



Community perceptions of the risk factors of maternal and child malnutrition in the district of Zè, Benin

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Perceptions communautaires des facteurs de risque de la malnutrition chez la mère et l'enfant dans la Commune de Zè, Bénin

Résumé:

Introduction: Lutter contre la malnutrition nécessite inévitablement une bonne compréhension de ses causes. Cette étude vise principalement à comprendre les perceptions communautaires de deux facteurs de risque majeurs de la malnutrition par carence chez les mères et les enfants dans la commune de Zè, Bénin.

Méthodologie: C'est une étude transversale qui a associé des méthodes quantitatives et qualitatives. Elle s'est déroulée dans le village de Domè-Sèko dans la commune de Zè et a porté sur 64 couples de mères et d'enfants âgés de 6 à 59 mois. Des données ont été collectées par questionnaire sur le niveau d'insécurité alimentaire des ménages et la diversité alimentaire des mères et des enfants. Leur état nutritionnel a été évalué par anthropométrie. Huit séances de discussion de groupe ont été organisées, séparément, avec des hommes actifs, des hommes âgés, des femmes en âge de procréer et des femmes âgées, sélectionnés par convenance. L'association de l'état nutritionnel des mères ou celui des enfants avec la diversité alimentaire et la sécurité alimentaire des ménages a été testée par régression linéaire simple. Les données qualitatives ont été classées par catégorie de participants des discussions de groupe, codées à l'aide du logiciel NVIVO, et utilisées pour expliquer les résultats quantitatifs.

Résultats: L'émaciation, l'insuffisance pondérale et le retard de croissance touchaient respectivement 6,3%, 18,8% et 57,8% des enfants. La prévalence du déficit énergétique chronique était de 9% chez les mères et 13% étaient en surpoids ou obèses. Seuls 21% des enfants de 6 à 23 mois avaient atteint la diversité alimentaire minimale et 15%, le régime alimentaire minimum acceptable. Le score moyen de diversité alimentaire chez les mères et les enfants de 24 à 59 mois était de 5 ± 1 parmi 14 groupes d'aliments. L'insécurité alimentaire était présente dans 80% des ménages et 53% étaient sévèrement affectés. Outre la faible diversification de l'alimentation, les discussions de groupe ont identifié la faible contribution des hommes à l'approvisionnement alimentaire des ménages, l'assainissement médiocre du milieu de vie, l'utilisation insuffisante des services de santé, en raison de certaines croyances culturelles et d'un mauvais accueil des agents, comme facteurs de risque principaux de la sous-nutrition maternelle et infantile.

Conclusion: La commune de Zè demeure très désavantagée malgré de nombreuses interventions nutritionnelles. Au-delà des données quantitatives, les perceptions de la communauté ont permis de mieux comprendre les facteurs de risque de la malnutrition maternelle et infantile spécifiques au contexte, ce qui contribuera à affiner les stratégies d'intervention par une approche plus participative.

Mots clés : Mères, enfants, malnutrition, facteurs de risque, Commune de Zè, Bénin.

Abstract :

Introduction: Fighting malnutrition inevitably requires good understanding of its causes. This study aims primarily to understand community perceptions of two major risk factors of maternal and child undernutrition in the district of Zè, Benin.

Methodology: The study used a cross-sectional mixed design. It was conducted in the village of Domè-Sèko in Zè. Participants were 64 pairs of mothers and 6-59 months old children. Questionnaires were used to collect data on household food insecurity and mothers and children's dietary diversity. Anthropometric variables were measured to assess their nutritional status. Eight focus groups were conducted separately with purposively selected active men, older men, women of childbearing age and older women. Simple linear regression was used to test the association of mothers or children's nutritional status with dietary diversity and household food security. The qualitative data were classified per category of focus group participants, coded using NVIVO software, and used to corroborate the quantitative results.

Results: The prevalence of wasting, underweight and stunting was respectively 6.3%, 18.8% and 57.8% among the children. Chronic energy deficiency affected 9% of mothers, 13% were overweight or obese. Only 21% of children aged 6-23 months had the minimum dietary diversity and 15% the minimum acceptable diet. Average dietary diversity score of 24-59 months old children and mothers was 5 ± 1 in 14 food groups. Food insecurity affected 80% of households in total, 53% severely. Besides poor dietary diversification, focus groups identified low contribution of men in household food supply, poor sanitation, insufficient utilisation of health services, due to cultural beliefs and bad reception, as main risk factors of mothers and children's undernutrition.

