

A cross-sectional study on mother's knowledge, feeding practices, childcare and malnutrition in Sumbawanga, Tanzania

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Abstract

Background: Malnutrition is the major cause linked to many diseases and is a burden recognized in many developing countries including Tanzania. A child's intake can have a significant impact on health, growth and development. Understanding mothers' knowledge of children's intake can play a vital role in improving their nutritional status. This study aimed at exploring mother's knowledge, feeding practices, childcare and malnutrition among children aged between six months and five years.

Methods: A hospital-based cross-sectional study was undertaken in Sumbawanga municipal, from September to December 2020. Data was collected from interviews filled in structured questionnaires among mothers of children aged six months to less than five years. Data were analyzed using SPSS version 20 based on a total of 190 study participants. Descriptive statistics and χ^2 tests were used to assess the significance levels of associated variables.

Results: The total sample of children included in the study was 190, therefore 190 mothers. Out of the 190 mothers, 65 (34.21%) had not attended formal education, 53 (27.89%) had a primary education level, 42 (22.11%) had a secondary education level and 30 (15.79%) has a college or university education level. The majority of mothers, 145 (51.58%) were single, divorced or widowed whereas the majority of mothers, 51.58% (98) were not employed. Marital status and education level had an impact on child's care and malnutrition reported cases ($\chi^2 = 15.06$, $p < 0.0001$). Food availability in families of many children with more individuals living together showed to be significantly associated with incidences related to malnutrition ($\chi^2 = 25.76$, $p < 0.001$). Mother's feeding practices of less than two times a day showed to be significantly associated with and incidences related to malnutrition ($\chi^2 = 23.54$, $p < 0.0001$). Mother's good maternal care showed to be significantly associated with attendance to ANC services and husband/ partner's financial support ($\chi^2 = 43.22$, $p < 0.001$).

Conclusion: Current mothers' knowledge and practices about malnutrition and incidences of nutritional related-illness in children in Sumbawanga municipal calls for urgent health education to improve children's health status.

Keywords: Children, Malnutrition, Mother's Knowledge, Childcare

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Introduction

Malnutrition remains one of the most common causes of morbidity and mortality among children throughout the world. It has been responsible, directly or indirectly for 60% of 10.9 million deaths annually among children under 5 years (WHO, 1999). Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life (WHO, 2003). 52 million children under 5 years of age are wasting, 17 million are severely wasted and 155 million are stunted while 41 million are overweight in 2018 globally (Dukhi, 2020). As many as 800 million people worldwide are affected by malnutrition (Benson & Shekar 2006).

Nearly 30% of humanity suffers from one or more of the multiple forms of malnutrition globally (WHO, 2018). It is important to address childhood malnutrition as a prerequisite for achieving internationally agreed goals to reduce malnutrition and child mortality. Child growth is therefore internationally recognised as an important public health indicator (Oruamabo, 2015). Malnutrition

includes undernutrition, specific nutrient deficiencies, and overnutrition; and it kills, maims, retards, cripples, blinds, and impairs human development on a truly massive scale worldwide (Oelofse, 2001).

According to the Food and Agriculture Organisation (FAO), the proportion of children under five years old children who are underweight in South Eastern and eastern Asia rose from six to nine per cent between 1990 and 2003 (FAO, 2015). In Africa, malnutrition prevalence is 32% (WHO, 2003, Benson & Shekar 2006). More than half of the children in South Asia are malnourished, while the average for developing nations in 2003 stood at one-third (Hatlebakk, 2012).

