

Under-nutrition among HIV-exposed Uninfected Children: A Review of African Perspective

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ABSTRACT

There is a strong link between HIV and malnutrition. Malnutrition rates among HIV-infected children are reported to be high in most African countries. Under-nutrition or inadequate nutrition in HIV-exposed individuals increases the risk of mother-to-child transmission of HIV because all aspects of immune function are suppressed. High rates of malnutrition among HIV-infected children have been reported in sub-Saharan Africa. Child age is an important factor influencing the nutritional status of HIV-infected children. Poor maternal/caregiver education is an indicator of malnutrition in HIV-exposed children. Marital status of primary caregivers has been described as one of the factors influencing the nutritional status of children. Low maternal income is associated with malnutrition in HIV-infected and uninfected children

Keywords: under-nutrition, HIV, children, risks factors for under-nutrition in HIV-exposed uninfected children

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INTRODUCTION

Nutrition was first described as a clinical entity in the 1930s. Cecily Williams identified African children aged 6 months to her 4 years with a disorder characterized by diarrhea, irritability, skin and hair changes, and swelling of the extremities. She first published it under the headings 'Deficiency', then 'Nutritional disease', 'Kwashiorkor' and 'Malnutrition' (Rijpma, 1996). Some had reported the symptoms of malnutrition in tropical Africa before Cecily Williams, but she was the first to integrate them into clinical reality on the basis of etiological considerations died in the year. It was the highest rate, most severe and most prevalent malnutrition. The most severe and prevalent malnutrition. In many places, up to half the children were unlikely to live to the age of five (Rijma, 1996).

There is a strong association between HIV and malnutrition (Ivers et al., 2010). Severe wasting, also called 'thin disease', was one of the first recognized symptoms of HIV infection and was first reported in Africa in the early 1980s (Mbori and Kieffer, 2006). Various studies have shown that 4,444 of her HIV-infected and uninfected children are at increased risk of malnutrition (Wambura and Marnane, 2019). High rates of malnutrition among HIV-infected children have been reported in most African countries (Chalashika et al., 2017; McHenry et al., 2019).

Prevalence of under nutrition among HIV-exposed uninfected children

Poor or inadequate diets in HIV-exposed individuals increase the risk of mother-to-child transmission of HIV by suppressing all aspects of immune function (Beyene et al., 2018; Seyoum, 2016; Sashindran and Thakur, 2020). The prevalence and factors associated with malnutrition in children born to HIV-positive mothers vary widely by region (Madekwe *et al.*, 2022; Odo *et al.*, 2020).

Dara and her colleagues (2018) reported that in a retrospective cohort study of HIV-exposed uninfected infants and HIV-unexposed control infants born at Montefiore Medical Center in New York City, HIV-exposed Infected children whose birth weight was People who are not infected and have not been exposed (Nerilla, 2013). Comparing anthropometric results in a group of HIV-free and uninfected children under 2 years of age conducted at the University of Miami, USA, with similar results in HIV-uninfected children. Did. Long-term observational studies comparing groups found no differences. Anthropometric measurements between HIV-exposed, uninfected infants and unexposed, uninfected counterparts.

In sub-Saharan Africa, studies report high rates of malnutrition among HIV-infected children. In Botswana, charashika *et al.* (2017) compared nutritional status, dietary habits, and determinants of nutritional status in HIV-infected and uninfected children with HIV-uninfected and uninfected children, and compared HIV-infected children found that children with and without infection were more likely to be underweight (15.6% vs. 6.9%). %) were stunted (15.6% vs 7.3%), but not in vain compared to unexposed and uninfected controls. According to a prospective study by Rossouw et al. (2016), aimed to assess the dietary and nutritional status of HIV-uninfected and HIV-free

children during the first two years of life. Uninfected children without HIV had poorer anthropometric measurements than uninfected children.