Conclusion: Zè remains highly disadvantaged despite numerous nutritional interventions. Beyond quantitative data, community perceptions gave good insight into context-specific risk factors of maternal and child malnutrition, in view of strategies refinement using a more participatory approach.

Keywords: Mothers, children, malnutrition, risk factors, district of Zè, Benin.

1. Introduction

Malnutrition remains a serious public health problem with at least one in three persons affected worldwide. Specifically, reduction in undernutrition rates is still too slow to achieve global nutrition goals, including the second Sustainable Development Goal by 2030 (Development Initiatives 2017). In Benin, 32.2% of children under 5 years suffer from chronic malnutrition; among them, 10.9% are severely affected (INSAE & ICF 2018). Anaemia affects 57.7% of women of childbearing age, 15-49 years old, and 71.5% of children aged 6 to 59 months at national level (INSAE & ICF 2018). The district of Zè in Benin is a rural area located in the Atlantic region where 30.1% of children under 5 years suffer from chronic malnutrition and 67.5% of 6 to 59 months old children and 60.2% of women of childbearing age are affected by anaemia, which indicates serious public health problems according to the thresholds of the World Health Organization (INSAE & ICF 2018). Zè is one of the districts which have received the most nutrition and health interventions but child undernutrition remains persistent in this area. Clarification of most crucial factors to address in interventions is still needed.

The nutritional status of young children depends on several factors, including their mother's nutritional sta-

tus, socioeconomic position and care practices (Abubakar et al. 2011 ; Muraya et al. 2016 ; Akseer et al. 2018). Additional factors, especially household food insecurity, low dietary diversity and bad feeding practices, have been highlighted in previous studies conducted in Zè and other districts of Benin (Yessoufou et al. 2014 ; Mitchodigni et al. 2017; Zevounou et al. 2017). These studies were only quantitative and no qualitative study has been undertaken. The present study contributes to filling this gap by using a mixed research approach which combines both quantitative and qualitative methods. Qualitative methods are more appropriate to investigate complex determinants such as cultural factors (Bazzano et al. 2017), which are key in the occurrence of child undernutrition (Mengesha & Ayele 2015; Samli et al. 2006). They provide in-depth understanding of community perceptions about such issues. Above all, they are action-oriented and useful to inform intervention development as they give a good appraisal of context-adapted solutions from the perspective of future beneficiaries. The mixed research approach is receiving increased attention in public health as it addresses some research questions more deeply than by using either quantitative or qualitative methods (Tariq & Woodman 2013).

This study aimed at: (i) investigating community perceptions of two potential risk factors of undernutrition in children and their mothers in the district of Zè in Benin, namely household food insecurity and individual

dietary diversity; (ii) getting an insight into other key context-specific risk factors to contribute to the refinement of intervention strategies to alleviate undernutrition in this area.

2. Material and methods

2.1. Sampling

The study was conducted in Domè-Séko, a village of the district of Zè in September 2016. Participants were pairs of children aged 6 to 59 months and their mothers. The required sample size was estimated at 64 mother-child pairs according to Dagnelie (1998), a margin of error of 5%, a prevalence of global acute malnutrition among children under 5 of 4.5% (INSAE 2015) and a reduced normal law statistic of 1.96. A census of eligible mother-child pairs with children aged 6 to 59 months was done and 95 units were identified. Among the identified mothers who gave their written informed consent for the study, 64 mothers were randomly selected together with their youngest child between ages 6 and 59 months.

2.2. Data collection

Four interviewers were trained for data collection. Each of them had at least a Bachelor in nutrition. The training lasted two days and focused on the objectives of the study, data collection methodology, how to administer the questionnaires and how to conduct the focus group discussions. To assess the nutritional status of the mothers and children, anthropometric measurements (weight and height) were done using standard procedures (WHO 1995). Participants' age was also recorded from their health books or estimated by reference to specific events.

Face-to-face interviews were conducted with participating mothers to assess household food insecurity level and maternal and child dietary diversity. The Household Food Insecurity Access Scale (HFIAS) was used. HFIAS is a brief survey instrument developed by the Food and Nutrition Technical Assistance (FANTA) project to determine whether households have faced problems with food access in the previous 30 days (Coates et al. 2007). The instrument consists of nine occurrence questions and nine frequency questions about changes in household diet or food consumption patterns as a result of limited resources to acquire food (Coates et al. 2007).

