

Childcare practices and nutritional status of children aged 6–36 months among short- and long-term beneficiaries of the Child Survival Protection and Development Programmes (the case of Morogoro, Tanzania)

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Abstract

A comparative cross-sectional study was carried out to compare childcare practices and nutritional status of children aged 6–36 months in Mwembesongo and Mjimpya wards that had long and short experiences respectively with the Child Survival, Protection and Development (CSPD) programme. The purpose of the study was to establish whether the long-term implementation of the CSPD programme had an impact compared to that of a short-term programme. The findings showed that the children from Mwembesongo were exclusively breast-fed for a significantly longer period (50 days) than those in the Mjimpya ward (32 days) and that significantly more mothers (95.7%) in Mwembesongo than in Mjimpya (84.5%) attended growth monitoring programmes. On the other hand, significantly more mothers in Mjimpya (71.5%) compared to those in Mwembesongo (51.8%) breast-fed immediately (less than one hour) after birth. The study revealed that there was no significant difference in children's nutritional status (wasting and underweight) between the two wards, except for stunting. More children in Mwembesongo (39.7%) than in Mjimpya (27.5%) were stunted. The findings have demonstrated that financial capacity to support children's food and care requirements forms a springboard from which to launch additional efforts for improved nutritional status.

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Introduction

Adequate nutrition is a basic right, but globally it remains unmet for many under-five-year old children. This has resulted in over 200 million children with malnutrition in developing countries, and contributes to more than half of the twelve million deaths of under-five-year old children that occur in each year.¹ UNICEF estimated that 190 million under-five-year old children in developing countries are chronically malnourished and are trapped early in life in patterns of poor health and development.² In Tanzania, for example, three national surveys showed that the prevalence of stunting among children less than five years old has remained at 43–44%.³

In Morogoro Municipality, the CSPD programme was launched in 1988 in the Mlimani ward with the objective of improving the welfare of women and children. By 2001, the programme was operational in all 19 wards of Morogoro municipality. In Mwembesongo and Mjimpya wards, the programme was initiated in 1992 and in 2001 respectively.

Despite the many nutritional studies that have been conducted in Morogoro Municipality, little is known about attributes of childcare practices that are associated with nutritional status of young children. More importantly, there is no documentation on whether prolonged experience has advantages compared to experience over the short term. This study, therefore, intended to illustrate the childcare practices that contribute to nutritional status among infants and young children (6–36 months) in Morogoro in the context of the co-existence of the long- and short-term CSPD programme. By demonstrating differences between the Mwembesongo and

Mjimpya wards, the study aimed at capturing the influence of the programme and to yield data that would be useful for improved nutrition programming.

Materials and Methods

Sample size and sampling procedure

Using Fisher et al's formula for comparative studies,⁴ a sample size was determined. Subsequently, a multistage sampling approach was applied to obtain the eligible households. The second level comprised random sampling of one ward in each category – a process that yielded Mwembesongo and Mjimpya as the wards hosting long- and short-term beneficiaries respectively. Simple random selection was used to elicit the study sample: each composed of 164 households, hence a total of 328 households.

Data collection

Structured questionnaires were directly administered to mothers/caregivers. Observations were made on general cleanliness of both the caregiver and the child. Length/height and weight were measured and the gender of the child was recorded. Guidelines for key informants and focus group discussions were also used. Quantitative dietary measurement was done for all foods consumed by the children.^{5,6}

Data quality control

Various data quality enhancing strategies that included; use of personnel who were well trained in data collection techniques,

pre-testing of questionnaires, the verification of the relevance of the tools, and data cleaning were used to optimise the validity and reliability of data.