In Ghana, malnutrition rates for all age groups of children less than five years have increased steadily over the past six years (Neequaye & Okwabi, 2012). In Ghana, the rate of malnutrition peaks in the 12-23 months age group. In 2007, almost eight per cent (7.8%) of children aged 0-11 months were found to be malnourished in Ghana. This shows a steady increase from 4.1% in 2005 to 4.9% in 2006 to the current figure. For children aged 12 - 23 months, 10.1% were malnourished in 2007 as compared to 8.2% in 2006 (USAID, 2018). The highest rate of 28.2% was recorded in Upper West region, while Brong-Ahafo recorded the lowest rate of 3.3%. The malnourished rate among children 24-59 months' age group was 7.3% in 2007 as compared to 6.2% in 2006. The rate of malnutrition among children less than 5 years in Ashanti region as compared to other regions, is suggested to be relatively low, however, in nominal terms, the regions recorded one of the highest cases. The Bosomtwe district, a district in the Ashanti region, is predominantly rural with high cases of malnutrition that affect children less than five years. In 2004, the district recorded a malnutrition rate of 6.9% which decreased to 5.5% in 2005 (Neequaye & Okwabi, 2012). Country-wide nutrition surveys indicate that acute malnutrition in Eritrea ranged from 10% - 20% depending on the area (Kelati *et al.*, 2015).

In Tanzania, malnutrition remains a key health issue and a nutritionally related condition (Juma *et al.*, 2016). It has been reported that 34% of children under five years of age are stunted. Five per cent of young children are wasted or too thin for their height. At the other extreme, 4% are overweight or over nourished, an extreme form of malnutrition (TDHS-MIS, 2016). It is estimated that 43% of under-five-year-olds have low heights for age (Grantham-McGregor *et al.*, 2007).

Studies have shown that stunting is associated with poor developmental attainment in young children and poor school achievement or intelligence levels in older children (Blössner & De Onis, 2005). Children affected by marked growth retardation become adults with limited biological and intellectual abilities that diminish their working capacity (Harold W. Kohl *et al.*, 2013). Studies indicate that hospitals and facilities attending populations of under-five children in and around Bagamoyo suffered moderately high rates of malnutrition, with the overall proportion of stunting, underweight and waste was 8.37, 5.74 and 1.41 % respectively (Juma *et al.*, 2016).

Studies on the number of admissions with acute and chronic malnutrition at the local hospital were linked with seasonal food insecurity and intake (McQuade *et al.*, 2019). Acute and chronic malnutrition is associated with. Targeting prenatal care and child-feeding interventions during high food insecurity months may help reduce child malnutrition even though the rate is decreasing. The district has expressed concern about the trend and is unable to predict the socially related causes coupled with interventional factors that have accounted for the trend, this research was intended to examine the extent to which the malnutrition status of children in Sumbawanga municipal is related to knowledge and the socioeconomic characteristics of their parents and also concerning access to health services interventions on malnutrition.

Materials and methods

Study site

This study was conducted in Sumbawanga municipal health facilities. The Municipality has 36 health facilities which include 1 Designated Municipal Hospital (DMH), a Regional hospital, 3 health centers, and 31 Dispensaries. The number of people served by each facility is enormous. For example, a health center serves 84,370 and a dispensary records attendance of more than 6,750 (URT, 2013). The

municipal enjoys a tropical climate with mean temperatures ranging between 13°C for June and July to 27°C in the hottest months from October to December. The municipal has unimodal reliable rainfall ranging between 800 and 1300 mm per annum. The dry season occurs after the rainy season and lasts until October. The main staple foods are maize, rice and beans except for some parts where cassava and rice are the main sources of food. Other food crops widely available include groundnuts, finger millets, potatoes, sorghum, wheat and sugarcane. Meat is easily available from the Agropastoral community who traditionally keep varieties of domestic animals such as cattle, goats, sheep, pigs, rabbits, chickens, ducks, guinea fowls, and pigeons. The local economy is largely dependent on agriculture and small locally owned businesses. There is very limited industry or production in the town.

