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# Approaches to Assessing Context and Culture in International Nutrition Education Programs

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***Abstract:*** *The purpose of this paper is to explore how context and culture affected the nutrient intakes and complementary feeding (process of feeding solid foods in addition to breast milk) practices of 6 to 12 month old infants in sub-Saharan Africa to generate appropriate nutrition education approaches.*

## Introduction

Child undernutrition remains a problem throughout the developing world. Undernutrition leads to stunting, poor cognitive development, and morbidity and is responsible for 35% of child deaths under the age of 5 (Black, et al., 2008). Undernutrition is frequently caused by inadequate nutrient intakes and disease resulting from poor complementary feeding behaviors/practices. This complementary feeding period is therefore recognized as a critical time for intervention to prevent child undernutrition (Victora, de Onis, Hallal, Blossner, & Shrimpton, 2010).

The role of context has been long recognized in discussions of child undernutrition, and elements of context are included as underlying and basic causes in the widely accepted UNICEF framework for child undernutrition (Black, et al., 2008). Context is a difficult word to define. In simple terms, context is the set of circumstances surrounding something. Its definition may be narrow and confined to immediate people and surroundings, or it may be expanded to include characteristics of the society, culture, physical environment, economy, and political system. Currently the recommended complementary feeding interventions, including nutrition education programs, target the most immediate causes of undernutrition—inadequate nutrient intake and complementary feeding practices—as opposed to other contextual aspects. This focus is understandable given the complex layers of context that might be relevant, and the drive to simplify and generalize global recommendations. Previous nutrition education interventions have produced limited and variable effects on child growth. Given that current recommendations for future interventions are based on two broad contexts—food secure areas and food insecure areas, the purpose of this study was to compare two food insecure contexts to understand how other contextual aspects might affect the generation of appropriate nutrition education approaches.

## Methods

The research was completed in Pemba Island, Zanzibar, Tanzania and rural central Zimbabwe as part of the feasibility studies for larger interventions. Sites in each setting were purposively chosen. In Pemba the research took place in 3 villages—1 semi-urban village in the district of Wete and 2 rural villages in the district of Micheweni (1 inland and 1 coastal) during January 2006 and January 2009. In Zimbabwe the research took place in 2 small rural villages in the central district of Chirumanzu between November 2007 and April 2008. Mother and infant dyads were randomly selected from lists of eligible households provided by village health

workers, health clinics, or other community leaders. Eligible mothers had infants between 6 to 12 months of age and were breastfeeding. To assess nutrient intakes, two interviews called 24 hour dietary recalls were conducted where mothers detailed all of the foods and drinks consumed by the infant on the previous day. (Pemba, n=44 children and Zimbabwe, n=32 children). Information about complementary feeding practices (e.g. meal frequency, food preparation, and feeding modes) was collected in two ways. In Pemba, focus group discussions were conducted initially (n=72 mothers) in 2006. In Zimbabwe, information about complementary feeding practices was collected using in-depth household interviews (n=32) in 2007-2008. To capture information sought in the household interviews that was not discussed in the focus groups, the same interviews were conducted in Pemba (n=36) in 2009.

## Results

Complementary feeding problems and their contextual determinants Zimbabwe. The major nutrient gaps were protein, vitamin A, folate, iron, and zinc because mothers were not feeding any animal source foods, legumes, fruits, or vegetables. While food insecurity (household and local) contributed to this behavior, the primary reason that mothers behaved this way was an indigenous beliefs that children cannot consume those foods. Mothers were hesitant to feed vegetables, meat, hard cereals, some beans, traditional insects, and hard fruits because of the worry that the baby “can’t chew them; the baby may choke.” The local community teaches mothers that children can only consume these foods when they develop teeth for chewing. There is a lack of knowledge around processing foods such that children can swallow them before they develop teeth. There was also an energy gap because children were consuming foods with a low energy density (i.e. calories/100 g food). The low energy density was due in part to the household and local food insecurity because cooking oil and peanut butter were “not available” and to the indigenous belief that babies “could not swallow thick porridge.”

Children in Zimbabwe were at risk for disease due to poor maternal behaviors around sanitation and hygiene such as improper hand washing and storage of leftovers. Both of these behaviors stem from indigenous beliefs about sanitation and hygiene. To these mothers’ knowledge, people are less at risk for germs and disease when they are at home alone so they do not have to wash their hands with running water. While families only consume leftovers occasionally, they store the leftovers improperly, kept in a closed pot and near the fireplace to “maintain temperature” which they believe prevents contamination. Additionally, even though mothers used cups to feed liquids instead of bottles this does not stem from any knowledge regarding the health risk of using bottles, but from an inability to afford bottles.

Children were protected from some disease risk due to adequate maternal behaviors around breastfeeding. Several mothers were exclusively breastfeeding until 6 months. Mothers cited their formal health education about exclusive breastfeeding as the reason for this behavior.