Data analysis

Anthropometric data were analysed by Epi-Info (Version 6), and used to classify children into levels of nutritional status as recommended by the World Health Organisation.^{7,8} Other data were analysed by SPSS (Version 11). Data on 24-hour recall was converted into nutrients using food tables by Sehmi.^{9,10}

Results

Profile of the study children

A sample consisted of 164 and 165 households in Mwembesongo and Mjimpya wards respectively. The mean ages of the study children were 18.6 ± 8.8 months (CI 17.3–20) and 19.5 ± 9 months (CI 18.1–19) in Mwembesongo and Mjimpya wards respectively. The difference in age was not significant (t-test = -0.896; df = 326; p = 0.371). The mean number of children under the age of five years per household was 1.8 in Mwembesongo and 1.9 in Mjimpya. The mean age difference between the index child and the immediate older one was 45.7 ± 11.7 months with the range of 24–20 months in Mwembesongo and 49.8 ± 14.1 months with the range of 27–126 months in Mjimpya. This difference was not significant (t-test = 27.2; df = 151; p = 0.601). The mean age difference of the index child to the immediate follower was 15.7 and 13.7 months in Mwembesongo and Mjimpya respectively. No significant difference was observed (t-test = 1.511; df = 5; p = 0.191). These findings indicate that the children in both groups were similar in age and in the spacing between them and the younger and the older child.

Feeding practices

At the time of the study, 61.6% children in Mwembesongo and 55.8% in Mjimpya were still being breast-fed ($\chi^2 = 12192$; p = 0.678). Significantly more mothers in Mjimpya (71.5%) than in Mwembesongo (51.8%) initiated breast-feeding immediately (less than one hour) after birth ($\chi^2 = 10.472$; p = 0.001). Less than half (43%) of the mothers in Mwembesongo and 25% in Mjimpya ward initiated breast-feeding between one to five hours after birth. Only 4.9% in Mwembesongo and 3.6% in Mjimpya initiated breast-feeding more than five hours after birth. The following distribution of index children by age groups was used: 6–12, 13–24 and 25–36 months – in Mwembesongo 18.9%, 42.1% and 39% respectively, and in Mjimpya 22.2%, 43.8% and 34.0%.

Almost half of the mothers (49%) in both wards reported giving children prelacteal fluids before initiating breast-feeding. Furthermore, most children from Mwembesongo and Mjimpya wards (94.2% and 97.5% respectively) were introduced to complementary food when they were less than four months old. There was a significant difference between the two wards in the duration that the children were exclusively breast-fed: a mean of 50 days in Mwembesongo compared to a mean of 32 days in Mjimpya (t-test = 2.918; df = 256; p = 0.004). The main reason for introducing complementary food was that children cried frequently, which was reported by 50.4% of mothers in Mwembesongo and 57.9% in the Mjimpya ward.

Of the children studied, 61.9% in Mwembesongo and 63.9% in Mjimpya were breast-fed for a mean of 21.2 months (SD ± 4.5) and 20.9 months (SD ± 4.5) (with minimum periods ranging between 9 and 31 and 9 and 32 months) in Mwembesongo and Mjimpya wards respectively. No significant difference was observed for the age at which breast-feeding was stopped between the two wards (t-test = 0.347; df = 129; p = 0.729). In both wards, there was no association between breast-feeding duration and nutritional indices. Table I summarises the type of food given as prelacteals, exclusive breast-feeding status and reasons for introducing complementary food.

Table I: Percentage distribution of children by feeding practices

Component	Mwembesongo	Mjimpya	χ^2	p value
	n = 164	n = 165		
Type of the food given before initiating breast milk				
Warm water	82.4	89.3		
Porridge	1.4	4.8		
Water with sugar	16.2	6	5.513	0.064
Exclusive breast-feeding duration				
< four months	94.2	97.5	1.709	0.191
≥ four months	5.8	2.5		
Reasons for introducing complementary food				
Baby crying when he/she sees people eating	59.4	56.7		
Mother did not have enough milk	29.9	27.4		
Other ^a	20.7	15.9	2.064	0.356

^a = Mother resumed work, sick, advice, decision of the mother.

The children were similar when the two groups were compared regarding the mean number of meals taken by the children per day, as there were insignificant differences (t-test = 1.679; df = 325; p = 0.094) with an average of 3.3 ± 0.6 and 3.4 ± 0.7 meals per day in the Mwembesongo and Mjimpya wards respectively. Table II summarises the number of meals given according to the age of the child.