Study design and data collection

This is a hospital-based cross-sectional study undertaken in Sumbawanga municipal from September 2020 to December 2020. The data collection technique used was the interview method filled in with structured questionnaires among mothers of children six months to less than five years. The target population included all children above 6 months and under five years. The instruments used for the children’s mothers were questionnaires containing close and open-ended questions. The information was including socio-demographic characteristics, knowledge, and awareness on malnutrition. Samples for the study included all children aged six months and up to less than five years and their mothers. A random sampling technique was used to obtain a representative sample. The representative sample of the population was determined by using the Kish and Leslie formula. Sample size calculations were adjusted based on the current population of the study site of 209,793 individuals, of which 100,734 were males and 109,059 were females with an average household of 4.8 members (URT, 2013).

Statistical analysis

The data were analyzed statistically using IBM SPSS Statistics 19.0 (IBM Corp., Armonk, NY, USA). Descriptive and inferential statistics were used to describe and make inferences from the data where applicable. The descriptive statistics for categorical variables were expressed in the number and percentage. Chi-square test for categorical variables according to the expected counts. Chi-square and confidence intervals of the main outcome variables were cross-analyzed with independent variables including the social and economic characteristics of women. The χ^2 test was applied to determine associations between variables and was considered significant when the p-value was less than 0.05.

Results

Demographic characteristics

A total of 190 children were included in the study, as shown in Table 1. 110 (57.89%) children were females and 80 (42.11%) were males. Most of the children’s age ranged from two to three years 55 (26.32%), followed by children with less than one year 43 (22.63%). In this study, a total of 190 mothers of children were interviewed. Mother’s marital status indicated that 70 (36.84%) mothers were single, 45 (23.68%) mothers were married, 50 (26.32%) mothers were widowed and 25 (13.16%) mothers were divorced. Educational background indicated that 65 (34.21%) mothers had no formal education, 53 (27.89%) mothers had a primary school education, 42 (22.11%) mothers had a secondary school education level, and 30 (15.79%) mothers had a college or university level education. Marital status and education level had an impact on child’s care and malnutrition reported cases ($\chi^2 = 15.06$, $p < 0.0001$).

Table 1: Demographic characteristics of study participants attending health facilities in Sumbawanga

Variable	Factor	Frequency (%)	χ^2 (p-value)
Age of children (Years)	6 Months – < 1 Year	43 (22.63)	17.2105 (0.0018)
	1 – < 2 Years	34 (17.89)	
	2 – < 3 years	55 (26.32)	
	3 – < 4 years	38 (20.00)	

	4 – < 5 years	20 (13.16)	
Sex of children	Male	80 (42.11%)	4.7368 (0.0295)
	Female	110 (57.89%)	
Marital status	Married	45 (23.68)	21.5789 (0.0001)
	Single	70 (36.84)	
	Divorced	25 (13.16)	
	Widowed	50 (26.32)	
Level of education	No formal education	65 (34.21)	14.1684 (0.0027)
	Primary education	53 (27.89)	
	Secondary education	42 (22.11)	
	College/University	30 (15.79)	
Religion	Christianity	85 (44.74)	68.1579 (< 0.0001)
	Muslim	95 (50.00)	
	Others	10 (5.26)	
Work status of the father	Teacher	50 (26.32)	18.4211 (0.0004)
	Nurse	30 (15.79)	
	Trader	40 (21.05)	
	Others	70 (36.84)	

Food availability and incidences related to malnutrition

The findings showed that 99 (52%) mothers were not employed while 91 (48%) of them were employed. 90 (47.37%) of mothers had enough money to buy food and essentials for the whole family, whereas only 46 (24.21%) mothers were able to provide food for the family throughout the year. The majority of families had three or more children (67, 35.26%) whereas only 32 (16.84%) families had one child. It was reported that childbirth spacing was less than one year in 43 (22.63%) families, 55 (28.95%) families reported childbirth in the space of two years, and 60 (31.16%) families more than three years of childbirth spacing. The majority of the families, 86 (45.26%) reported having more than four people who feed together in their family. Also, it was reported that 89 (46.84%) mothers had their child been falling sick recently and 91 (47.89%) were not as shown in Figure 1. Of the children falling sick, 20 (47.19%) were associated with kwashiorkor, whereas 22 (52.81%) were associated with marasmus. Food availability in families of many children, with more individuals living together, showed to be significantly associated with incidences related to malnutrition ($\chi^2 = 25.76$, $p < 0.0001$).



