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The Question of Infant Feeding in Rural Areas of Koro (North Cote D'Ivoire): A Community Solution Perspective

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ABSTRACT: Infant feeding is a real child health problem in Côte d'Ivoire. This situation led to the initiation of a participatory community health approach in the rural area of Koro. It is a qualitative type of research in which Koro community was the target group. The research is categorized into three phases: social mobilization, community diagnosis, and the restitution workshop. With this, the priority problems of infant feeding in the community were identified as well as their solutions, and then an action plan was proposed for healthy infant feeding. The priority problems include the following: the rejection of colostrum, non-observance of exclusive breastfeeding, the inappropriate introduction of complementary foods, the

burden of fieldwork demand on mothers, and early stopping of breastfeeding. From the responses obtained, the priority solutions considered include: educating the mothers of the community to change their perception about colostrum, and supporting mothers in the process of dietary diversification and stopping breastfeeding. To this end, an implementation action plan based on a dynamic and community collaboration framework was established to improve infant feeding. It appears relevant as a health monitoring support for the rural community of Koro.

Keywords: Food, infant, child health, community intervention, Ivory Coast

INTRODUCTION

Infant feeding is a main concern of infant health. At this stage of early childhood thinness and stunted growth are prevalent (Briend, 2009), especially as it is evident that there is a high prevalence of malnutrition in the first year of life in children across the world (WHO, 2020).

However, several factors can lead to a child's nutritional vulnerability, which are established based on a few benchmarks. They are seen from breastfeeding in newborns to food diversification in young children. These include depriving newborns of colostrum (Oumarou, 2013; Bureau-Point *et al.* 2017; Tariq *et al.* 2019; Kibora and Zerbo, 2020), socio-cultural and economic barriers linked to exclusive breastfeeding (Traoré *et al.* 2014; Otmani *et al.* 2015; Diagana and Kane, 2016; Sidibé *et al.* 2018; Somé *et al.* 2020) and inappropriate dietary diversification (Brou-tanoh *et al.*, 2010; Yuan *et al.*, 2016; Kouassi and Ehui, 2018; Maillier *et al.*, 2019).

However, an optimal diet would reduce the risks of morbidity and mortality in children and also contribute to their growth and development (WHO, 2018a). It is therefore right that several international organizations are involved in the fight against malnutrition, such as WHO, UNICEF, FAO, etc. Along with the United Nations system, it should be noted that WHO made more than 21 resolutions from 1980 to 2018 in support of infant nutrition, appropriate feeding patterns and other related issues (WHO, 2018b). Also, the United Nations General Assembly has adopted resolutions in this direction, such as WHA68.19 (2015), WHA69.8 (2016) and Resolution 70/1 (2015). These various resolutions have contributed to the definition of SDG 2 to improve child nutrition (WHO, 2017). Alongside this, the intervention perspective of these international organizations is geared towards actions that support exclusive breastfeeding and

complementary infant feeding among vulnerable populations around the world.

Like other countries around the world, Côte d'Ivoire is committed through its health policy to make child nutrition a priority. The country joined the Scaling Up Nutrition movement in June 2013, to reaffirm its commitment to good nutrition for its population. A decree formalizing the multisectoral platform as a national nutrition council attached to the prime minister was issued in July 2014. The council adopted a new nutrition policy operationalized through the national multisectoral nutrition plan (PNMN) 2016- 2020. Decree No. 2013-416 of 6 June 2013 regulating the marketing of breastmilk substitutes was also issued to help promote and protect breastfeeding (MSHP, 2016a).

Despite all these initiatives, it is known in Côte d'Ivoire that under-nutrition contributes directly or indirectly to high infant, child and maternal mortality (MSHP, 2016b). In fact, the national incidence of acute malnutrition in children under 5 fell from 12.4 % in 2016 to 11.4 % in 2017, a drop of 8.1%. More than three quarters of acutely malnourished children screened (89.4%) were taken care of in health centers across the country. The highest incidences of malnutrition in children under 5 years old were observed in the health regions of Tonkpi (37.3%), Poro-Tchologo-Bagoué (33.5%) and Kabadougou-Bafing-Folon (32.8%) (MSHP, 2018).