Table II: Summary of number of meals given according to age of child

Age	Mwembesongo		Mjimpya		Mwembesongo		Mjimpya		p value
	1–3 meals	4–6 meals	1–3 meals	4–6 meals	n	%	n	%	
6–12 months	34	29.3	19.1	9	23	21.7	13	23.2	
13–24 months	53	45.7	51.1	24	45	42.5	26	46.4	
25–36 months	25	25	29.8	47	38	35.8	17	30.4	0.593

The mean energy intake in Mwembesongo was 894.9 ± 262.6 kcal and 1020.5 ± 286.8 kcal in the Mjimpya ward. Closer to one-third (30.3%) of the households in Mwembesongo and 45.5% in Mjimpya wards did not meet the recommended daily allowance (RDA) for calories. Mwembesongo had an average protein intake of 49.1 ± 11.3 g whereas Mjimpya ward had an average of 54.7 ± 70.1 g. A few households (10.7% and 6.3% from Mwembesongo and Mjimpya wards respectively) did not meet the protein RDA.

No significant differences in the mean caloric intake (t -test = -0.972; df = 52; p = 0.336) or protein intake (t -test = 0.976; df = 25; p = 0.337) were found.

Healthcare practices

Almost all mothers (99.7%) from both wards reported attending antenatal clinics. The delivery process for most of the index children from Mwembesongo (97%) and Mjimpya (93%) were assisted by doctors or trained nurses. A small proportion of the mothers from both wards were assisted by traditional birth attendants.

Water use

Almost all the households (97.6%) in both wards used piped water, with an average daily consumption of 87.1 litres (n = 120) and 81.1 litres (n = 81) of water for the participants in the Mwembesongo and Mjimpya wards respectively. The mean household size in the Mwembesongo and Mjimpya wards was 4.0 and 4.2 people respectively. The recommended standard per capita water required in a day is 20 litres. More than half (64.6% and 60.5%) of the households from Mwembesongo and Mjimpya wards respectively reported to have adequate water. A significantly higher proportion of households in Mwembesongo (56.7%) than in Mjimpya (41.2%) reported that they used boiling as a way of treating water for drinking.

Identification of caregivers

Mothers were the principal caregivers in the Mwembesongo (92.7%) and Mjimpya wards (94%). Almost all fathers from both wards were not involved in care-giving activities; however a few fathers from Mjimpya (1.8%) were involved in encouraging the children to eat as well as in changing their clothes. Approximately 4.3% and 1.2% of the alternative caregivers from Mwembesongo and Mjimpya respectively were siblings of the index child. These siblings were mostly involved in the stimulation of psychomotor skills, such as playing with the child and teaching skills.

Nutritional status of the study children

The prevalence of wasting and underweight was not associated with the duration of the CSPD programme, but stunting was found to be significantly higher among children whose households had participated in the programme over a long duration. Table III shows the distribution of the study children by nutritional status.

Table III: Nutritional status of the study children

Nutritional indices	Mwembesongo n = 164		Mjimpya n = 165		p value
	n	%	n	%	
Stunting	64	39.7	46	27.5	0.0275s
Underweight	31	18.9	26	16.2	0.5629ns
Wasting	9	5.6	7	4.3	0.6082ns

s = significant at $p < 0.05$; ns = not significant

Association between childcare practices and nutritional status

The children who were not immunised had a higher prevalence of underweight (75%) compared to those who were immunised (18.5%) (p = 0.013).

The prevalence of wasting was higher among the children who were not attending growth monitoring programmes (12%) as compared to those who were attending (2%) in both wards (p = 0.041).

Relationship between WAZ score, age of the child, breast-feeding duration and father's financial support

In the Mwembesongo and Mjimpya wards respectively, WAZ scores increased with financial support and breast-feeding duration while it decreased with child age (f -test = 5.634, p = 0.001 and f -test = 8.0963, p = 0.000 respectively). In addition, children who received full financial support from their fathers in Mwembesongo and Mjimpya respectively had a higher WAZ (-0.94 and -0.98) compared to those who received partial (-1.36 and -1.21) or no support (-1.75 and -1.39).