Dietary diversity was assessed by asking about the food consumed by the mothers and children in the 24 hours preceding the survey. The list of 14 food groups suggested by FAO (2006) was used for mothers and children aged 24 to 59 months. Two recommended indicators of dietary diversity were used for 6 to 23 months old children: the minimum dietary diversity

score and the minimum acceptable diet score. The proportion of children with the minimum dietary diversity was calculated considering children who consumed food from at least 4 different groups among the following seven: cereals, roots and tubers ; pulses and nuts ; dairy products (milk, yoghurt, cheese) ; meat products (meat, poultry, offal) and fish ; eggs ; vitamin A-rich fruits and vegetables ; other fruits and vegetables.

Perceptions of risk factors of maternal and child undernutrition were assessed during eight focus groups, two with each of the following four categories: active men (18 to 65 years old), senior men (older than 65 years), women of childbearing age (15 to 49 years old) and older women (above 65 years of age). Participants ($n = 8$ to 12 per session) to the discussions were purposively selected in the households included in the study. A discussion guide was elaborated beforehand based on risk factors evidenced from the literature. It was structured in four sections, starting from an introduction on the discussion objective and rules, then a transition section with general questions only meant to open the discussion. The third section was the actual discussion and comprised keywords and sample questions about household food access, the diet of under-5 children and mothers, common diseases and undernutrition among under-5 children and mothers, health care, hygiene practices and sociocultural factors. The last section concluded the focus groups. The discussions were audio-recorded and subsequently transcribed in full.

2.3. Data processing and statistical analyses

Anthropometric data obtained from the children were expressed in z-scores of the weight-for-height (W/H) index for acute malnutrition, weight-for-age (W/A) index for underweight and height-for-age (H/A) index for stunting. The ENA 2011 software (copyright © 2003-2015 Micheal Golden / John Seaman / Jurgen Erhardt) was used for this purpose. These z-scores were used at the thresholds of -2SD (standard deviations) and -3SD to define moderate and severe forms of malnutrition respectively. The body mass index (BMI) was calculated for mothers and the following thresholds used: $< 18.5 \text{ kg/m}^2$ for chronic energy deficiency (CED); $18.5 \text{ kg/m}^2 \leq \text{BMI} < 25 \text{ kg/m}^2$ for normal status; $25 \text{ kg/m}^2 \leq \text{BMI} < 30 \text{ kg/m}^2$ for overweight and $\geq 30 \text{ kg/m}^2$ for obesity.

Data obtained from the HFIAS were compiled to categorize households in four groups as recommended : in food security, mild food insecurity, moderate food insecurity and severe food insecurity (Coates et al. 2007). The minimum dietary diversity score and the minimum acceptable diet score were computed for children aged 6 to 23 months. In older children and mothers, the dietary diversity score (DDS) was calculated and three categories were created: low ($\text{DDS} \leq 3$); average ($3 < \text{DDS} \leq 5$) and high ($\text{DDS} > 5$). The R software version 3.2.4

(R Core Team) was used for simple linear regression tests to determine the relationship between the nutritional status of mothers or children and their dietary diversity or the level of household food insecurity.

The NVIVO software version 10.0 (QSR international) was used to process the qualitative data transcribed from the focus groups. Quotes were classified according to the categories of participants (active men, senior men, women of childbearing age and older women) and major topics included in the discussion guide. The qualitative data on household food insecurity (access) and dietary diversification of children and mothers were used to corroborate or elaborate, that is explain, the quantitative results as suggested elsewhere (Brannen 2005). Other risk factors were also highlighted from the qualitative data.

3. Results

3.1. Participants' demographic characteristics and nutritional status

Among the children, 24 (37.5%) were 6 to 23 months old and 40 (62.5%) were between 2 and 5 years of age;

34 (53.1%) of the children were female. Children's mean age was 30±12 months, with an age range of 7 to 57 months. Mothers were 31±5 years on average and between the ages of 16 and 41 years. The main ethnicity among participating mothers was Aizo (96%); Fon and Haoussa were represented each at 2%.