In Poro-Tchologo-Bagoué Health Region, Boundiali Health District is not exempted from the sad reality of the problems of infant feeding. The phenomenon is accentuated with a declared number of 410 cases in 2018. A part Boundiali Health District, the rural health area of Koro recorded 20 cases of malnourished children with an estimated 110 cases of live births for the same year, after the 2018 activity report of the said health district. Thus, during the pre-survey, it was noted that there were differences in the local practices of the community in terms of exclusive breastfeeding, food diversification, weaning of infants and conceptions of modern medicine.

These realities reveal the complex nature of infant feeding. These local practices reflect risky eating behaviors, which can be linked to a high level of infant malnutrition. This has led to the following questions: How can the burden of malnutrition encountered in this rural town of Koro be reduced? How can we get the vast majority of the population of the community to provide infants with optimal nutrition and sustainable health at a lower cost?

To answer these questions, we suggest that the relevant hypothesis suitable for viable health in terms of nutrition for all Koro infants is the establishment of a health promotion system anchored on lifestyle habits. This is to guide the different social layers of the population of Koro towards adopting eating behaviors that are good for the general well-being of their infants. From this theoretical position, the community has to take

the responsibility to participate fully in all the stages of the research and should be committed to finding solutions that are more suitable to its socio-cultural, economic and health environment (Demange *et al.*, 2012). In this context, the community participatory approach is relevant for a better understanding of the problems related to infant feeding and of the relevance of their solutions involving the participation of the populations of Koro. This article aims to make a community diagnosis and plan implementation actions for the control and improvement of infant feeding and infants' health in the rural areas of Koro. This orientation requires a particular approach in conducting the study.

MATERIALS AND METHODS

The intervention area is located in Bagoué Region in the North of Côte d'Ivoire. This region together with Poro and Tchologo regions forms the Savanes District. It is bounded on the east by Poro Region, on the west by Kabadougou and Folon regions, on the south by Béré and Worodougou regions and on the north by the Republic of Mali. Its capital is Boundiali and includes three (3) departments: Boundiali, Kouto and Tengrela. It has an estimated population of 375,687 (INS, 2015). According to this same source, Koro Village, located in the sub-prefecture of Kolia in Kouto Department, is the survey site selected with an estimated population of 1,489 among which there are 479 children aged 0 to 5.

This study is part of a community health context. The community intervention started from December 16 to 22, 2019 in the village of Koro. Community participatory approach was used, in which the construction of social reality with the actors depends on individuals and groups defining their environment by their thinking and actions, which are guided by their goals (Dorvil and Mayer, 2001). The even development of infants in the village of Koro is slow due to lack of food. This is a critical situation which the populations of the village are aware of. This awareness raises facilitated community mobilization around this issue, the engagement of community members in the decision-making process, identification of problems, solutions and in planning of activities, including the monitoring plan and devaluation.

The target groups of the survey were mainly village women. Three categories of women were chosen. The first category of women had at most one child. This category was chosen because they are considered as new mothers who possibly lack experience in caring for a baby. This social category was used in order to have information about breastfeeding behavior in Koro. The second category was women with at least two children. They were chosen because it is assumed that they have experience in caring for infants. This can make it possible to specify the practices in terms of food supplements for infants in Koro. The third category women aged 50

