosphatine	51	41.5
Cerelac	19	15.4
Blesolac	30	24.4
Custard	23	18.7

Nutritional Status of 0-24 Months Old Children

The study showed that the average weight-for-age, weight-for- height and height-for-age z-scores were -1.26, -1.60 and -1.21 respectively (Table 2). 32.5% of the children being wasted, 21.1% being underweight and 12.2% being stunted. The prevalence of underweight and wasting were higher among females at the age of 6-12 months while stunting was higher among males at the age of 6-12 months also, as listed in (Table 2). Generally, 82.1% of the target population were malnourished with wasting having the highest percentage followed by underweight and lastly stunting with just 17.9% of the children were normal.

Table 2: Prevalence of malnutrition among children aged below 24 months in South West

Indicators of Nutritional status	Gender		Age groups (months)			Total %
	Male n (%)	Female n (%)	0-6 months n (%)	6-12 months n (%)	12-18 months n (%)	
Weight-for-age z-score						
Underweight (<-2 SD)	9 (17.3)	17(23.9)	9(16.7%)	11(25.0%)	6(24.0%)	**21.1**
Severe underweight (<-3 SD)	2(3.8)	2(2.8)	2(3.7)	1(2.3)	1(4.0)	**3.3**
Weight-for-height z-score						
Wasting (<-2 SD)	16(30.8)	24(33.8)	17(31.5)	18(40.9)	5(20.0)	**32.5**
Severe wasting (<-3 SD)	6(11.5)	5(7.0)	7(13.0)	3(6.8)	1(4.0)	**8.9**
Length-for-age z-score						
Stunting (<-2 SD)	8(15.4)	7(9.9)	5(9.3)	7(15.9)	3(12.0)	**12.2**
Severe stunting (<-3 SD)	4(7.7)	1(1.4)	1(1.9)	2(4.5)	2(8.0)	**4.1**
Normal	7(13.5)	15(21.1)	13(24.1)	2(4.5)	7(28.0)	**17.9**

Association of Socio-Demography and CF Practices with Underweight, Wasting and Stunting

The association of some anthropometric indices, sociodemographic data and complementary feeding practices are shown in (Tables 3). The results showed that exclusive (p=0.017) breastfeeding, number of times a baby eats fruit (0.047) and number of times feeding bottle was cleaned (p=0.023) are significantly associated to wasting. Type of complementary food (p=0.009) is significantly associated to underweight and

lastly number of children at home (p=0.036) is significantly associated with stunting. All the other socio-demographic characteristics are not significantly associated with underweight, wasting and stunting.

Table 3a: Bivariate analysis of nutritional status by complementary feeding and socio-demographic indicators

Complementary feeding and socio-demographic indicator	Wasting n (%)	P	Underweight n (%)	P	Stunting n (%)	P
Sex of the child						
Female	25(62.5)	0.536	9(34.6)	0.425	8(53.3)	0.319
Male	15(37.5)		17(65.4)		7(46.7)	
Age of the child						
0-5 months	18(40.0)	0.125	9(34.6)		5(33.3)	
6-11 months	18(40.0)		11(42.3)	0.506	7(46.7)	0.587
12-18 months	4(10.0)		6(23.1)		3(20.0)	
Birth order of the child						
1 to 2	16(40.0)	0.819	8(30.8)	0.213	8(53.3)	0.319
3 to 4	24(60.0)		18(69.2)		7(46.7)	
Location						
Town	15(37.5)		5(19.2)		2(13.3)	
City	11(27.5)	0.065	15(57.7)	0.475	7(46.7)	0.212
Village	10(25.0)		4(15.4)		3(20.0)	
Sub-urban area	4(10.0)		2(7.7)		3(20.0)	
Age of the father (yr)						
20 to 30	5(12.5)		6(23.1)		2(13.3)	
31 to 39	20(50.0)	0.804	10(38.5)	0.410	7(46.7)	0.960
≥ 40	15(37.5)		10(38.5)		6(40.0)	
Employment status of the father						
Employed	17(42.5)	0.972	9(34.6)	0.373	7(46.7)	
Unemployed	23(57.5)		17(65.4)		8(53.3)	0.713
Employment type of father						
Self-employed	11(27.5)	0.978	2(7.7)		3(20.0)	
Government	3(7.5)		3(11.5)	0.106	2(13.3)	0.856
Private	5(12.5		5(19.2)		2(13.3)	
None	21(52.5)		16(61.5)		8(53.7)	