Stunting was the most common form of malnutrition among the children, 57.8% were stunted and 35.9% severely. The prevalence of underweight was 18.8% and included 6.3% children with the severe form. There were no cases of severe acute malnutrition and 6.3% of the children were moderately wasted. Chronic energy deficiency affected 9.4% of mothers (Figure 1).

3.2. Dietary diversity of children and mothers

Among children aged 6 to 23 months, 20.8% had the minimum dietary diversity and 15.0% had the minimum acceptable diet. Cereals, roots and tubers were the most consumed foods by children aged 6 to 23 months and were eaten by all of them (Figure 2). Vitamin A-rich fruits and vegetables were poorly consumed by the children (only 4% of them) and no child consumed eggs.

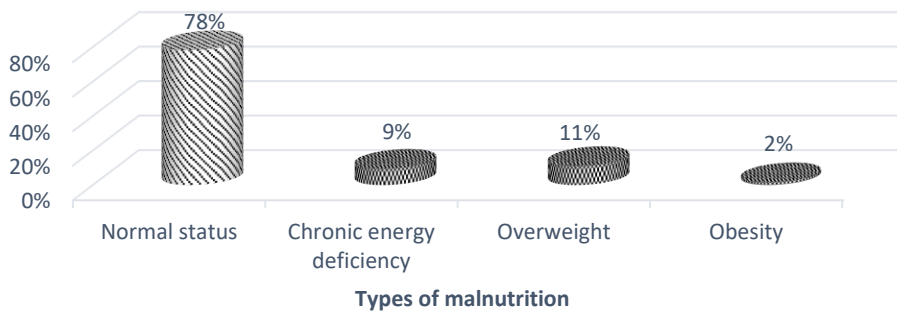


Figure 1: Prevalence of malnutrition among mothers in Domè-Sèko, Benin

[Prévalence de la malnutrition chez les mères à Domè-Sèko, Bénin]

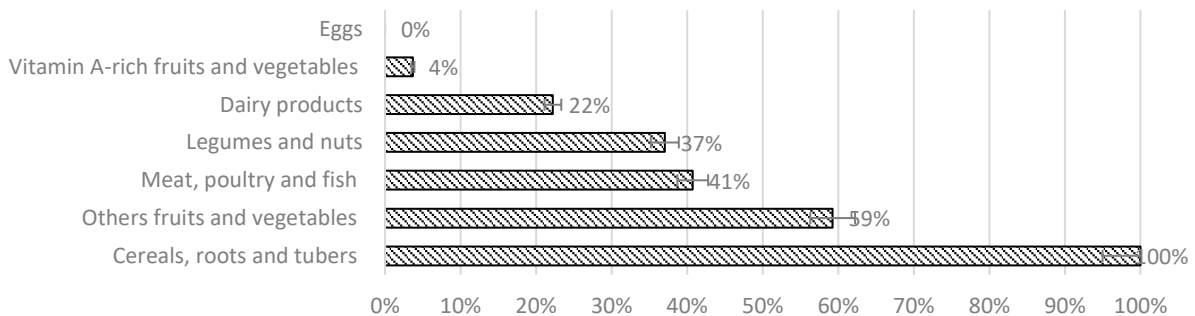


Figure 2: Level of consumption of different food groups by children aged 6 to 23 months in Domè-Sèko, Benin

[Niveau de consommation des différents groupes alimentaires par les enfants de 6 à 23 mois à Domè-Sèko, Bénin]

Among children aged 24 to 59 months, the mean dietary diversity score was 5 ± 1 out of 14 food groups, with a minimum of 3 food groups and a maximum of 9 consumed; 38.7% of the children had a high dietary diversity, 50.0% average dietary diversity and 11.3% low dietary diversity. Table 1 shows children with the lowest dietary diversity usually consume cereals, oils and fats and other fruits (orange, lemon, pineapple and banana). Those with average dietary diversity consume

fish, legumes and other vegetables (tomatoes and onions) in addition to cereals, oils and fats. In addition to all these foods, children with the highest dietary diversity also consumed dark green leafy vegetables, such as sweet potato or cassava leaves. Overall, cereals, fish, oils and fats and other vegetables were the most consumed food groups (by 72,0% of the children). The consumption of vitamin A-rich foods and eggs was very low (less than 5%).