to 75 who had reached the stage of menopause. Women of this status are considered to be the guarantors of tradition. These were involved in the study in order to obtain facts based on the cultural benchmarks in infant feeding and to indicate the factors and modalities of change in this direction. The ethical aspects of research were considered in this study. The participants were informed about the research topic, its objectives and methods. Likewise, they were enlightened about their role in the study. That means they gave their consent to participate in this research. The ethical principles of anonymity, confidentiality and the right of withdrawal were followed for all the participants. Several techniques and data collection tools were used to conduct the survey. The triad-type group interviews were conducted with the three categories of women. This technique is used to carry out a homogeneous group interview comprising three (03) participants (Konate and Sidibe, 2006). In this work, it was a question of highlighting the position most shared by the community in relation to the practices of infant feeding. The aspects developed in the group interview guide included dimensions relating to the three phases of infant feeding: exclusive breastfeeding, the introduction of solid foods and stopping of breastfeeding. Subsequently, the seasonal calendar was used to know the occupation time and periods of the village people as well as the time they would be available for the study. The time to meet the community for certain actions was well programmed. The data collected in audio format in the field was first transcribed using the Word software of the Microsoft 2016 office pack. Then, the transcribed data were recorded in the Nvivo 12 software for analysis. What was analyzed is the triad interview carried out with the three categories of women using the content analysis and comparative methods. The constructivist approach was used to obtain the meaning of the data in order to initiate a local dynamics (Bantuelle *et al.*, 2000). For this, it was important to highlight the problems, solutions and implementation actions related to infant feeding in the rural community of Koro in order to obtain the desired change in infant feeding in this rural setting.

RESULTS AND DISCUSSION

Community issues related to infant feeding in Koro

Community issues related to infant feeding in Koro are based on the perceived image of colostrum, non-compliance with exclusive breastfeeding, inappropriate introduction of complementary foods, heavy work demands on the rural women and stopping breastfeeding.

Perceived image of colostrum

Colostrum was offered to the nursing mothers as the

primary resource for breastfeeding their newborns. However, this fluid secreted by the mammary gland after childbirth was perceived as bad milk in the community of Koro, as one participant put it:

"It is water; it is not good milk. That is, after it good milk comes out. It is also a mixture of sweat and water; it is dirty, and that is why we do not give it to our children at birth" (A mother of at least 2 children).

This definition of colostrum by the community has led to the use of certain practices to feed newborns in these first hours of life. On that note, one participant said:

"I cannot give my baby the first milk. In order for the baby not to be thirsty and hungry, I give him tea or water before the good milk comes" (Mother of at least 2 children).

It is indisputable that in the community of Koro, colostrum was rejected by the women surveyed. According to them, this was beneficial to preserve the health of their newborns. Kibora and Zerbo (2020) also observed that newborns are deprived of colostrum among different ethnic groups in Burkina Faso. These groups viewed the first milk as poison to the point that other means were used to keep their babies from going hungry. Such attitudes directly contribute to feeding failure in infants. One of them is non-compliance with exclusive breastfeeding.

Non-compliance with exclusive breastfeeding

Exclusive breastfeeding is not fully followed in the Koro community. In this rural location, mothers give water to their children from birth under the influence of their mothers and grandmothers, as one participant revealed:

"Our mothers and grandmothers influence us and tell us to give our babies water and herbal teas. And this usually happens when we bath the babies. As soon as they begin to sit up, we give them some water. We also give them water regularly to make them less thirsty when the weather is hot" (Mother of at most 1 child).

This mixed diet consisting of breast milk, water and herbal teas given to infants has been mentioned by Kouassi and Ehui (2018). In fact, to them, water is essential in human life generally, and decoctions are good. This justifies this mixed feeding of infants in the ethnocultural group in Côte d'Ivoire. It is clear that it is very risky to feed infants with water and herbal teas in Koro since they fill the bellies of the infants and prevent them from drinking with appetite their mothers' milk which contains antibodies and growth hormones.

Equally worrying is the inappropriate introduction of complementary foods.

Inappropriate introduction of complementary foods

The introduction of complementary foods is not based on the standard set in the community of Koro. It does not start after the first six months of exclusive breastfeeding of infants as recommended by WHO. In this population, several mothers do not follow the standard set by WHO because they introduce solid foods into their infants' diet between the third and fifth month of their birth. One participant testified to this:

"From three or five months, the babies cry too much because the breast milk can no longer hold them. It is porridge that calms them and makes them feel full. This makes them to sleep well without any problem" (Mother of at most 1 child).