Figure 1: Food availability and malnutrition incidences among study participants attending health facilities in Sumbawanga municipal, Tanzania

Childcare and maternal health

In this study, 100 (52.63%) mothers reported having been attending ANC during pregnancy. 18 (9.47%) mothers attended ANC when they had less than one month of pregnancy, 20 (10.53%) mothers attended ANC during the two months after pregnancy, 22 (11.58%) mothers attended ANC after three months of pregnancy and 40 (21.05%) attended after four months of pregnancy. Study findings indicated that 11 (5.79%) mothers were self-made decisions to attend ANC during pregnancy, whereas 22 (11.58%) were influenced by their husbands/partners, 26 (13.68%) were parents' decisions, 31 (16.32%) were relatives' decision and 10 (5.26%) were decisions from other people.

It was also reported that financing to attend ANC during pregnancy came from themselves by 9 (4.74%) mothers, 26 (13.68%) mothers reported financial support came from their husbands/partners, 31 (16.32%) mothers reported financial support came from their parents, 12 (6.32%) mother reported financial support came from their relatives and 22 (11.58%) mothers reported their financial support came from other sources. Mothers reported by 45 (23.68%) that their neighbours were taking care of their children in case of their absence, whereas 57 (30.00%) mothers reported their children to be taken care of by their grandmothers, 63 (33.16%) mothers reported to send children to caregivers and 25 (13.16%) mother reported other sources for taking care of children in their absence as shown in Table 2. 101 (53.16%) children were vaccinated while 89 (46.84%) were not. Mother's good maternal care showed to be significantly associated with attendance to ANC services and husband/partner's financial support ($\chi^2 = 43.22, p < 0.0014$).

Table 2: Maternal care status among study participants attending health facilities in Sumbawanga municipal, Southern Highlands of Tanzania

Variable	Factor	Frequency (%)	χ^2 (p-value)
Attend ANC Services	Yes	100 (52.63)	0.5263 (0.4682)
	No	90 (47.37)	
Child age during first start attending ANC services	Less than 1 month	18 (9.47)	12.3200 (0.0064)

	2 months	20 (10.53)	
	3 months	22 (11.58)	
	4 months and above	40 (21.05)	
Decision to attend ANC services	Self	11 (5.79)	17.1000 (0.0018)
	Husband/Partner	26 (13.68)	
	Parent	31 (16.32)	
	Relatives	22 (11.58)	
	Other	10 (5.26)	
Sponsors to attend ANC services	Self	9 (4.74)	17.3000 (0.0017)
	Husband/Partner	26 (13.68)	
	Parent	31 (16.32)	
	Relatives	12 (6.32)	
	Other	22 (11.58)	
Breastfeeding after delivery	Yes	100 (52.63)	0.5263 (0.4682)
	No	90 (47.37)	
General time for breastfeeding (minutes in an hour)	< 10	65 (34.21)	16.8632 (0.0008)
	15	56 (29.47)	
	20	41 (21.16)	
	> 20	28 (14.74)	
Complementary feeding after six months	Yes	103 (54.21)	1.3474 (0.2457)
	No	87 (45.79)	
Caretaking of children	Neighbours	45 (23.68)	17.7474 (0.0005)
	Grandmother	57 (30.00)	
	Caregiver	63 (33.16)	
	Other	25 (13.16)	

Feeding practices

It was reported that 100 (52.63%) mothers gave their children breast milk after delivery while 90 (47.37%) were not able to breastfeed their children. It was also reported that the hourly time for breastfeeding children was less than ten minutes by 65 (34.21%) mothers whereas 56 (29.47%) mothers reported the hourly time of breastfeeding to be fifteen minutes, 41 (21.16%) mothers reported the time to be twenty minutes, and 28 (14.74%) mothers reported hourly time for breastfeeding to be more than twenty minutes. Findings showed that 103 (54.21%) mothers gave their children water and complimentary food during the first six months of life while 87 (45.79%) did not.

