RESEARCH ARTICLE

MALNUTRITION IN THE HEALTH DISTRICT OF ABONG MBANG, CAMEROON

Samuel Nambile Cumber[2,3], *Jackson Jr N. Ndenkeh[1,2,4], Joyce Mahlako Tsoka-Gwegweni[3], Joseph Noupoue[4], Djouma Nembot Fabrice[2] and Thomas A. Vukugah[1].

1. Department of Biomedical Sciences, University of Dschang, Cameroon.
2. Under Privileged Children And Women Assistance (UPCAWA), Cameroon.
3. Discipline of Public Health Medicine, Department of Nursing & Public Health, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa.
4. District Health Service of Abong Mbang, Cameroon.

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Manuscript Info	Abstract
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Introduction: Malnutrition still remains a major public health problem in Cameroon affecting mostly the Northern and Eastern regions of the country. Despite the interventions put in place by the government and other stake holders to eradicate poverty and ameliorate food security the problem still endures with severity changing with respect to space and time. This study was thus conducted with the objective to describe with respect to time and geographical locations the distribution of malnutrition amongst children in the Health District of Abong Mbang taking into consideration the mechanisms already put in place for response.

Methods: This study was a documentary investigation of the incidence of malnutrition using data amongst collected in the Health District of Abong Mbang from January 2015 through June 2016. The various sources of data used include the monthly activity reports as well as the most recent integrated activity supervision and quality control reports.

Results: The results of this study show a significant increase in the incidence of malnutrition in 2016 as compared with 2015. Also the health areas around the town had the tendency of reporting more cases than the rural health areas as well as there was a general problem of availability of resources in most of the health facilities as concerns malnutrition leading to a general weakness in the quality of services offered with respect to its response.

Conclusion: The reported incidence of malnutrition in the Health District of Abong Mbang is alarmingly increasing. There is the need to train the personnel on essential actions on malnutrition prevention while providing the resources needed and ensuring an effective implementation of the knowledge acquired through formative supervision. Also there is the need to vulgarize the organization of nutrition demonstration sessions in the communities using local foods by the above trained health personnel.

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Corresponding Author:- Jackson Jr N. Ndenkeh.
Address:- Department of Biomedical Sciences, University of Dschang, Cameroon.

Introduction:-

Good nutrition signals the realisation of people's rights to food and health. It reflects a narrowing of the inequalities in our world. Without good nutrition, human beings cannot achieve their full potential. When nutrition status improves, it helps break the intergenerational cycle of poverty, generates broad-based economic growth, and leads to a host of positive consequences for individuals, families, communities and countries. Malnutrition is a problem of staggering size worldwide; large enough to threaten the world's sustainable development ambitions for the post-2015 period. Malnutrition affects all countries and almost one in three people on the planet (1). Malnutrition remains a public health problem in Cameroon with most of its vulnerable group being children under five, pregnant women and breast feeding mother (2). In Cameroon, the situation keeps deteriorating with an estimated 229 000 cases of malnourished children were noted at the start of 2015 of whom 34% were severe cases, compared to 186 000 cases noted in 2014 of whom 29% were severe cases (3). It was also noted that 8 out of 10 cases of malnutrition came from the North and Far North regions of Cameroon with more than half of the remainder coming from the East region of the country (3). In 2011, according to the Cameroon Demographic and Health Survey and Multiple Indicators Clusters Survey about 33% of children under 5 years suffered from chronic malnutrition and 14% have reached the severe stage. Also 6% suffer from acute malnutrition with 2% of which are severe (1). The food security and nutrition situation in Cameroon has deteriorated due to multiple shocks such as the influx of refugees from the Central African Republic and Nigeria, increasing insecurity and natural disasters as well as other internal factors like food availability, accessibility and affordability. In early 2015, the number of food insecure people stands three times higher than two years ago, affecting one out of seven people with the worst hit regions being the Far North, North and East regions of the country (4). Even in these most affected regions named above the incidence of malnutrition varies differently with respect to time, places and persons with the highest affected age group being children. The distribution of the above influencing factors also vary amongst the Health Districts thus entailing the specification of interventions in these communities for a better impact on the inhabitants. This study was conducted with the objective to describe with respect to time and geographical locations the distribution of malnutrition amongst children in the Health District of Abong Mbang taking into consideration the mechanisms already put in place for response. This information would help in understanding the problem in a local context and thus provide practical recommendations with a direct impact on the population of the Health District of Abong Mbang.