Table 3b: *Bivariate analysis of nutritional status by complementary feeding and socio-demographic indicators*

Complementary feeding and socio-demographic indicator	Wasting n (%)	P	Underweight n (%)	P	Stunting n (%)	P
Educational level of father						
Primary	14(35.0)	0.444	12(46.2)		4(26.7)	
Secondary	9(22.5)		7(26.9)		5(33.3)	0.776
High school	13(32.5)		6(23.1)	0.629	4(26.7)	
University	4(10.0)		1(3.8)		2(13.3)	
Age of mother(yr)						
20-30	14(35.0)	0.463	9(34.6)		2(13.3)	
31-39	23(57.5)		16(61.5)	0.396	10(66.7)	0.234
>40	3(7.5)		1(3.8)		3(20.0)	
Employment status of mother						
Employed	23(57.5)	0.064	11(42.3)		6(40.0)	0.646
Unemployed	17(42.5)		15(57.7)	0.710	9(60.0)	
Employment type of mother						
Self employed	13(32.5)		6(23.1)		3(20.0)	
Government	7(17.5)	0.317	4(15.4)		2(13.3)	0.953
Private	3(7.5)		1(3.8)	0.879	1(6.7	
None	17(42.5)		15(57.7)		9(60.0)	
Education level of mother						
Primary	18(45.0)		10(38.5)		8(53.3)	
Secondary	11(27.5)	0.437	8(30.8)	0.843	4(26.7)	0.520
High school	8(20.0)		7(26.9)		3(20.0)	
Family size						
2-4	16(40.0)	0.305	11(42.3)		3(20.0)	
5-6	17(42.5)		7(26.9)	0.067	7(46.7)	0.435
7 and above	7(17.5)		8(30.8)		5(33.3)	

Table 3c: *Bivariate analysis of nutritional status by complementary feeding and socio-demographic indicators*

Complementary feeding and socio-demographic indicator	Wasting n (%)	P	Underweight n (%)	P	Stunting n (%)	P
Marital status						
Currently married	18(45.0)		12(46.2)		7(46.7)	0.613
Currently unmarried	21(52.5)	0.100	14(53.8)	0.420	8(53.3)	
Formerly married	1(2.5)		0(0.0)		0(0.0)	

Bernard Tiencheu, *et al.* (2021). Association between Socio-Demographic Factors, Adequacy of Breastfeeding Practices and Complementary Food for Children below 24 Months in Fako, South West Region of Cameroon. *CPQ Nutrition, 4*(2), 01-20.

Parents religion						
Both Christians	31(77.5)		20(76.1)	0.667	13(86.7)	0.296
Both muslims	4(10.0)	0.469	4(15.4)		0(0.0)	
1 christian, 1 muslim	5(12.5)		2(7.7)		2(13.3)	
Hereditary disease						
Yes	7(17.5)	0.673	8(30.8)	0.109	2(14.3)	0.590
No	33(82.5)		18(69.2)		12(85.7)	
Congenital disease						
Yes	10(25.0)	0.913	3(11.5)	0.086	6(40.0)	0.133
No	30(75.0)		23(88.5)		9(60.0)	
Exclusive breastfeeding						
Yes	16(41.0)	0.017*	3(11.5)	0.045	3(20.0)	0.512
No	23(59.0)		23(88.5)		12(80.0)	
Prolong breastfeeding						
Yes	4(10.0)	0.491	3(11.5)	0.802	2(13.3)	0.968
No	36(90.0)		23(88.5)		13(86.7)	
Nipple cleaning						
Always	26(65.0)		15(57.7)		9(60.0)	
Sometimes	6(15.0)	0.321	4(15.4)	0.887	3(20.0)	0.851
Never	8(20.0)		7(26.9)		3(20.0)	
Time CF introduced						
<3 months	23(57.5)		16(61.5)		10(66.7)	0.760
3-6months	14(35.0)	0.348	8(30.8)	0.838	3(20.0)	
>6months	3(7.5)		2(7.1)		2(13.3)	

Table 3d: *Bivariate analysis of nutritional status by complementary feeding and socio–demographic indicators*

Complementary feeding and socio-demographic indicator	Wasting n (%)	P	Underweight n(%)	P	Stunting n(%)	P
Type of complementary food						
Homemade	25(62.5)		16(61.5)		6(40.0)	0.274
Locally produced	9(22.5)	0.377	4(15.4)	0.009*	6(40.0)	
Standard food	0(0.0)		4(15.4)		1(6.7)	
Homemade meal for everyone	6(15.0)		2(7.7)		2(13.3)	
Standard CF Preferred						
Phosphatine	16(40.0)		9(34.6)		6(40.0)	