However, some women in Koro community do not use porridge as the first complementary food for their babies, as one participant illustrated:

"I used adult food immediately because my child could eat what I eat, that is, foutou rice, meat, and fish with sauce, etc " (Mother of at most 1 child).

Referring to the introduction of complementary foods, Mavuta *et al.* (2018) noted that mothers in an urban community in the city of Lubumbashi, Democratic Republic of Congo had poor knowledge and practices of infant feeding, as well as poor attitudes towards it in respect to WHO recommendations. They see this situation as gloomy. In the context of Koro, this intake of solid food after the first three or five months of exclusive breastfeeding would put the child at risk of abdominal bloating and malnutrition due to poor digestion. This precarious situation of infant feeding is further complicated by the weight of field labor on mothers.

Weight of the requirement of field work

The contribution of the women of Koro to field work appears to be an unfavorable factor in infant feeding. In fact, mothers are forced to feed their newborns intensely with porridge in order for them to have as much time as possible to involve in rural activities, as evidenced by the words of one participant:

"The babies are breast-fed and given corn porridge in the morning before we go to the field. When they cry in the field, we give them corn porridge that has been prepared at home in the morning. This quickly satisfies them, not the breast milk. We do this because we work and do not have time to sit and give them breast. We give them

more breast milk at home in the night "(Mother of at least 2 children).

The role of Koro mothers in the field work is without doubt important. This makes them not to comply with either the requirements of exclusive breastfeeding or complementary foods in infants. In this context, Ben Slama *et al.* (2010) justify this attitude as the mothers do not have time for exclusive breastfeeding. As a result, the infants are more likely to suffer from improper feeding. Amino *et al.* (2015) pointed out in this regard that the energy density and the content of essential nutrients are too low in local flours. According to them, the nutritional value of the porridge was not sufficient to supplement the energy and nutrient intake contained in breast milk. The early introduction of flour porridge does not play a significant role in the transition to solid foods. From this point of view, Tshite and Ndiababo, (2015) observed a significant decrease in protein content, especially with flour prepared by wet process. Incidentally, stopping breastfeeding also raises awareness about infant feeding.

Stopping breastfeeding

In the community of Koro, the discomfort of mothers before the children get to 2 years old leads to the early weaning of their children, which is not in line with WHO standards. One participant highlighted in this regard that:

"Around a year and five months, my children practically have their complete teeth. I cannot sleep at night because I nurse them. So, I inform my husband that I am going to stop breastfeeding them. I put something bitter on the tips of my breasts to disgust them from sucking my breasts. These are most often the leaves of certain plants that taste bitter "(Mother of at least 2 children).

Rabevazaha *et al.* (2019) showed that early return of mothers to work and the desire to diversify their infants' diet early contributed to stopping breastfeeding. They linked this attitude to both the low educational and socio-economic levels of the parents. These explanations applied to the community of Koro as their quality of rural life is far from being met. This is the rationale behind some of the practices of the mothers of the community, for their children to stop taking breast milk early, according to one participant:

"When I wanted to stop breastfeeding my baby, I gave him cow's milk sold in the shop here. Often, it was my husband who told me to give him bread and coffee with milk or even biscuit" (Mother of at least 2 children).

From this perspective, Chiabi *et al.* (2020) argued that the young age of mothers fewer than 20 and their low level of education were factors influencing poor dietary

diversification in infants. These various attitudes and practices reveal the complex nature of infant feeding with evidently dramatic consequences on their health. From these problems facing infant feeding in the community, solutions were identified based on the ability of the community to achieve them.

Identification of solutions for healthy infant feeding

Community restitution ordered the following solutions: educating the mothers of the village to change their perceived image of colostrum, supporting mothers in the process of dietary diversification and stopping their babies' breastfeeding.

Educating mothers to change their perceived image of colostrum

The community of Koro found it necessary to hold an education program to change the perceived image of colostrum in favor of local women and men. This activity should focus on colostrum and centre on its composition, importance, benefits for mothers and their newborns, as well as the benefits of exclusive breastfeeding during the first six months of the life of the infants.