Methodology:-

This was documentary investigation conducted in the Health District of Abong Mbang which is found in the East region of Cameroon and bordered by other Health Districts like Messamena, Lomié, Abong Mbang, Doumé and Nguelemedouka. This Health District is bordered to the boundary with Centrafrique by Yokadouma and possesses no camps for refugees from the latter country. This study was thus carried out using data from monthly activity reports from the various health areas as well as the most recent reports of integrated activity supervision and quality control for the various health facilities in the Health District. The activity reports dated from January 2015 to June 2016 while the supervisions used were conducted in July 2016. The data were collected from the monthly reports focus on children less than 5 years with the data entered, analyzed and graphically presented using the software GraphPad Prism v6. Frequencies were calculated where appropriate as well as comparison done using the Chi^2 test with significance set at 5%.

Results:-

The Health District of Abong Mbang is made up of a total population of 73,703 and children population of 14004 sub-divided into 12 health areas as shown in table 1 below. Amongst these health areas the most urbanized ones are the Abong Mbang North, South and Center while the rural and furthest ones from the town of Abong Mbang include Djaposten, Mindourou and Akok Maka. The most populated of these health areas include Angossas, Mbomba and Abong Mbang South with populations of 10694, 9825 and 8833 respectively. Each health area has at least one Integrated/Community Health Center (which can be public, private for profit making or confessional) in addition to two Sub-Divisional Medical Centers found in Angossas and Atok as well as a District Hospital found in Abong Mbang South, summing up to a total of 22 functional health facilities.

Table 1:- Demographic information of the Health District

| No	Health area	General population	Population of children
1	Abong Mbang Centre	6957	1322
2	Abong Mbang North	6455	1226
3	Abong Mbang South	8833	1678
4	Akok Maka	5685	1080
5	Angossas	10694	2032
6	Ankoung	3092	587
7	Atok	6776	1287
8	Djaposten	2696	512
9	Kwoamb	627	119
10	Mbomba	9825	1867
11	Mindourou	5932	1127
12	Nkouak	6131	1165
	TOTAL	**73703**	**14004**

As shown in Figure 1 below, in 2015 we noted fluctuating incidence of malnutrition throughout the year with lowest in March and highest in May with 1 and 41 cases observed respectively. These trends were generally low as compared to the trends observed in the 6 months of the year 2016 where the lowest case notifies was 10 cases in the month of May. In the whole of 2015, 182 cases of malnutrition in children were reported while only within the first 6 months of the year 2016, 130 cases were reported. When comparing the incidence of malnutrition within the first 6 months of both years (taking into consideration the target populations for both years), we noted a statistically significant increase in the first two trimesters of 2016 as compared to the same time period in 2015; with Chi^2 value and p-value of 12.83 and 0.0003 respectively (Figure 2).
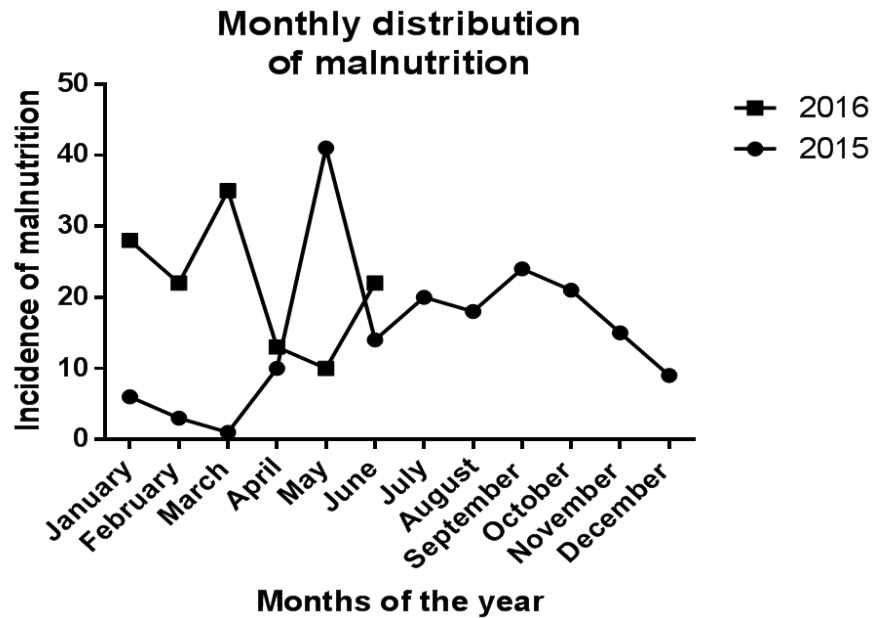
Figure 1:- Incidence of malnutrition in Abong Mbang