In East Africa, Chepkorir *et al.* (2016) in a cross-sectional study done in a referral mission hospital in Bomet County in Kenya found a prevalence of 38.1 %, 19.5 % and 39 % for stunting, wasting, and underweight respectively. In Western Kenya, Megan *et al.* (2019) did a retrospective chart review of HIV-infected and HIV-exposed uninfected children and found that 45.0% of HIV-exposed uninfected children were stunted, 5.1% were wasted, and 14.8% were underweight. In Mukuru Slums in Nairobi, Nduta and Marnane (2019), in a retrospective cohort study reported stunting as the commonest form of under nutrition (38.9%) among HIV-exposed infants, wasting and underweight were observed respectively with 5.6% and 24.4%. In Rwanda, according to a cohort study done by Lane and colleagues (2019) most of the HIV-exposed uninfected children had a normal nutritional assessment. The mean WLZ was 0.53, and mean length-for-age z-score (LAZ) was -1.14 over the first 2 years of life; stunting, wasting and underweight was 13.4%, 0.7%, 4.1% respectively.

Factors associated with under nutrition among HIV-exposed children

The recognition of factors that affect nutritional status of HIV-exposed children is among the mainstays in reducing the prevalence of under nutrition.

Sociodemographic factors

The age of the child is an important factor that can affect the nutritional status of a HIV-exposed child. A cohort study done by Mofenson *et al.* (2019) in Brazil and South Africa evaluated 1,000 HIV-exposed uninfected infants found that under nutrition, especially stunting, peaked at one month of age. Magadi (2011) reported that the peak age for undernutrition among HIV-exposed uninfected children living in sub-Saharan Africa is one year. In Tanzania, McDonald and colleagues (2013) found a median time to first episode of stunting, wasting, and underweight was 8.7, 7.2, and 7.0 months respectively.

Studies have found that there is a higher prevalence of under nutrition among HIV-exposed male when compared to female children (Condo *et al.*, 2015; Magadi, 2011; Nduta and Marnane, 2019). However, other studies did not find any anthropometric difference between boys and girls (Chalashika *et al.*, 2017; McHenry *et al.*, 2019; Sobze *et al.*, 2014).

Lower level of mother/caregiver's education is a predictor of under nutrition among HIV-exposed children. HIV-exposed children born to mother with low level of education are more likely to be undernourished (Chalashika *et al.*, 2017; McHenry *et al.*, 2019).

The family size influences the feeding practices at the household level and therefore affects the nutritional status of children (Gebreyesus *et al.*, 2018). Increased number of siblings leads to household food insecurity and is recognized to be associated with under nutrition among HIV-exposed uninfected children (Chalashika *et al.*, 2017).

The marital status of the primary caregiver has been described as one of the factors affecting the nutritional status of the child. Muhangi and colleagues (2013) reported a higher prevalence of under nutrition among children born to single mothers. However, Chalashika and colleagues (2017) did

not find any association between primary caregiver's marital status and under nutrition among HIV-exposed uninfected infant.

Low maternal income has been associated with under nutrition among HIV-exposed uninfected children (Chepkorir *et al.*, 2016; Kamenju *et al.*, 2017; Muhangi *et al.*, 2013). In contrast, a cross-sectional study conducted in Southern Ethiopia by Haile and colleagues (2015) reported that maternal monthly income was not associated with under nutrition.

Medical factors

Most HIV-exposed uninfected infants have a low birth weight and show a pattern of slightly accelerated growth in the first 2 years of life (Dara *et al.*, 2018). Chalashika *et al.* (2017) reported that a higher birth weight among HIV-exposed uninfected children was negatively associated with being underweight; Each 1 kg increase in weight reduced the risk of being underweight by 82%. Similar findings were reported by McDonald *et al.* (2013) in Tanzania.

Studies have reported that an increased morbidity is associated with under nutrition among HIV-exposed infants (Bailey *et al.*, 1999; Chalashika *et al.*, 2017; Mcgrath *et al.*, 2012). Chepkorir *et al.* (2016) reported that a recent history of morbidity does not increase the risk of stunting as well as underweight. Chalashika *et al.* (2017) found that infections in infants, especially diarrhoea, accounted for the increased risk of stunting in HIV-Exposed uninfected compared to HIV-unexposed uninfected infants. However, McDonald *et al.* (2013) in their study reported that the number of cumulative episodes of diarrhoea, fever, common cold, vomiting, loss of appetite, and cough were not significantly associated with the risk of stunting.