Table 1: Major food groups consumed by children aged 24 to 59 months in Domè-Sèko, Benin, per category of dietary diversity

[Principaux groupes alimentaires consommés par les enfants de 24 à 59 mois à Domè-Sèko, Bénin, par catégorie de diversité alimentaire]

	Low dietary diversity (DDS \leq 3)	Average dietary diversity (3 < DDS \leq 5)	High dietary diversity (DDS > 5)
Food groups	Cereals	Cereals	Cereals
	Oils and fats	Oils and fats	Oils and fats
	Others fruits		Other fruits
		Fish	Fish
		Legumes	Legumes
		Others vegetables	Others vegetables
			Vegetables with dark green leaves

Mothers' dietary diversity score was relatively low and similar to that of children aged 24 to 59 months. Their mean dietary diversity score was 5 ± 1 food groups, and the median 5, with a minimum of 3 and a maximum of 9 food groups respectively. Most consumed food groups by mothers were cereals, oils, fats and other vegetables (mainly tomatoes and onions). Vitamin A-rich fruits, meat and offal, eggs, milk and dairy products were poorly consumed by mothers (less than 2%). Among mothers, 11,3% have low dietary diversity, 50% average diversity and 39% high dietary diversity. Mothers with the least diversified diet only consumed cereals, oils, fats and other vegetables poor in vitamin A. Those with average dietary diversity consume more fish, an important source of proteins. Mothers with the most diversified diet consumed legumes, dark green leafy vegetables, white tubers (cassava, plantain, yam) and other fruits (pineapple, banana, orange, lemon), besides food groups consumed by the other two categories.

3.3. Household food insecurity

The majority of households (80%) were food insecure, including more than half of the households in severe food insecurity (53%). The average HFIAS score was 9/27 [0-27/27]. Most vulnerable households face all three domains of food insecurity (anxiety and uncertainty about food supplies in the household, inadequate

food quality and inadequate food intake) and its physical consequences.

The linear regression tests performed on the variables studied showed that in the children, the dietary diversity score was significantly associated with the weight-for-age (p-value < 0,001), the height-for-age (p-value < 0,001) and the weight-for-height indices (p-value = 0.002). The higher the dietary diversity score, the better the nutritional status of the children. There was no significant relation between mothers' BMI and DDS (p-value = 0.110). The linearity test between mothers' dietary diversity and children's dietary diversity was significant (p-value = 0.003). Thus, children with a high DDS also had mothers with a high DDS. There was no significant association between the level of household food insecurity and the nutritional status of mothers and children (p > 0,05). However, 67% of women with chronic energy deficiency lived in food insecure households.

3.4. Community perceptions of access to food and dietary diversification in relation to under-nutrition

The poor dietary diversification of mothers and children, reflected by the dietary diversity indicators, was corroborated by most participants. In addition, women were highly aware food monotony causes malnutrition and group discussions with them provided insights into

the importance of a diversified diet for a good nutritional status.

« *Food monotony is the cause of this disease [malnutrition]. You can often give food to your child and yet after weighing you will be told that he has a low weight. All foods are not the same, for example if you take your palm kernel juice to which you add moringa [Moringa oleifera] leaves, chilli, cube [seasoning], soybean cheese, onion, if you try to feed your child with such food, he quickly gains weight.* » a woman of childbearing age (15 to 49 years) said.

Mothers struggle to have a sufficient and diversified diet themselves. Women in the 15-49 years age group stressed this unmet need for food is not only due to poor food access but also to lack of time to eat, because of the burden of countless household chores on women. One of them pointed out: «... *because you work all the time and you cannot eat on time, even though the food is available [at home], you can be malnourished.* » another one added.

However, while some explained this suboptimal diet by the low availability of food at household level and the level of occupancy of women, others in the group of older women said the root cause was poverty, that is, lack of financial resources.

3.5. Community perceptions of other risk factors of undernutrition

3.5.1. Water, hygiene and sanitation

Access to potable water was a real headache for the population of Domè-Sèko. They were unanimous about the existence of only one water fountain in the village while hamlets are very distant from one another. Besides access to water, the focus group participants acknowledged poor environmental hygiene, absence of latrines and open-air defecation although they were aware of the importance of good hygiene in their daily lives.

« *Here, it is in the bush that we defecate.* » an active man (18 to 65 years) said.