Comparison of incidence of malnutrition
**Chi-square; df= 12.83; 1 p-value= 0.0003**
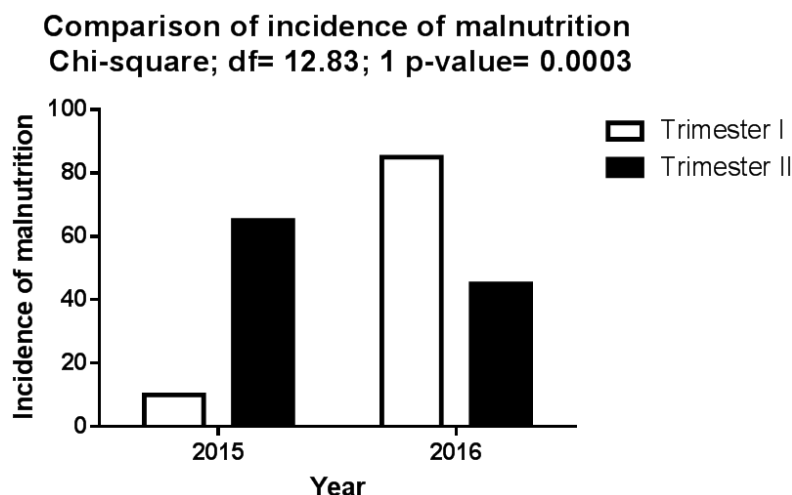
Figure 2:- Comparison of the incidence of malnutrition

As concerns the geographical distribution of malnutrition figure 3 below shows incidence with respect to the various health areas. Here within the entire period of the study, the highest incidences were noted in health areas like Abong Mbang Centre, Abong Mbang Sud, Mbomba and Abong Mbang North with 87, 48, 47 and 39 cases of malnutrition respectively. Mindourou health area on the other hand reported no case of malnutrition while Akok Maka reported only one case during the period of the study.

Distribution of Malnutrition per H/A
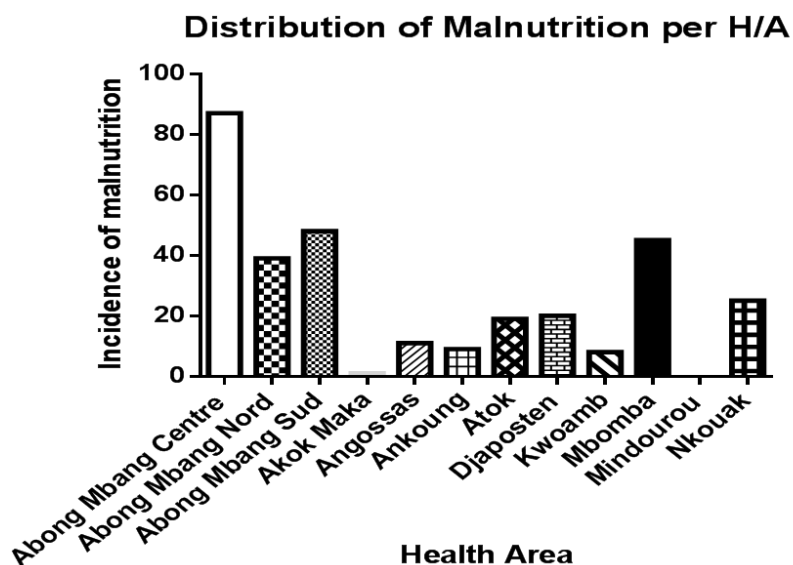
**Figure 3:-** Incidence of malnutrition per health area

Using data from the most recent integrated activity supervision of the various health facilities in the Health District of Abong Mbang, the following concerning availability of an important number of resources in the domain of nutrition were noted as shown on figure 4 below. Only 45% of the health facilities supervised had available trained personnel in prevention and management of malnutrition. The above proportion was even lower by more than half (20%) when availability of trained community relays for malnutrition detection was concerned. There were only 20% of the health facilities possessing local foods which could be used for nutritional demonstrations with only 5% organizing nutritional demonstrations in the communities using local foods. The same tendency was noted for community detection and management of malnutrition with 40% and 10% of the health facilities having trained personnel in rapid detection and management of malnutrition and community management follow up respectively. As concerns the inputs needed for moderated and severe acute malnutrition (like sup plumpy and plumpy nut) we noted that 10% and 85% having them respectively.