It was reported that the breastfeeding time per day was four times among 28 (14.74%) mothers, three times among 41 (21.58%), two times among 48 (25.26%), once among 54 (28.42%) and 19 (10%) mothers were not able to know the exact number of times were able to breastfeed their children. Mother's feeding practices of less than two times a day showed to be significantly associated with incidences related to malnutrition ($\chi^2 = 23.54$, $p < 0.0001$).

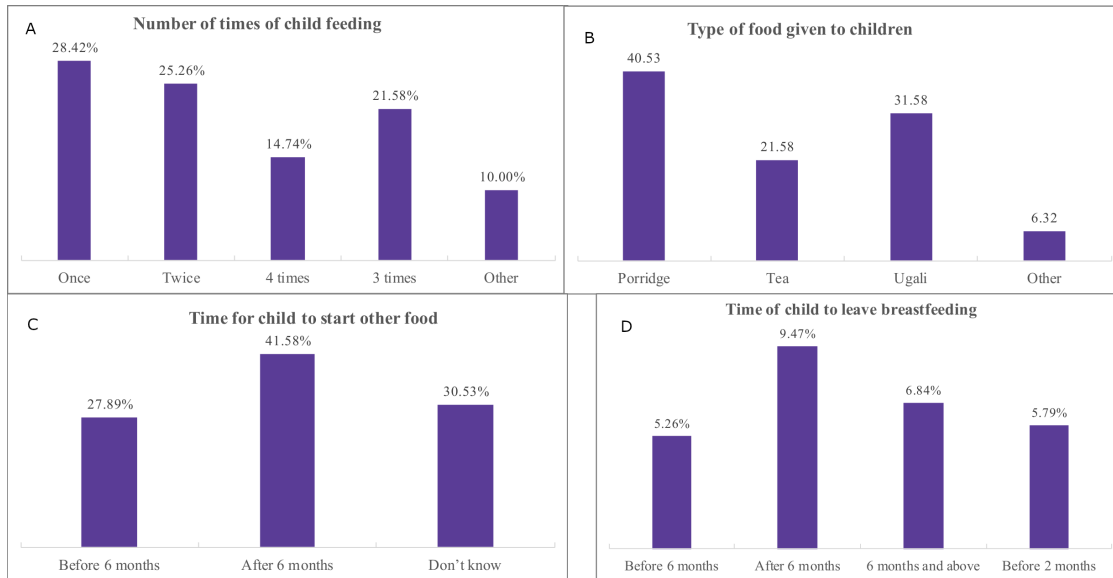


Figure 2: Feeding practices of participants attending health facilities in Sumbawanga municipal, Tanzania Water, sanitation and toilet facilities

It was reported that the source of water for mothers and their children use was mainly streams or ponds in 77 (40.53%) families, hand-dug wells in 46 (24.21%) families, boreholes in 10 (5.26%) families and pipe-borne in 57 (30%) families. Most of the toilet facilities used were pit latrines in 93 (48.95%) families whereas others reported using bucket toilets in 75 (39.47%) families and water closets in 22 (11.58%) families.