*Pemba.* In Pemba the nutrient gaps were mostly in micronutrients (vitamin A, folate calcium, iron, and zinc), but many children were not consuming enough energy or protein. The micronutrient gaps were caused by mothers not feeding optimal amounts of fruits, vegetables, milk, and iron- and zinc-dense flesh foods. Mothers were also not preparing substantial, nutrient dense breakfasts and dinners which lowers the overall food intakes and produces the energy gap. The protein gaps were due to some mothers not feeding the available fish to their children. These behaviors were due to several contextual factors. Indigenous beliefs prevented children from consuming more vegetables, fish, and nutrient dense meals. Mothers reported that children

ate vegetables “when the family eats” them. Families said they were not eating many vegetables because of various reasons such as: 1) they could only eat vegetables with fish stew, 2) they did not have extra coconuts (which they perceived as an essential ingredient), 3) they did not have a garden to grow them, and 4) it was the dry season. We noted however that cassava greens were always available, even if other types of green leafy vegetables were not. Most families prepared fish daily, to the point that it became monotonous. When one mother was asked what she would like to eat, she said, “We’d have beef with rice because we have fish every day.” Interestingly, in the coastal village, infants were typically not given fish because of beliefs that fish will cause tooth decay or worms. The tradition in Pemba is to eat a light breakfast and dinner of tea and bread, and this meal is desired for infants as well. The larger agricultural and economic context determined when mothers could feed fruits to their children. Mothers in the inland site said they could not feed the seasonal mangoes to their children because “people sell them” in the larger markets or on the island of Unguja. The access to dairy and other iron- and zinc-dense flesh foods was limited due to local and household food insecurity as well as the larger agricultural and ecosystem context of being on a small island where fish are prevalent and extensive animal husbandry is not feasible.

Children in Pemba are at risk of disease due to poor sanitation and hygiene behaviors such as poor hand washing, feeding leftovers, and using baby bottles. Poor hand washing is again related to indigenous beliefs, and so is feeding leftovers to some extent. Leftovers are prepared intentionally and consumed for dinner and sometimes the following breakfast because “it’s more economical”. Even the more affluent prepare leftovers. Mothers in Pemba frequently used bottles to feed liquids and thin porridges claiming that it’s “easy to feed porridge with a bottle.” In the focus group discussions, mothers talked about needing to make porridge thin enough to feed in a bottle because it was the only food mothers could leave to feed the young baby when they returned to work in the fields around 2-4 months after birth. Maternal livelihoods are directly related to the household and local contexts as well as indigenous beliefs regarding female labor.

Children in Pemba are not consuming enough breast milk because of several maternal behaviors. Mothers explained that they introduced the solid foods before 6 months because “the baby was crying.” A few mothers reported ignoring health worker advice to breastfeed exclusively to 6 months. One mother said, “The nurses told me to stop (feeding solids) and breastfeed to 4 months but I continued.” Mothers stopped breastfeeding altogether when the mother became pregnant with another child because “the breastmilk goes bad”. These behaviors are caused by indigenous beliefs that do not support the formal health education mothers receive. These indigenous beliefs outweigh the formal education. Lastly, although these mothers were still breastfeeding, mothers reported being away from their children 2-6 hours per day for work, preventing infants from breastfeeding on demand during those times. This behavior is mostly related to maternal livelihood and time allocation just as bottle feeding was.

Appropriate educational strategies

*Zimbabwe.* Educational messages should focus on the barriers to the ideal practices that are a result of mistaken indigenous knowledge. Educating mothers to process family foods would open up infants’ access to several vitamin A-rich fruits and vegetables, vitamin C-rich fruits, and even protein rich legumes and seeds. Legumes are sometimes available and could be roasted, powdered, and reserved for infants’ porridge. Additionally, protein and micronutrient rich-indigenous flesh foods such as insects and rodents could also be given to children when they are available.

*Pemba.* Similar to Zimbabwe, Pemban mothers are not optimizing their children's diets with available foods and breast milk. However, the approach to education should focus on specific audiences as well as messages. A reason that these feeding problems persist was the disregard of health worker advice directed only at mothers. While health clinics have been a preferred teaching venue in Pemba, other approaches should be considered, e.g. expanding the target audience to include female elders and older mothers who are disseminating the incorrect advice ultimately heeded by younger mothers. Another problem was not breastfeeding on demand and using bottles to feed thin porridge when the mother went back to work. Education and promotion of expressing and cup feeding breast milk would be beneficial, but it would only be successful if other family members were involved. A more community-based approach would help build the capacity of all women who are helping to rear the children of the village.

Secondly, the education should target family eating practices as well as infant feeding practices because family practices often trickle down to become infant feeding practices. If family preparation of vegetables or eating more nutritious breakfasts and dinners were targeted in educational messages and recommendations to improve family consumption, this might trickle down to infants as well as benefit all family members. Concurrently, education could also target household sanitation/hygiene behaviors which would only help to protect the infant from infection. Again, there are identifiable causes of infant feeding problems that ultimately account for poor consumption of a variety of foods. Education should target these causes first to improve the capacity of mothers and other caretakers to provide the most nutritious diet available to their children.