Relationship between HAZ score, age of child, breast-feeding duration and father's financial support

In both wards, HAZ scores increased with the financial support from the father and breast-feeding duration while it decreased with child age (f -test = 6.432; p = 0.000 in Mwembesongo and f -test = 6.157; p = 0.001 in Mjimpya). In addition, children who received full financial support from their fathers in Mwembesongo and Mjimpya respectively had a higher HAZ score (-1.52 and -0.77) compared to those who received partial (-2.21 and -1.38) or no support (-2.32 and -1.78).

Discussion

General care practices

A substitute caregiver of the child in the absence of the mother could be an equally important determinant of the nutritional status of the child. This study has established that the possibility of a child becoming malnourished in both wards is not associated with the age of the alternative caregiver. Almost all wasted children from the study area were carried by their mothers to wherever they were going. The study contradicts other findings^{11,12} which showed an association between care giving by pre-teens and reduced food intake leading to poor nutritional status of the children. The main input of the fathers in childcare was financial, i.e. the provision of food, clothing and taking care of medical expenses. To a lesser extent, fathers from Mjimpya were also directly involved in childcare activities, such as discouraging children from eating dirt or encouraging them to eat food, and washing their children and their clothes.

The household size was associated with the length of time the mother spent with the child. This may be explained by the fact that, as the family size increases, the time she spends on caring for the child diminishes as most roles are assigned to other family members. The positive correlation of the mothers' occupation with the time allocated to the children confirms that mothers' occupation had an effect on childcare.¹³ However, in both wards these variables were not predictors of wasting and underweight.

Breast-feeding and complementary feeding practices

Breast-feeding practices are of crucial importance in infant nutrition. The study established that more children from Mjimpya were breast-fed immediately (less than an hour) after birth than in Mwembesongo. This suggests that the CSPD programme, being fairly new in Mjimpya, was more aggressively advocating immediate initiation of breast-

feeding among its beneficiaries than in Mwembesongo. However, the difference in time of initiating breast-feeding showed no significant association with nutritional status.

Approximately half of the children from both wards were given prelacteal fluids (sweetened/unsweetened water, porridge). This is an inappropriate practice that should be discouraged because it might interfere with the milk let-down process and may expose babies to infection. The risk in this may be embedded in the exposure to the use of contaminated food and feeding utensils, as a result of inadequate facilities in the household and poor hygienic practices in the preparation of these feeds.

The timing of the introduction of complementary food in addition to breast milk has important implications for the health of the child. Thus, while the practice of exclusive breast-feeding for up to six months of age is considered beneficial, additional food prior to this age is considered to have no added advantage. After the age of six months, breast milk alone can no longer satisfy the child's increased physiological requirements for energy and specifically for macro- and micro-nutrients; therefore, other food to complement breast milk should be given. However, the findings from this study showed that the early introduction of other food to the child, apart from breast milk, is a common practice in both wards. The explanation given by respondents was that most of the children continued crying even after breast-feeding. Early introduction of complementary food has already been documented in Tanzania^{3,14} and in other countries such as Zimbabwe and Latin America.¹³

It has been established that most children from both wards received one to three meals a day. This can be explained by the fact that most children were eating from the family meals, which are prepared three times a day. Similar findings in Ethiopia documented by Abate et al¹⁵ showed that most children received one to three meals a day. In addition, many study children were still breast-fed, probably complemented with food intake. However, the study did not take into account the intake of breast milk. The results of the study revealed breast-feeding termination from both wards was highest between one and two years. This agrees with other findings in Tanzania by TRCHS³ and Luboya¹⁶ and in Kenya.¹⁷ The findings indicated that many households from Mwembesongo and Mjimpya took less than the recommended energy daily allowance. This may be attributed to a high intake of complementary food that is based on cereals or tubers commonly prepared as gruels with low energy and nutrient density, combined with the frequency of feeding. Comparable bulky food complementation was reported by Mosha and Vicent,¹⁸ and Abate et al.¹⁵ Protein intake was found to be high in both wards. However, there was no significant relationship observed in both wards between caloric as well as protein intake and children's nutritional status.

