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Research Article

The Association between Stunting and Maternal Knowledge and Practices in Infant and Young Child Feeding in Mutasa, Zimbabwe

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Abstract: Stunting remains a global public health problem and poor Infant and Young Child Feeding (IYCF) practices are key contributory factors. The objective of this study was to determine the association between stunting and the IYCF knowledge and practice of mothers with children aged 6-59 months. A cross sectional study was conducted in Mutasa District involving children aged 6-59 months and their mothers (n=82). Interviews were conducted that collected information on demographics and IYCF knowledge and practices. Weight, height and Mid Upper Arm Circumference (MUAC) were measured according to WHO guidelines. ENA for SMART software was used to compute Weight-for-Height (WHZ), Weight-for-Age (WAZ), and Height-for-Age (HAZ) z scores. Data analysis was done using SPSS version 20. In this study 28% of the children were stunted, 9.8% were overweight, 4.9% were wasted and 4.9% were underweight. 75.6 % of the mothers successfully breastfed their infant within first hour after delivery, breastfeeding was high at 82.9 %. While, only 13.4% continued breastfeeding up to the age of two years. The prevalence of stunting was highest in boys (40%) than girls (16.7%), P=0.019. Higher birth order (P=0.01) was significantly associated with stunting. The higher the birth order the higher the likelihood of stunting (P=0.010). Stunting was more common in the age group 24-59 months (32.4%) compared to age group 6-23 months (25%) (P=0.465). There was a significant association between knowledge on early initiation of breastfeeding and its practice (P=0.003). Stunting prevalence was high mostly affecting boys. Therefore, ongoing multisectoral community based stunted reduction initiatives should be strengthened in this and related settings.
Keywords: IYCF, breastfeeding, stunting, wasting, Zimbabwe

INTRODUCTION

Stunting affects approximately 159 million children under 5 years old worldwide and a greater proportion of these children are in sub-Saharan Africa and south-central Asia (UN, 2015). In Zimbabwe, stunting remains the most prevalent form of undernutrition in children under 5 years old (ZIMVAC, 2019) . While the prevalence of stunting and wasting in children under five has been decreasing globally over the past two decades, in 2016 Zimbabwe indicated a worsening nutrition situation, the Global Acute Malnutrition (severe acute malnutrition and moderate acute malnutrition combined) rate of children aged 6-59 months was at 5.7% the highest recorded in 15 years. Severe Acute Malnutrition rate was at 2.1%, slightly above the 2% threshold for emergency response (ZIMVAC, 2016) and the current national stunting rate is at 26.2% (ZNNS, 2018). Mutasa district in Manicaland province recorded a high stunting rate (31%) above the national level (26.2%) (ZNNS, 2018). Malnutrition is often associated with sociodemographic

factors, income level, employment status, education level of the mother and food insecurity (Franchetti & Ide, 2014). However, the relationship between stunting and sociodemographic determinants remains unclear. In the African context, stunting is usually associated with poor breastfeeding, complementary and young child feeding practices. There is evidence that this could be due to the fact that the complementary foods commonly consumed are usually cereal based and deficient in key micronutrients (Faber *et al.,* 2016). Therefore, this study was conducted in a community with high stunting levels to investigate sociodemographic characteristics and the association between IYCF practices and stunting in children aged 6-59 months.

METHODS

Study setting and design

A descriptive cross-sectional study was conducted in Mutasa at Mutasa District Hospital. The selection criteria for the district was based on its high stunting rate of 31% which was above the national

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stunting rate (26.2%). Mutasa district is one of seven districts in the Manicaland province of Zimbabwe and located 267km from the capital Harare. Population in Mutasa stood at 169,000 with an under five population of 27,040 as of the last census held in 2012 (Zimstat, 2012).

Participants and sampling

The study enrolled 82 children 6-59 months and their mothers. The inclusion criteria were all children aged 6-59 months who had not fallen sick in the past 30 days and their mothers. Children who had been ill in the past 30 days and not accompanied by their mothers were not included in the study. Eligible mother and baby pairs were enrolled consecutively until the sample size was achieved as they visited the health facility for growth monitoring and antenatal care (ANC) sessions. The sample size was determined using simple modified Cochran formula for smaller populations (Cochran,1977). A minimum sample size of 82 was found to be adequate.

Data collection and tools

Face to face interviews were conducted guided by a structured questionnaire. Information on socio-demographic characteristics: age of the child, sex of the child, number of children under the age of 5 years in the family, position of the baby, educational status of the mother; knowledge and infant feeding practices of mothers: initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding up to 6 months, continued breastfeeding up to 24 months and complementary feeding practices were collected. The mothers provided information on infant feeding practices on children 6-59 months. Anthropometric parameters (weight, height and MUAC) were obtained from the children as per WHO protocols. The weight of the children was measured using a calibrated digital scale (SECA, Model 703, Hamburg, Germany). Height and length were measured to the nearest millimeter with graduated wooden height boards. MUAC was measured using the standard color-coded UNICEF MUAC tapes with measurements taken to the nearest millimeter. The nutrition indicators for stunting [Height-for-Age z score(HAZ) $\leq$-2SD], wasting [Weight-for-Height z score(WHZ) $\leq$-2SD],

underweight [Weight-for-Height z score(WHZ) $\leq$-2SD], and overweight [Weight-for-Height z score(WHZ) $\geq$+2SD] and obese[Weight-for-Height z score (WHZ) $\geq$+3SD] were based on WHO cutoffs.