This was unanimously shared by men and women, and showed that good hygiene is a problem in the study area. However, according to a woman of childbearing age (15-49 years old), the hygiene issue was not a behavioural one but was due to a lack of resources. She confided:

« *It's not because we do not need latrines, but we cannot afford them.* »

While women explained the absence of latrines by a lack of financial means, men added it was risky to have latrines built when lacking money. According to them, it is better not to have latrines if there are not enough financial resources to build solid ones with good material.

A senior men (older than 65 years) explained:

«... *what we build of our own strength could become what would kill us later* ».

In other words: « *if we do not have enough [financial] means, we prefer not to have these [latrines] because if the slab is not solid, it can collapse at any time* », another one added.

3.5.2. Utilization of health services

In addition to suboptimal environmental hygiene, access of the population to health care and services was far from being satisfied. The closest health centre to the village was 4 km away, according to the interviewees. Moreover, several women highlighted hospital reception was not friendly and impeded their willingness to attend the health centre. A woman of childbearing age (15 to 49 years) entrusted us during the focus groups:

« *Health workers welcome you badly, insult you. At [...] for example, if you're going for a problem, you're asked to sweep the premises first. The midwife at the health centre told me: it's enough for someone to give you 1 kilo of rice for you to get pregnant of this person [who gave you this]* ».

3.5.3. Sociocultural risk factors

People from Domè-Sèko were still attached to some ancestral beliefs that go against optimal nutritional status of women and children, like food taboos. For example, cheese was still prohibited to pregnant women, and voandzou (*Vigna subterranea*) to children and adults in general. Participants in the older women group added raising animals like sheep was forbidden. It also emerged from the group discussions that traditional medicine had a prominent place in the population lifestyle. Herbal infusions were used almost everywhere and in any circumstance, during pregnancy, for newborns, during breastfeeding or in case of illness. They were often used well before going to the health centre as a woman of childbearing age told. Religious beliefs were not left behind when treating diseases in Domè-Sèko. According to the participants, some diseases should not to be treated in health centres and it is even dangerous to do so. An old women (above 65 years of age) explained some diseases are caused by witchcraft.

3.5.4. Women's empowerment

In Domè-Sèko, child feeding (including financial means for that) is often the responsibility of mothers, according to women interviewed.

« *We contribute enough and much more than our husbands even if the husband gets up in the morning, he goes to the field and we take care of everything at home [housekeeping, meals, taking care of the children].* » (Woman of childbearing age (15-49 years).

« *There are husbands who are not well in their head, even the food they do not give at home.* » another one said.

This idea was somewhat confirmed by men.

« *Those who have an economic activity do not always wait for men to feed their children.* » an active man (18 to 65 years) said.

Consequently, women's level of empowerment would have a real impact on children's nutritional status. Women often engage in small income-generating activities, such as small business, small-scale farming and *gari* (cassava semolina) processing. However, according to them, these activities do not provide them with sufficient profit to cover their families' food expenses.

Other factors related to women's empowerment were identified: women's workload and too close pregnancies. According to the grandmothers (old women, above 65 years), women are victims of too close child deliveries as they seem to have no idea about existing planning methods. During the discussions, a woman of childbearing age (15 to 49 years) confirmed:

« *Close pregnancies are not a good thing but a bad thing because sometimes you don't expect that and you fortuitously get pregnant, so if we could know what to do in the belly so that we stop falling all the time pregnant, it would be good.* »

Although the concept of malnutrition was well understood by a large part of the population, some mothers were still unaware of its causes and manifestations. They simply assimilated it to the presence of worms in children's organism or admitted they do not know the causes.

4. Discussion

The present study aims at investigating community perceptions of two potential risk factors of undernutrition in children and their mothers in the district of Zè in Benin, namely household food insecurity and individ-

ual dietary diversity. The study confirmed undernutrition among the children was partly due to a poorly diversified diet, as the computed child anthropometric indices correlated with the dietary diversity score.

Among the children, stunting was the most common type of malnutrition, which is confirmed by nationwide surveys (INSAE 2015 ; INSAE & ICF 2018). The prevalence of stunting obtained was high (57%) and close to what was reported in children aged 18 to 36 months (52%) in the rural district of Bopa in the Mono region of Benin (Djossinou 2005). A high prevalence of stunting (49%) was also reported in 6 to 23 months old children in a slum area in the city of Nairobi, Kenya (Mutisya et al. 2015). The level of dietary diversity of both children aged 6 to 23 months and 24 to 59 months was low. Their diet consisted mainly of cereals, roots and tubers, and lacked sources of proteins and vitamin A-rich foods. As the study was conducted during the lean season (September), the variety of food in the households was probably very limited. Children's and mothers' dietary diversity correlated, probably because the children and their mothers had access to the same types of food available in the households.