Child immunisation and morbidity

In order to ensure that infants and young children have a healthy start in life, it is essential to immunise them against communicable childhood diseases such as polio, measles and tuberculosis before their first birthday. High attendance of mothers at maternal and child health (MCH) clinics in both wards was observed. This is probably due to the close proximity of the clinics offering child health services to the households as well as the client-friendly frequency (available

every day) at which they were offered. The indication is thus that close proximity of services and services provided at times that suit clients and offered by friendly staff encourage service utilisation. This concurs with a similar finding by UNICEF¹⁹ in Tanzania. As established by studies carried out in other regions of Tanzania^{16,20} the incidence of illnesses such as fever/malaria, cough, cold/flu and diarrhoea is high among the study children.

In spite of the Mwembesongo ward having been in the CSPD programme for nine years, the prevalence of stunting was higher than in the Mjimpya ward, which has been in the programme for only a year. This suggests that the long-existing programme could have been experiencing diminishing returns.

Relationship between mother's education and child's nutritional status

From the findings it has been observed that the education of the mothers was a determinant of the nutritional status of the children. This concurs with the findings of other studies that suggest association between maternal years of schooling and children's nutritional status.²¹ No significant differences in nutritional status between the sexes were found, contradicting other studies.^{15,21,22} In comparison with the national status reported in 1999¹⁴, the study has shown improvement in the nutritional status of children.

Lessons learned

- Despite many years of effort put into promoting exclusive breast-feeding (for up to six months), approximately 95% of the mothers exclusively breast-fed for less than four months. The existing practice indicates that mothers need help with both prolonging and sustaining the duration of breast-feeding to the desired age.
- Programmes have lifespan thresholds beyond which there is no commensurate advantage.

Good practices

- The mothers fed the children colostrum.
- Having service provision points within close proximity of users coupled with frequency beyond once a week enhances attendance of growth monitoring programmes and completion of the immunisation schedule.

Conclusion

The study established that mothers are the principal caregivers in both wards. In cases where the mother is away, siblings, maids and other people like neighbours, aunts and grandmothers are involved in taking care of the child while fathers are the least involved in care giving. Several childcare practices are similar in both wards. The few childcare practices that are different in the two wards include time of initiating breast-feeding after birth, exclusive breast-feeding duration, boiling of water for drinking, and growth monitoring programme attendance. The study led to the following conclusions:

The fact that the level of stunting in Mwembesongo was significantly higher than in Mjimpya suggests that long-term programming is not necessarily advantageous for children's nutritional status, such as stunting, of which alleviation is dependent on the reduction of poverty at the household level. The findings also suggest that the timing of initiation and the total duration of breast-feeding contribute towards

protecting children against stunting and wasting while the time mothers spend with their children contributes to protection against stunting. In comparison with the short-term group, the one with long programme experience had a significantly longer breast-feeding duration, participated more in the growth monitoring programme and more households boiled their drinking water. The findings have also demonstrated that financial capacity to support children's food and care requirements forms a springboard from which to launch additional efforts for improved nutritional status. This affirms that nutrition security will benefit from inputs towards the millennium goals to target poverty reduction.

The study findings did not detect any nutritional advantage of longer exposure to the CSPD programme compared to shorter exposure. This is an indication that a threshold probably exists beyond which CSPD programme activities stop yielding additional value. In comparison with the short-term group, the one with long programme experience had a significantly longer breast-feeding duration, participated more in the growth monitoring programme and more households used boiled water. This suggests that programme monitoring systems should be adequately developed to detect both the stalling in the level of benefit and the affected dimensions for appropriate re-engineering of a programme approach.

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