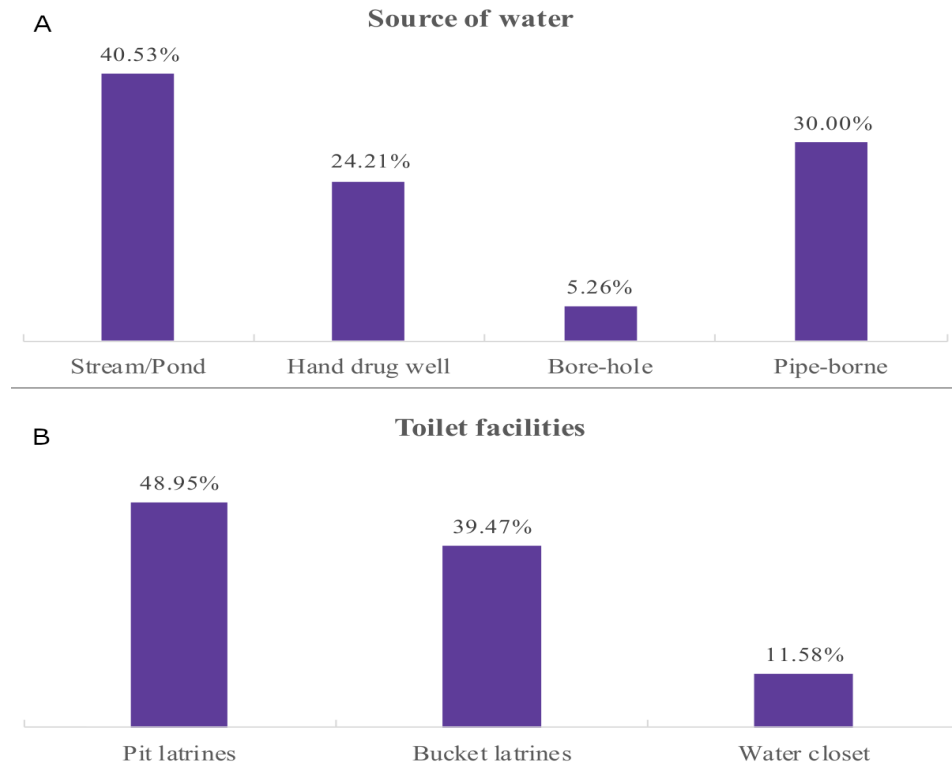


Figure 3: Water, sanitation and toilet facilities used among participants attending health facilities in Sumbawanga municipal, Southern Highlands of Tanzania

Discussion

Our study found marital status and education levels had an impact on child care and malnutrition reported cases. Findings from studies that have investigated the association between nutritional knowledge and child nutritional status are inconsistent (Appoh & Krekling, 2005; Saaka, 2014). Whereas some studies have found a significant association between maternal nutrition knowledge and child nutritional status, the social characteristics of parents, especially mothers, have been identified by some scientists as related to the nutritional status of children (Fadare *et al.*, 2019).

A study on the socio-cultural influences on infant feeding decisions among women in Kwa-Zulu Natal showed that mothers' age has a greater influence on the food practices and choices for children less than five years. Mothers of older age intended to be more independent as to the choice of food they gave their children than those younger (Walsh *et al.*, 2015). Mothers socio-demographic and economic characteristics play a major role in determining the nutritional status of children less than five years (Asmare *et al.*, 2018). Findings show that child nutritional status is enhanced by the mothers' background characteristics, including age, employment status and educational status (Nankinga *et al.*, 2019).

In assessing the determinants of nutritional status among children less than five years ago, one study involving 300 women in rural Nigeria found a strong association between the age of the mother, occupational status and employment, and the risk of undernutrition among children (Ene-Obong *et al.*, 2001). It was elaborated that the extent of women's independence from their partners has a resultant effect on the nutritional status of the children (Ene-Obong *et al.*, 2001). A study in Volta Region, Ghana showed evidence that maternal nutritional knowledge and socioeconomic status influence the nutritional status of their children (Appoh & Krekling, 2005). The study, which enrolled a

sample of 110 mothers, showed that there was a strong association between the marital status of mothers and the nutritional status of their children. In addition, maternal knowledge and practices on breastfeeding was a significant indicator for the nutritional status of the child (Appoh & Krekling, 2005). Specifically, marital status, educational status, and socio-economic status had a significant association with the nutritional status of the child.