Maternal nutritional status is correlated to under nutrition among HIV-exposed infants (Lane *et al.*, 2019; McDonald *et al.*, 2013). However, Kamenju *et al.* (2018) in a prospective study aiming to measure complementary feeding and to determine its association with nutritional status among HIV-exposed infants followed from 6 to 24 months of age in Dares Salaam found no relationship between maternal nutritional status and under nutrition among HIV-exposed uninfected children. Similar results were also reported by Haile and colleagues (2015) in Southern Ethiopia.

Feeding practices

Feeding practices of children born to HIV infected mothers should support the greatest likelihood of HIV-free survival of children and not harm the health of mothers (WHO, 2010). The World Health Organization (2008) has established indicators for assessing feeding practices among infant and young children. These include early initiation of breastfeeding within 1 hour from birth, exclusive breastfeeding during the first 6 months, continued breastfeeding at 1 year, introduction of solid, semi-solid or soft foods at 6 months of life, minimum dietary diversity, minimum meal frequency, minimum acceptable diet and consumption of iron-rich or iron-fortified foods.

The WHO recommends exclusive breastfeeding for the first 6 months after birth, introduction of appropriate complementary foods thereafter, and continued breastfeeding least up to 12 months of age (WHO, 2016). Exclusively breastfed HIV-exposed infants are less likely to develop under nutrition when compared to those on mixed feeding methods (Chepkorir *et al.*, 2016). However, mixed feeding is common among HIV-exposed children (Negash *et al.*, 2019; Rossouw *et al.*, 2016; West *et al.*, 2019).

Chalashika *et al.* (2017) reported that HIV-exposed uninfected children were less likely to be breastfed after 12 months compared to their HIV-unexposed uninfected counterparts. Similar

findings have been reported by Muhangi *et al.* (2013) in Uganda where HIV-exposed uninfected children had a shorter average breastfeeding duration compared to HIV-unexposed infants (mean 7.80 months versus 16.73 months).

The dietary diversity minimum score was developed to assess dietary diversity as part of infant feeding practices. If the score is 4 or above, the diet is changing (WHO and UNICEF, 2017). According to a study by Haile *et al.* (2015), 65.6% of HIV-exposed but uninfected children had not consumed the recommended number of food groups in the previous 24 hours. Bottle-fed infants had an average nutritional diversity score of 2.12, while non-bottle-fed infants had a mean nutrient diversity score of 3.73. In a study by Eubalev *et al.* (2018), only 25.5% of HIV-infected and uninfected children received the optimal supplement. Chalashika *et al.* established a link between malnutrition and minimum diversity scores (2017) found that lower scores on dietary diversity in HIV-exposed but uninfected children were not significantly associated with increased risk of malnutrition.

The World Health Organization (2008) recommends that breastfed infants aged 6–8 months should receive at least 2 feedings and breastfed children aged 9–23 months should receive 3 doses of breast milk. We recommend a minimum of 4 feedings for unnursed children aged 6-23 months. Haile *et al.* (2015) reported that HIV-infected but uninfected children ate less frequently. Most of the HIV-uninfected, uninfected children (53.3%) had not received complementary foods frequently enough in the previous 24 hours. Mean 24-hour meal time scores were higher in bottle-fed infants than in non-bottle-fed infants (2.79 vs. 2.15). Eubalev *et al.* (2018) reported that 70.7% of HIV-infected and uninfected children ate at recommended meal frequencies.

CONCLUSION

There is a strong association between HIV and malnutrition. Malnutrition rates among HIV-infected children are reported to be high in most African countries. Poor or inappropriate diets in HIV-exposed individuals increase the risk of mother-to-child transmission of HIV, as all aspects of immune function are suppressed. In sub-Saharan Africa, studies report high rates of malnutrition among HIV-infected children.

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