Cerelac	9(22.5)	0.584	6(23.1)	0.317	1(6.7)	0.382
Blesolac	9(22.5)		4(15.4)		3(20.0)	
Average meal freq						
Once	1(2.5)		1(3.8)		2(13.3)	0.335
Twice	24(60.0)		13(50.0)	0.590	6(40.0)	
Thrice	5(12.5)	0.099	4(15.4)		5(33.3)	
Water source						
Tap	20(50.0)		16(61.5)		8(53.3)	0.796
Mineral	8(20.0)	0.184	5(19.2)	0.934	4(26.7)	
Forage	9(22.5)		3(11.5)		1(6.7)	
Well water	3(7.5)		2(7.7)		2(13.3)	
Where baby's food is stored						
Feeding bottle	12(30.0)		9(34.6)		6(40.0)	0.998
Bowl	14(35.0)	0.261	10(38.5)		5(33.3)	
Cup	5(12.5)		4(15.4)	0.807	2(13.3)	
Pot	9(22.5)		3(11.5)		2(13.3)	
Number of times baby eats meat						
Once	9(22.5)		11(42.3)		4(26.7)	0.682
Twice	10(25.5)		6(23.1)	0.670	3(20.0)	
Thrice	1(2.5)	0.202	0(0.0)		0(0.0)	
Never	20(50.0)		9(34.6)		8(53.3)	

Table 3e: *Bivariate analysis of nutritional status by complementary feeding and socio–demographic indicators*

Complementary feeding and socio-demographic indicator	Wasting n (%)	*P*	Underweight n(%)	*P*	Stunting n(%)	*P*
Number of times baby eat fish						
Once	13(32.5)		7(26.9)		5(33.3)	0.263
Twice	10(25.0)	0.962	6(23.1)	0.776	6(40.0)	
Never	7(42.5)		13(50.0)		4(26.7)	
Number of times baby eat vegetable						
Once	15(37.5)		8(30.8)		5(33.3)	0.508
Twice	12(30.0)	0.526	8(30.8)	0.982	6(40.0)	
Never	13(32.5)		10(38.5)		4(26.7)	

Number of times baby eat fruits							
Once	7(17.5)		8(30.8)		5(33.3)	0.962
Twice	12(30.0)	0.047*	7(26.9)	0.941	4(26.7)	
Never	21(52.5)		11(42.3)		6(40.0)	
Does baby take any multivitamin supplement							
Yes	13(32.5)	0.789	8(30.8)		4(26.7)	0.705
No	27(67.5)		18(69.2)	0.988	11(73.3)	
Feeding method used							
Spoon	12(30.0)		12(46.2)		3(20.0)	
Hands	4(10.0)		2(7.7)		1(6.7)	0.437
Feeding bottle	22(55.0)	0.978	10(38.5)	0.275	9(60.0)	
Cup	2(5.0)		2(7.7)		2(13.3)	
How often you wash hands							
Sometimes	25(62.5)		9(34.6)		7(46.7)	
Always	7(17.5)	0.111	5(19.2)	0.137	5(33.3)	0.308
Never	8(20.0)		12(46.2)		3(20.0)	

Table 3f: Bivariate analysis of nutritional status by complementary feeding and socio-demographic indicators

Complementary feeding and socio-demographic indicator	Wasting n (%)	*P*	Underweight n(%)	*P*	Stunting n(%)	*P*
Cleaning feeding bottle						
Once	16(40.0)		12(46.2)		10(66.7)	
Twice	17(42.5)	0.023*	6(23.1)	0.334	2(13.3)	0.625
Thrice	3(7.5)		1(3.8)		1(6.7)	
After every meal	4(10.4)		7(26.8)		2(13.3)	
Number of people working						
One person	23(57.5)	0.199	11(42.3)	0.429	9(60.0)	0.371
Two people	17(42.5)		15(57.7)		6(40.0)	
Number of children						
One to three	30(75)	0.215	18(69.2)	0.831	6(42.9)	0.036*
Greater than equal to 4	10(25)		8(30.8)		8(57.1)	
Number of times breastfed						
Two times			8(30.8)		5(33.3)	0.137
Three times			6(23.1)	0.063	5(33.3)	
>three times			12(46.2)		5(33.3)	