Availability of resources
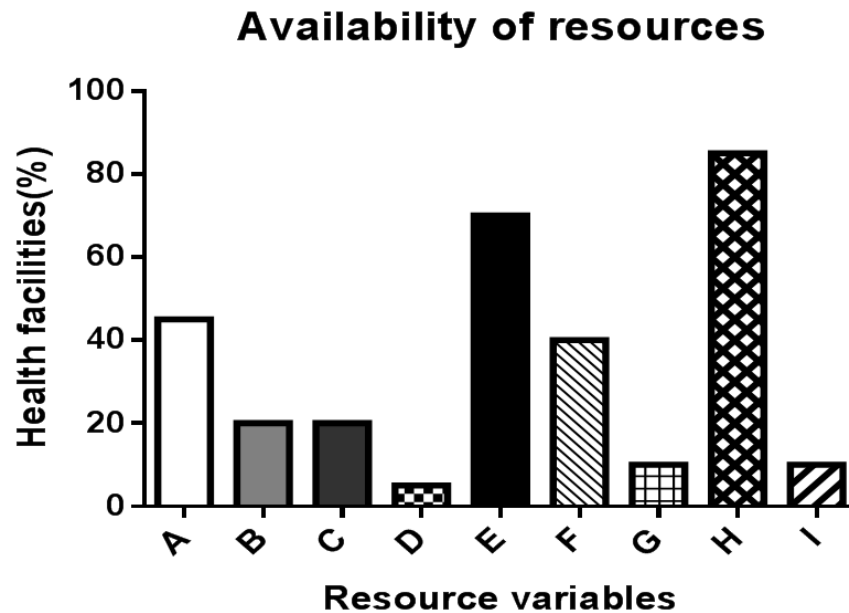
Figure 4:- Availability of resources for the prevention of malnutrition

*NB: **A**; trained personnel, **B**; trained community relays, **C**; local foods for nutritional demonstrations, **D**; demonstration sessions organized, **E**; Micronutrient supplementations, **F**; personnel trained in rapid detection and management, **G**; sup plumpy, **H**; plumpy nut and **I**; community management follow up system*

Using data from the most recent quality control assessment of the various health facilities in the Health District of Abong Mbang, the following as concerning quality of service in the domain of prevention and management of malnutrition were noted as shown on figure 5 below. Here after self-defining and categorizing the quality of service as shown on the chart below figure 5, we noted that none of the health facilities assessed had the quality control mark in the domain of malnutrition above 85%. About 33.3% of them were categorized as good, 14.3% and more than half (52.4%) being categorized as poor (having their quality control mark in the domain of malnutrition prevention below 50%).

Quality of services in the domain of malnutrition prevention
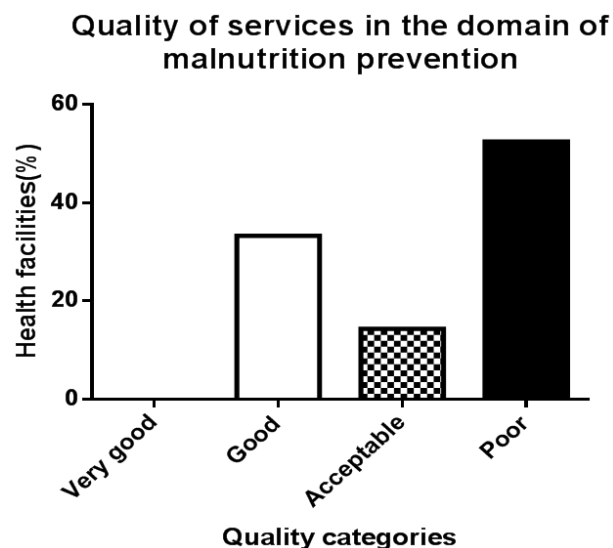
Figure 5:- Quality of services in line with prevention of malnutrition

*NB: **Very good**; 85%-100%, **Good**; 65%-85%, **Acceptable**; 50%-65% and **Poor**; <50%*

Discussion:-

Malnutrition is one of the most important health and welfare problems among infants and young children in Cameroon. It is a result of both inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food available at the household level, improper feeding practices, or both. Improper feeding practices include both the quality and quantity of foods offered to young children as well as the timing of their introduction. This study was implemented with the aim of having a practical and updated picture of malnutrition in a Health District in the East region of Cameroon. Note should be taken that this Health District is not very much affected by refugee entry and internal displacement of persons. This study was carried out using monthly activity reports for 2015 and the first half of 2016 as well as the most recent integrated activity supervision and quality control reports.