Data analysis

Data entry was done in Microsoft Excel. The ENA for SMART software was used to compute WHZ, WAZ, and HAZ z scores. Data analysis was done using SPSS version 20. The association between infant feeding practices and stunting in children 6-59 months was analysed using the Pearson's chi- square test. While the independent samples t-test was used to assess associations for continuous variables. The level of significance was set at P<0.05.

Ethical considerations

Approval for this study was obtained from the Medical Research Council of Zimbabwe (MRCZ/B/1421). Permission to collect data was also granted by the District Medical Officer for Mutasa district and Matron in charge of ANC clinic from Mutasa "Mutasa" District Hospital. All participants provided informed consent prior to participation.

RESULTS

Socio-demographic characteristics

The study enrolled 82 children of the age 6-59 months, 48.8% (n= 40) boys and 51.2% (n= 42) girls. The mean±SD age for the children was 23.89±14.47 months, with 58.5% (n=48) of the children in the age group 6-23 months and 41.5% (n=34) in the age group of 24-59 months' age group. **Table 1** shows a summary of the socio-demographic characteristics in relation to stunting. Boys (P=0.019) and higher birth order of the baby (P=0.010) were significantly associated with stunting. Stunting was highest in 24-59 months age group (32.4%) compared to their 6-23 months old (25%) counterparts (P=0.465). Boys were more likely to be stunted than girls (, P=0.019).The fewer the number of children in the household the more likely the child is to be stunted and the lower the birth order the lower the likelihood of stunting around 40% for first and second born vs 10% for third born children.

Table 1: Socio-demographic characteristics of the participants by stunting

Variable		Total (n=82) n (%)	Not stunted (n=59) n (%)	Stunted (n=23) n (%)	[1]P value
Age of child:	6-23 months	48 (58.5)	36 (75)	12 (25)	0.465
	24-59 months	34 (41.5)	23 (67.6)	11 (32.4)	
Sex of child	Boys	40 (48.8)	24 (60)	16 (40)	
	Girls	42 (51.2)	35 (83.3)	7 (16.7)	0.019*
Birth order:	First born	26 (31.7)	16 (61.5)	10 (38.5)	
	Second born	24 (29.3)	14 (58.3)	10 (41.7)	0.010*
	Third born	32 (39.0)	29 (90.6)	3 (9.4)	

Notes: [1]P value for Pearson's Chi-square Test *Association was significant at P<0.05

Nutritional status of children aged 6-59months

Table 2 shows a summary of the nutritional status of children by sex. The results show that stunting was at 28%, overweight and obese 9.8%, underweight was 4.9 % and wasting was at 4.9%. More boys were stunted (40%) and overweight (17.5%) compared to girls whilst more girls were underweight (7.1) and wasted (7.1) to boys.

Table 2: Nutritional status in children 6-59 months by sex

Indicator	Total (n=82) n (%)	Boys(n=40) n (%)	Girls(n=42) n (%)	[1]P value
Stunting, (HAZ <-2 SD)	23 (28)	16 (40)	7 (16.7)	0.019*
Wasting, (WHZ < −2SD)	4 (4.9)	1 (2.5)	3 (7.1)	0.616[2]
Underweight, (WAZ <-2SD)	4 (4.9)	1 (2.5)	3 (7.1)	0.616[2]
Overweight and obesity (WHZ >+2 SD)	8 (9.8)	7 (17.5)	1 (2.4)	0.056[2]

Notes: [1]P value for Pearson's Chi-square Test and [2]P Fishers Exact Test, *Association was significant at P<0.05

Knowledge of IYCF practices among mothers

Table 3 indicates the knowledge on IYCF of the mothers in relation to practice. The results show that 75.6 % of the mothers (n=62) practiced early initiation of breastfeeding and of those that practised early initiation 58.1 % had adequate knowledge on the practice. The rate of exclusive breastfeeding was high at 82.9 %. The majority of the mothers had adequate knowledge of exclusive breastfeeding (95.6%). A few mothers (13.4%) practiced continued breastfeeding to the age of two years or beyond and the majority (81.8%) of them had adequate knowledge about the practice. There was a significant association between knowledge on early initiation of breastfeeding and its practice (P=0.003). This points to the importance of the IYCF lessons to mothers during the ANC sessions at clinics.