Discussions

Breast feeding although is regarded as the most important protective factor for children's health in the first two years but also proper complementary food practices are quite vital for the promotion of this effect after the age of 6 months and especially during the second year of life and thereafter. Nutrition screening and evaluation have become integral part of many parts of health care and supplemental food programs for infants and children. Community based nutrition surveys provide an accurate idea about food administered to children. It can give an idea about the approximate caloric intake per day. Dietary screening is aimed at identifying those infants and children who may appear to have nutritional problems. Although the information it gives are rather qualitative, it can be concluded from these, who are the children that are at risk of malnutrition [8]. This survey has revealed that malnutrition is still a serious childhood problem in South west region of Cameroon. Its etiology is more than due to the effect of economic status of the community but other important causes should be considered. Mother's related factors are on the top of the factors that directly affect the health of their children particularly nutrition.

The proportions of children on prolonged and exclusive breastfeeding were still very low at 13% and 27.6% respectively (Table 1). This was in line with the data on exclusive breastfeeding in Aceh in the last decade, which was lower than the national average (Aceh Timur, 2012). Although in places like Indonesia Sharp reductions were seen in 2007, 2009 and 2010 with proportions of 11.4%, 8.5% and 4.3%, respectively [9]. In terms of the timeliness of introduction to CF, this study found less than half (9.8%) of the children received CF timely, while the rest were introduced earlier (63% at < 3 months, 26.8% at 3-6 months). These findings are on the same line with the observations of University of Indonesia (UI) and UNICEF in Aceh (Indonesia), that showed that at age < 3months, the children were given food, namely water, formula milk, fresh milk and other food (grains, pumpkins, sweet potatoes, food made of roots and tubers) [10].

Most of children consumed more of homemade foods like pap (61.0%) and more than half of the children did not receive iron or multivitamin syrup supplementation while majority of them did not consume meat at all (39.8%), with some consuming meat once a week (35.8%), others receiving it twice a week (22.0%) and others thrice a week (2.4%). Most of them did not consume fish at all (43.1%), with some consuming fish once (30.9%), and the rest consumed it twice a week (26.0%). Majority of the children had never consumed vegetables (39.0%) with some of them consuming vegetables once a week (31.7%), and others consuming vegetable twice a week (29.3%). Most of the children never consumed fruits (43.1%), some of them consumed fruits once a week (32.5%), with others consuming fruits twice a week (24.4%), thus justifying the high prevalence of malnutrition (82.1%) observed among these children. Another justification could be as a result of the fact that the majority of their mothers were not workers (55.3%) and had ended in primary school (38.2.7%). The other reason can be the family size of the children that was mostly 5-6 (46.3%) people with income less than 50,00frs per month.

Low consumption of vegetables and fruits observed in this study corroborate with the work of Kimiywe *et al.*, (2015) [11] in Kenya that revealed that fruits and vegetables consumption frequency among children between 6-23 months was less than 25.4% (for those who consumed once a week). Mbithe *et al.*, (2017) [12] also reported poor consumption rate of vegetables and fruits (20%) (between the children aged 6-23 months). Furthermore, Na *et al.*, (2017) mentioned that consumption of legumes, fruits and vitamin A-rich

vegetables in Pakistan was very low (6-19%). Poor CF practice of children aged 6-23 months is known to be caused or influenced by many factors [13] such as: mother's educational level, birth order of a child and socio-economic status [14,15].

In summary, CF practices of children aged 6-23 months were below standard (inadequate). Among all indicators of CF practices recommended by WHO, the other indicators, namely exclusive breastfeeding, timely introduction to complementary food and iron- and vitamin A-rich food consumption, were still below standard (inadequate). Underweight (<-2SD W/H), Wasting (<-2SD W/H) and Stunting (<-2SD H/A) remained crucial problems since their prevalence exceeded the cut-off point of public health problem categorized as acute and chronic malnutrition [16].

The complementary foods were predominantly made of starch-based cereals and hence of poor nutritional value, and do not satisfy the infant's basic needs of protein because they have limited levels of protein both qualitatively and quantitatively. Thus, macro- and micronutrients may be insufficient to maintain growth and development, this resulting in poor nutritional status in children [17-64].

Conclusion

Hence, we can conclude that Socio-demographic factor like family income, poor breastfeeding practices and inadequate complementary foods are associated and all contribute to the poor nutritional status of children.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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