A significant increase in the incidence of malnutrition was noted in Abong Mbang between 2015 and 2016. Throughout the year of 2015, 182 cases of malnutrition in children was noted but only within the first 6 months of 2016, 130 cases of malnutrition in children have already been recorded. This increasing trend goes in line with the general trend noted between 2014 and 2015 (4). This could be due to an actual increase in the incidence of malnutrition in the District and/or due to a better and more effective system put in place in some of the health facilities to detect malnutrition in the population as compared to the previous years. The increase can also be linked to the increasing problem of poor water quality in the Health District thus intestinal infections leading to diarrhea, loss of appetite and subsequent malnutrition (5).

The trends of malnutrition amongst children in the Health District of Abong Mbang show that it seem to be more concentrated around the town of Abong Mbang with the most affected health areas being those found around the town. This can be due to problems of availability and/or affordability of foods in the town. It could also be due to the fact that cases come from the villages to the District Hospital and/or other better structured private clinics in the town for case management thus are counted in the health areas where those health facilities are found. On the other hand some rural health areas like Akok Maka and Mindourou showed very low or no case of malnutrition for the time duration of the study. The result of this study in terms of geographical distribution is in contrary to the research of Smith et al in the year 2004 which showed that malnutrition affects most the rural setting than the urban setting (6). This difference could be due to the problem of reporting since most health facilities don't effectively have trained personnel in the detection and management of malnourished children; as noted from the incomplete nature of some of the forwarded monthly reports. Due to the inclusion of malnutrition indicators especially the detection aspect in the indicators of PBF (Performance Based Financing), the fact that the health facility chiefs could just be reporting values to get more funding rather than giving exact values should not be neglected. So with all of the above points of explanation, the assertion of more cases found in the urban health areas and less cases noted in the rural health areas cannot be confirmed with certitude. Also despite the incertitude at the level of the quality of data on the incidence of cases, this does not mean there are no cases but on the contrary could show also that more of those cases can still be lingering in the community unnoticed and unmanaged.

The results gotten in line with the availability of resources and quality of services for the prevention of malnutrition in the Health District of Abong Mbang showed a general insufficiency in personnel training and resources. The first factor most importantly crippled the functioning of the malnutrition prevention units in the various health facilities. The general lack at the level of the quality of health services in line with prevention of malnutrition is but logical in accordance to the study of Mosadeghrad in 2014 showing that health care quality can be improved by supportive visionary leadership, proper planning, education and training, availability of resources, effective management of resources, employees and processes, and collaboration and cooperation among providers (7).

The situation was even worse as concerns community detection and management of cases with only about 20% having trained community relays and an even lesser proportion having a community management follow up system put in place. It was noted that most health facilities did not have community management follow up systems put in place. It is liable that with the present system put in place, most of the cases reported are those brought to the health facilities meaning most likely that quite good number moderated cases won't be noticed. Also amongst those who checked out less is being done for their community follow up. The community of Abong Mbang needs to be fully implicated in the response against malnutrition since it will only be with their active participation through the planning and implementation of activities like community detection of cases, the organization of food demonstration sessions using local foods and other communication for behavioral change in the community (8, 9).

Conclusion and Recommendations:-

To conclude we can say that reported incidence of malnutrition in the Health District of Abong Mbang has significantly increased as compared to last year. Despite the government and other stake holders like the UNICEF already putting in place units in most of the health facilities for response, the effective functionality of these units is not yet optimal due to a good number of setbacks from availability of resources, training and effective implementation of response activities. Three factors are involved in making interventions effective which include training of personnel, motivation and monitoring of activities but with the second already put in place by the PBF, more attention should thus be drifted towards training and monitoring of the activities implemented. There is thus the need to increase qualified personnel and/or train the available personnel on response actions to malnutrition. Also the trained personnel have to be followed up for effective implementation of acquired knowledge through regular formative supervisions though self-motivation is most wanted aspect here. In the same light, there is the need to vulgarize the organization of nutrition demonstration sessions in the communities using local foods by the above trained health personnel. As concerns the availability and accessibility problems should be handled by promoting extensive farming such that there will be sufficient local foods for the local communities as well as the town thus directly influencing affordability of foods in the town markets.

Declarations:-

Ethics approval and consent to participate: This study was a documentary investigation using already archived and publicly accessible data in the District Health Service of Abong Mbang. The data used was not labeled with any individual identifiers neither can it be re-identified to any individual, group of indigenous persons or village in the Health district of Abong Mbang. Prior to usage of the above data a written administrative authorization was received from the District Medical Officer who actively participated and supervised this work. This study thus is an exempt from Research Ethics Board review in accordance to Article 2.2 of the Interagency Advisory Panel on Research Ethics (Canada) that stipulates « research that relies exclusively on publicly available information does not require REB review when: the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy. »

Competing interests: The authors declare that they have no competing interests.

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