## **Discussion**

Context played a large role in designing potential complementary feeding interventions in the regions of Zimbabwe and Pemba. We identified determinants at the local and household context levels that led an expanded view on nutrition education targeting the larger indigenous ways of knowing as well as household eating behaviors. Understanding the context presents several opportunities to improve the efficacy of our educational programs.

A careful examination of these two contexts revealed insights into the implementation of complementary feeding education. We know two things about complementary feeding education. First, some education is better than no education (Penny, et al., 2005). Second, messages should be clear, specific, and targeted to the problematic feeding practices (Penny, et al., 2005). Our research leads us to conclude in addition that educational messages should be grounded in the socio-cultural source of complementary feeding problems—the indigenous knowledge around food and child rearing. A basic principle of adult education is experiential learning (Fenwick, 2003; Knowles, 1980; Merriam, Caffarella, & Baumgartner, 2006). Adults already have a vast body of knowledge learned from their life experiences. They are not children with relatively open minds to fill. Therefore any presentation of new knowledge must be reconciled with their experience by critically reflecting on their past assumptions (Mezirow, 2009). Many nutrition education interventions do mention conducting formative research to understand the socio-cultural barriers to infant feeding when designing messages but this knowledge does not mean they were effectively mitigating them (Bentley, et al., 1991; Bhandari, et al., 2004; Caulfield, Huffman, & Piwoz, 1999; Menon & Ruel, 2007; Penny, et al., 2005; Santos, et al., 2001). Menon et al reported having developed culturally acceptable and feasible practices to promote but in the end only a third of the mothers adopted those practices often due to persistent, prohibitive cultural beliefs (Menon & Ruel, 2007). The mothers in the two sites we

studied have a complete and legitimate set of indigenous knowledge about infant feeding and eating in general. If we disregard that knowledge, mothers may not have the chance to fully comprehend the new knowledge. For instance, if we simply told mothers in Zimbabwe that it is healthy to feed green vegetables to a child every day, we are not addressing their knowledge that green vegetables will choke the child. This observation is why we suggest giving recommendations that recognize and take into account indigenous counter-knowledge.

Mothers not only have a culturally specific body of infant feeding knowledge, but they also have a culturally specific way of learning this knowledge (Gelfand, 1971; Reagan, 2000). This way of learning was most evident in Pemba, where mothers followed the advice of their elders rather than the health workers. Utilizing that indigenous way of learning would be constructive. In the same study by Menon et al, the preliminary research identified messages that should be targeted to grandmothers and fathers, but in the end the education was directed only at the mothers during monthly mothers' clubs. This adaptation of using indigenous ways of learning might have been a key to improving their promoted practices (Menon & Ruel, 2007). Also, mothers would have immediate access to safe and accurate support. An educational intervention in India found that counseling mothers at multiple opportunities had a positive effect on feeding practices (Bhandari, et al., 2005). Mothers would have sources of this information closer to their daily lives. Short of this, planners should at least be mindful of the legitimate position held by a community's indigenous way of learning. Projecting a western, formal way of learning on mothers may be the easiest to implement, but it may not be the most efficacious.

Our investigation of context through the comparison of these two sites is unique among similar research studies for two reasons. One, often comparisons are made between countries on different continents with the aim of generalizing to a global scale (Victora, et al., 2010). Both of our settings are in Sub-Saharan Africa. Two, even when comparisons are made within the same global region, rarely was the work conducted by the same researchers. Therefore the types of data collected could be very different (Pelto, Levitt, & Thairu, 2003). We had the opportunity to work in both of these settings and ensure that we collected the same type of data from each site. Moreover, comparing two similar food insecure settings in the same global region is the probably the best way to see and understand how seemingly small differences in the underlying contexts may potentially affect the successful development of nutrition education approaches.

There are some study limitations that should be mentioned. The research protocols were not identical, but this discrepancy was due to dissimilar elements required for the different feasibility studies. The sample sizes were small and not statistically representative of all children in the two settings. Small sample sizes are common for formative research methods because sampling is more purposive than random. Any discussion on the effect of the suggested approaches is speculative because these programs have yet to be implemented.

This study reveals several areas for future research and practice. One, continue the development of qualitative and quantitative methods for assessing context and culture in which to ground educational programs in both international and domestic settings. Two, use the data generated from this study just described to design educational interventions in these settings and determine if they make a difference in nutrition outcomes. Three, encourage researchers from a variety of disciplines, including adult education, to explore these areas of research. Lastly, persuade practitioners who design and implement educational programs to think beyond the "one-size-fits-all" approach by taking into account the context and culture within which they are working.

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