In our study, we found that food availability in families of many children, with more individuals living together, eating together shown to be significantly associated with incidences related to malnutrition in children. This is directly linked with household food security. Despite that, globally, there has been an average increase of over 75% in hectares of land under cultivation resulting in increases in production above 50% for all the crops (FAO, 2017), food availability of major concern. During these periods of a bumper harvest of foods such as vegetables, fruits, roots crops and plantain, inadequate preservation and storage facilities lead to waste, lowered prices, and extended periods of scarcity (FAO, 2017). There is an urgent need to improve traditional complementary foods in communities in terms of energy density, amount of fat in the diet, and bioavailability of macro and micronutrients (FAO, 2017). The incidence of malaria, diarrhoea and measles are factors contributing to child mortality and malnutrition (Caulfield *et al.*, 2004).

Feeding practices have a lot of implications for the nutritional status of the child. A mother's knowledge about nutritious meals for the children influences how the child is fed. 31% of mothers with babies 0 – 2 years consider cow's milk as best for the growth of children (WHO, 2009). Some mothers consider breast milk harmful when mothers get pregnant and need counselling (Heymann *et al.*, 2013). Knowledge of exclusive breastfeeding by mothers often leads to an improvement in complementary feeding practices (Tampah-Naah *et al.*, 2019). In India, an interventional study where nutritional education was given to mothers to improve awareness about infant feeding in the variety, quantity, quality and consistency of complementary feeding showed that 80% initiate breastfeeding after 3 days of birth, 54.3% absence of exclusive breastfeeding 86% delayed complementary feeding practices which were inadequate in quality, quantity, frequency and consistency (Sethi *et al.*, 2003).

In a similar study in southern India, mothers were counselled about their choice of appropriate complementary foods and feeding frequency. In that study, the counselled group improved feeding practices such as avoiding feeding bottles and increased various types of complementary food improvement (Berisha *et al.*, 2017). Time of introduction and type of complementary food given to an infant are very important for the child's nutritional status (Wang *et al.*, 2019).

The findings of this study will help to promote and improve children's health and wellbeing in nutritional status in impoverished communities. It was necessary to provide more insight into the relationship between maternal knowledge and child health outcomes. Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations (Jones & Berkley, 2014). Children who suffer from growth retardation as a result of poor diets and recurrent infection tend to have more frequent episodes of severe diarrhoea and are more susceptible to several infectious diseases such as malaria, meningitis and pneumonia (Rodríguez *et al.*, 2011).

Several studies demonstrated the association between the increasing severity of anthropometric deficits and mortality (Oelofse, 2001; Rodríguez *et al.*, 2011; Schwinger *et al.*, 2019). The substantial contribution to child mortality of all degrees of malnutrition is now widely accepted. In addition, there is strong evidence that impaired growth is associated with delayed mental development, poor school performance and reduced intellectual capacity (Asmare *et al.*, 2018).

Conclusion

To combat malnutrition, findings from our study urge that the government, in collaboration with health care providers, provide mothers with health education about water treatment, bathroom facilities, breastfeeding, immunizations, and prenatal clinics. Mothers had an acceptable amount of

information about child malnutrition; however, this knowledge should be improved in some areas, while it was lacking in others. Mothers' educational levels, the number of children, breastfeeding, the number of people in the household, immunization, and attendance at a prenatal clinic were all significant influences on their knowledge.

Declaration

Conflict of interest: The authors declare that they have no competing interests

Consent for publication: Not applicable

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Author contributions: PP and CNM designed the study. PP conducted or contributed to the data analysis. PP and CNM interpreted the data. CNM has prepared the original manuscript. All co-authors contributed to subsequent revisions and approved the final version. All authors have read and approved the final manuscript.

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