Supporting mothers in the process of food diversification

The community of Koro has agreed to support mothers in the process of food diversification. This activity should focus on the variety of complementary foods, their advantage, the timing of their introduction into infant feeding, as well as local flours and their preparation and storage.

Supporting mothers in the process of stopping breastfeeding

The community of Koro has agreed to support mothers in the process of stopping breastfeeding. This activity requires that the village people should be educated on the negotiation process, appropriate attitudes and practices for a smoother transition to a breastmilk-free infant feeding regime. From this formulation of the solutions, the ability of Koro community to apply them becomes the next thing to be considered.

Distribution of activities

The issue is of a methodological nature. It is a matter of clearly and precisely defining the resources necessary to achieve the solutions. As part of this community approach, the operationalization of activities requires the training of teams and committee of elders, as well as the distribution of roles and tasks.

Training of intervention teams and the committee of wise men

As the village is divided into three districts, three teams were formed. A team represented a neighborhood in order to carry out the activities. The training of the different teams was done with individuals from these neighborhoods. Each team consisted of three individuals, including two women and one man. One of the selection criteria for women was for them to be mothers of children. At the end of the procedure, a woman with more than two children and a woman considered to be a grandmother in the village were detained. Respect for elders and experience in child up bringing were given priority in the selection of women. Among men, only those who can read and write were selected. Thus, each district had a team formed by the assembly of community members present. In addition, a committee of wise men was set up to facilitate activities in the village. Their support for the project was helpful in the development of activities. The designation of members was made on the basis of influential people in the village such as the village chief, the land chief, the women's president, youth president, president of the health center management committee, and the chief from a large family. The activities of the different teams involved training their members on how to educate mothers to change their perceived image of colostrum, and support mothers in the process of food diversification and stopping breastfeeding. This training was entrusted to the manager of the rural health center in Koro. Following the establishment of the intervention teams and the committee of wise men, the different roles of the stakeholders was distributed among them .

The distribution of roles

With regard to the teams trained, the role of adviser was devolved to the women in order to support the mothers targeted by the project in adopting new attitudes towards and practices of infant feeding. The men were asked to decorate the secretariats and keep notebooks and registers. The members of the committee of wise men were assigned the role of facilitator to promote the mobilization and participation of members of the Koro community in the project. The head of the rural health center in Koro was appointed as the coordinator of all the implementation activities.

The division of labor

The tasks assigned to each response team were divided according to their identified roles. The work of the counselors was to talk to pregnant women and those who newly gave birth on the composition, importance and advantages of donating colostrum to mothers and their newborn babies and more particularly on immediate

breastfeeding of their children afterbirth. They are to promote exclusive breastfeeding for up to six months and train nursing mothers on how to prepare improved porridge for their children. Finally, they will have to teach the mothers food hygiene in order to preserve the health of their children. The secretaries will be responsible for listing pregnant women and mothers with a child under two years old. They will also have to keep the follow-up register of women during the phases of exclusive breastfeeding, food diversification and stopping breastfeeding, then report on the weekly activities of the teams in the Koro community.

The committee of elders will be responsible for facilitating the implementation of the project through the mobilization and participation of members of the Koro community. Likewise, this committee will support the three teams in their activities in the village and, if necessary, plead with men and women who are resistant to the project. The project coordinator will be responsible for training the three intervention teams on how to educate mothers to change their perceived image of colostrum, and support mothers in the process of dietary diversification and stopping breast-feeding. More specifically, he will educate the intervention teams on the benefits of colostrum, exclusive breastfeeding for up to six months, and introduction of complementary foods from six months and preparation of improved porridge. Also, he will have to develop the activities of the different intervention teams in the households and establish their weekly program of activities. Finally, he will have to organize meetings with the various intervention teams of the Koro community. All in all, the monitoring and evaluation procedures must be explicitly described.