Table 3: Nutrition knowledge compared to IYCF practices '

IYCF Practices	Practiced n (%)	Knowledge Adequate n (%)	Deficient n (%)	[1]P value
Early initiation of breastfeeding immediately	62 (75.6)	36 (58.1)	26 (41.9)	0.003*
Exclusive breastfeeding for the first 6 months	68 (82.9)	65 (95.6)	3 (4.4)	0.666
Continued breastfeeding up to 24 months	11 (13.4)	9 (81.8)	2 (18.2)	0.673
Timely introduction of complementary feeding	55 (67.1)	45 (81.8)	10 (18.2)	0.415

Notes: [1]P value based on Pearson's Chi-square Test, *Association was significant at P<0.05

IYCF practices and stunting

Generally, children whose mothers had practiced the recommended infant and young child feeding practices had a lower likelihood of stunting. Although not statistically significant the highest proportion of stunted children were amongst those children that consumed iron rich or iron fortified foods. Table 4 shows the association of feeding practices and stunting.

Table 4: Association of feeding IYCF practices with stunting

Variable	Total (n=82) n (%)	Not stunted (n=59) n (%)	Stunted (n=23) n (%)	[1]P value
Early initiation of breastfeeding	62 (75.6)	46 (78.0)	16 (69.6)	0.160
Exclusive breastfeeding	68 (82.9)	47 (79.7)	21 (91.3)	0.208
Continued breastfeeding up to 24 months	11 (13.4)	8 (13.6)	3 (13.0)	0.690
Timely introduction of complementary feeding	55 (67.1)	39 (66.1)	16 (69.6)	0.764
Consumption of iron rich/iron fortified foods	23 (28)	13 (22.0)	10 (43.5)	0.052

Notes: [1]P value based on Pearson's Chi-square Test, *Association was significant at P<0.05

DISCUSSION

The results of our study show that there was no significant association between stunting and infant and young child feeding practices in children aged 6-59 months in Mutasa District, except for a significant association between knowledge of early initiation of breastfeeding and its practice.

Nutritional status of children aged 6-59 months

Stunting was the leading form of malnutrition in this community, affecting 28% of the children under 5 years. The high stunting rate observed was consistent with the district stunting rate from the national survey results. Our findings show that boys (P=0.019) were significantly associated with stunting. This can be attributed to boys receiving an inadequate intake of their nutritional requirements as they have higher nutrient needs for growth as compared to girls (Mushaphi *et al.,* 2008) (Mushaphi *et al.,* 2008). The results concurred with findings from to the national nutrition survey (ZNNS, 2018) conducted in 2018, which indicated that boys were more stunted than girls and also tallies with other studies done in Africa were more boys are stunted than girls (Matsungo *et al.,* 2017). Lower birth order of the child (P=0.010) was significantly associated with stunting this can be attributed to the tendency of mothers giving priority to younger children with regards to quality and frequency of meals given compared to the rest of the family (Faber *et al.,* 2016). As such younger children had better nutritional status compared to the older children within a household. Stunting was found to be less prevalent (25%) in the age group 6-23 months compared to their 24-59 months (34.2%) counterparts. This is contrary with other studies conducted which showed that stunting usually peaks in age group 6-23 months when complementary feeding starts (Katepa-Bwalya *et al.,* 2015; Matthew *et al.,* 2009).

Knowledge of mothers on IYCF practices

We found that generally, mothers were knowledgeable on most IYCF practices. The Pearson's Chi-squared analysis revealed that in this setting there was a significant association between knowledge and practice of early initiation (P=0.003). We postulate that knowledge is a key driver of IYCF practice and we recommend that mothers should register early and attend regularly ANC sessions where they receive such nutrition knowledge and guidance. Contrary to previous studies conducted in other African settings (Katepa-Bwalya *et al.,* 2015; Matthew *et al.,* 2009). The rate of exclusive breastfeeding was notably high (82.9%) above the WHO global minimum target of 50% (WHO/UNICEF, 2018). Mothers who had not exclusively breastfed their children gave water as a remedy for assumed thirst in children before the age of 6 months. Continued breastfeeding to the recommended 24 months or beyond was very low (13.4%) as mothers believed that prolonged breastfeeding would render the child retarded. Knowledge on IYCF practices was acquired from counselling and education sessions conducted in the communities by the village workers and at the hospital by health workers. Despite the education received some mothers failed to put the knowledge to practice due to cultural beliefs and for others lack willingness.

Feeding practices and stunting

Contrary to other studies (Tessema *et al.,* 2013) that found a significant association between feeding practices and stunting. The study results showed an insignificant relationship between stunting and infant and young child feeding practices. There is a high probability that some of the mothers could have responded to questions according to known recommendations rather than what they practiced since interviews were conducted within a health institution. Consumption of iron rich/iron fortified foods showed the closest association with stunting.

CONCLUSIONS

There was high stunting prevalence, there was no significant association between stunting and IYCF knowledge and practices. The prevalence of stunting was significantly higher in boys compared to girls (P=0.019). Although not significant, stunting was highest in age group 24-59 months compared to 6-23 months category (P=0.465). In addition, the results showed that higher the birth order the higher the likelihood of stunting (P=0.010). There was a significant association between knowledge on early initiation of breastfeeding and its practice (P=0.003). Therefore, ongoing multisectoral community based stunted reduction initiatives should be strengthened in this and related settings.

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