Hence, our results support that better dietary diversification yields better nutritional status in children; but in mothers, there was no relationship. Other studies also found a positive link between dietary diversity and children's nutritional status, in the Philippines (Kennedy et al. 2007), Bangladesh (Zongrone et al. 2012), Burkina Faso (Masson 2007) and Kenya (Onyango 1998). The dietary diversity score used to evaluate dietary diversification in this study is known to adequately predict dietary quality (Hatløy et al. 1998 ; Tarini et al. 1999 ; Arvaniti & Panagiotakos 2008), which is a determinant of nutritional status (UNICEF 1998).

The prevalence of food insecurity in Domè-Sèko was high (80%) and close to the prevalence in Chad, in the more arid Sahelian and Sudanian zones, with 79% of rural households affected (MAI et al. 2013). It is more alarming than those reported in Senegal with 52% of households affected (Keita 2008), in the Littoral of Madagascar, 39% (WFP 2007), and in Mali with 25% of rural households in food insecurity (WFP 2006). However, the high level of household food insecurity (80%) did not explain the high prevalence of undernutrition among the children and the existence of chronic energy deficiency among their mothers (9%). This is probably because food insecurity was assessed using the HFIAS which describes household food access based on self-reported experiences (Lele et al. 2016) and does not capture quantitative dimensions of household food insecurity, like quantities of food available. However, in a recent study in Indonesia, HFIAS categories correlated significantly with child stunting in an urban area (Mahmudiono et al. 2018).

The study also aimed at getting an insight into other key context-specific risk factors. Beyond quantitative

data, community perceptions revealed additional causes of maternal and child undernutrition in the study area. Many sociocultural factors were highlighted. A major one to consider for interventional purposes is the low contribution of men in household food supply in a context where women have lower incomes. This reality should be highlighted during community behavioural change activities. Another important aspect is low utilization of health facilities because of a non-friendly reception by the staff but also due to the wide use of traditional medicine at various occasions. It appears better for public health authorities to opt for greater recognition of the societal role of traditional medicine, formalization of the profession of traditional healers and their active implication in the management of childhood diseases, as well as maternal illness and pregnancies, to prevent undernutrition. The villagers additionally highlighted household chores as a risk factor of maternal undernutrition, with lack of time to eat sufficient food as a consequence. Women's workload, including housework, was also reported to cause undernutrition in a village in Maharashtra, India (Chorghade et al. 2006).

Focus group participants also mentioned poverty and its negative influence on household food availability, dietary diversification and children and mothers' nutritional status. No nutritional intervention could succeed in the long run without alleviating this key problem. Thus, to reinforce direct nutrition activities, nutrition sensitive interventions are recommended (Ruel et al. 2013). Women empowerment initiatives fit well within this category and cash transfers to mothers are an effective example of these. Cash transfers are proven to improve household food security (Bhalla et al. 2018, Mary et al. 2018) and children's diet (Na et al. 2015) by increasing mothers' financial capacity for household food supply, especially during the lean season which is when our study was conducted.

Some mothers in the focus groups were not aware of malnutrition and its risk factors and manifestations. It is clear that if malnutrition and its causes are not well understood at the grassroots level, it would be impossible to help people adopt nutrition-friendly and health promoting behaviour. Nutrition sensitive interventions also need to include sensitization on good nutritional practices, not only for mothers but also other community members, such as fathers, grandmothers and public service health and agricultural agents.

5. Conclusion

This study provides a basis for the refinement of intervention strategies to alleviate undernutrition in the district of Zè, Benin. However, given the fact that it was

carried out only during the lean season, a full picture of what happens all year long might have been overlooked. For instance, dietary diversity scores of the children and their mothers may be higher in the abundance season than in the lean season when the study was conducted. Longitudinal appraisal of the diet of child-mother pairs in the study area would complement the results obtained here. Although the qualitative approach used does not allow for generalization of the results, it gives a deep insight into the risk factors of maternal and child undernutrition in the study area, which provides useful investigation tracks for programmatic purposes, not only in the study area but also in similar settings.

CONFLICT OF INTEREST

The authors did not declare any conflict of interest.

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