Definition of monitoring and evaluation methods

The implementation of the project in time and space requires monitoring and evaluation methods in this context of community actions related to infant feeding in the town of Koro.

Definition of monitoring methods

The various activities relating to infant feeding in Koro community are monitored by the secretaries of the intervention teams. Indeed, they will have to keep three registers in order to follow their activities. First, the secretaries will take a census of pregnant women and mothers with children up to two years old. All these data will be noted in a register dedicated for this purpose. Then, the secretaries will write the reports of the various activities carried out with women in the village of Koro. Finally, the secretaries will have to keep a third register for classification of women according to the stages of infant feeding such as exclusive breastfeeding, dietary

diversification and stopping breastfeeding. Finally, the secretaries will produce standing meeting reports for better project management.

Definition of evaluation methods

The evaluation of the activity effectiveness process will revolve around two major points in the community of Koro. It entails evaluating the levels of effects the community actions which include changing of the perceived image of colostrum, and supporting mothers in the process of food diversification and stopping breastfeeding have on infant feeding. In this one-off activity, the intervention teams will need to find out at what level colostrum is given to newborns, the complementary foods that are appropriate and the stage at which stopping breastfeeding is less traumatic. This will aid in decision making through recommendations for the development and improvement of infant feeding. To achieve a good result, this approach is chosen above all, considering the strengths and weaknesses of the process of promoting infant feeding in the community of Koro.

Critically examining the infant feeding promotion process

The strengths of the infant feeding promotional process are discovered through the involvement and participation of Koro community members and the awareness of the impact of local actions.

The community approach to infant feeding in Koro relies on the involvement and participation of the vast majority of the inhabitants of the village. Community mobilization around the issue of infant feeding was accepted by all stakeholders including local authorities. Moreover, during the community feedback, spontaneous community support for the implementation of the project was observed.

This resulted in the assembly giving an order for the activities of the project to start the following day. In addition, being aware of the impact of local actions gives an opportunity for the community of Koro, as their perceptions about infant feeding as well as their unsafe practices were exposed during the community restitution. The consequences of these practices, especially in children were discussed.

From the discussions, the participants understood that a good monitoring of infant feeding has merits which include the development of infants' growth and their health. However, there are some weaknesses observed in this infant feeding promotion process. The young men of Koro community were not interested in community intervention activities. This implies that only a part of the community members was involved in the development of promotional activities.

Lessons learned from the infant feeding promotion process

The development of community actions relating to infant feeding is essentially based on Koro community itself, that is, the community was fully involved under the control of the facilitators. The search for local solutions shows that the community of Koro is able to solve the problems related to infant feeding within them. The solutions are based on preventive action. It has to do with preventing problems by correcting perceptions and risky practices. Consequently, this initiative enables the empowerment of the community by helping it understand the explanatory factors and local means to be mobilized to respond to the problems of infant feeding. Furthermore, the implementation of community actions on infant feeding in Koro has shown that it does not need a large budget. The essential elements require for the success of these actions entail creating awareness about the problems of malnourished cases and community mobilization. Indeed, these two elements go hand in hand and it is essential to arouse their effectiveness in all the members of the community of Koro.

Conclusion

This research has shown the relevance of the community health approach applied to problems related to infant feeding in the rural area of Koro. From resorting to community diagnosis, priority problems were identified, in particular the rejection of colostrum by mothers, non-observance of exclusive breastfeeding, inappropriate introduction of complementary foods, the weight of field work on mothers and early stopping of breastfeeding. From these facts, priority solutions such as educating mothers to change their perceived image of colostrums, and supporting mothers in the process of dietary diversification and stopping breastfeeding were considered. Subsequently, a community action plan was developed based on the involvement and dynamics of the populations of Koro. In this rural environment, it is the real problems of infant feeding that gave rise to the appropriate actions that can be defined and carried out over time for quality infant feeding at lower risk. This requires the civic engagement of each member of the community to apply governance methods and address the challenges of infant feeding in a community health process.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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