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ORIGINAL RESEARCH

Influence of Households' Socio-Economic and Demographic Characteristics on Morbidity and Nutritional Status of Preschool Children in Ganze- Kilifi County, Kenya

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ABSTRACT: Globally, socio economic and demographic status of households have been shown to influence the health of school children. However, knowledge of the impact of these factors on children's health is scarce in Kilifi County. This study evaluated the influence of households' socio-economic and demographic characteristics on Preschool children's morbidity and nutritional status in Ganze Kilifi County, Kenya. A total of 288 pre-school children (3-5 years) and their households were selected from ten Government schools five which had a school lunch programme (study group) and five without the programme (Control group) but in the same locality. Households' socioeconomic and demographic data was collected by trained research assistants using pretested questionnaires. WHO Anthro programme was used to evaluate children's nutritional status and SPSS version 24, and SAS version 9.4 statistical software for Data analysis. The threshold for statistical significance was set at $p<0.05$. Household heads with no formal education were 30% and the average income of the households was KES. 3000-5000 per month. Households' average daily allocation to food was Kes.100-150. Children enrollment in preschool was 65% for boys and girls 35%. Children who were sick two weeks, prior to the interview were 2 times more likely to be stunted [OR=2.20; 95%CI=1.25 - 3.85; P=0.006] and 2.5 times more likely to be underweight [OR=2.66; 95%CI=1.48 - 4.77; P=0.001] compared to children without sickness. This study found that socio economic and demographic factors influenced morbidity and nutritional status of the preschool children. The study showed that the long distance to health services, low education level and income contributed to increased ill health and morbidity resulting into stunted and underweight children. The study recommends that the relevant authorities should improve access to clean water and sanitation in addition to community health outreach services targeting the children. Also, the community should be supported and encouraged to engage in income generating activities for economic empowerment.

Key Words: households, morbidity, nutritional status, preschoolers, socio-economic status.

INTRODUCTION

Globally, childhood malnutrition is a major problem leading to increased morbidity and mortality in children below 5 years of age. Recent report by WHO indicate that among the preschool-age children, 55 million were wasted, of whom about 40million were moderately acutely malnourished (28). In Kilifi County child malnutrition has been a problem and high cases of severely malnourished children being admitted annually in the County hospital. The Kenya Demographic Health Survey 2014 report indicated that 39% of children under five years of age in Kilifi County were stunted, 4.1% wasted and 16.9% underweight. (14, 23).

Socioeconomic and Demographic characteristics of the households including age, sex, occupation, religion, education level, income level, marital status and average size of the family have been established as direct influencers of children's health and nutritional status (1–4, 11). This study purposes to identify the factors associated with the morbidity and poor nutritional status among preschool children in Ganze, Kilifi County. The area is semiarid area occasioned by erratic rainfall, inadequate food production with high levels of malnutrition and poverty. A school lunch programme has been introduced in some schools in the most vulnerable areas to help mitigate the problem.

In the developing world, especially in Sub-Saharan Africa it is widely recognised that child morbidity is influenced by socio economic, demographic and environmental factors such as water source, toilet facility and type of housing. High level of morbidity among children under five years is associated with low socioeconomic status, low level maternal education and poor housing. (25).

Malnutrition status is attributed to poverty within the households which is mostly associated with illiteracy, low economic status, insecurity and drought (5–7). A study on urban informal settlements in Kenya has shown a significant association between low income and child stunting (3). A similar link between stunting and the economic status of household was also noted in studies carried out in Uganda and Bangladesh (9–11).

Ages of maternal caregivers have been closely associated with the nutritional status within a household (18). Some studies have found a high prevalence of stunting among children below sixty months among the young mothers below 31 years. The older mothers (above 31years) were found to have gained experience of taking care of their children and hence have more knowledge of nutritious foods resulting to lower records of stunting (15).

Household sizes also have been found as a major determinant on the ability of the caregiver to provide nutritious foods to the vulnerable young children below five years. Larger household sizes are associated with poor rural families who in most cases lack regular income hence low uptake of food rich in nutrients. Children living in households with more than seven family members have higher likelihood of being stunted as compared to those living in households with four or less family members (16,17).

Gender of the head of the family or that of a caregiver has also been established by some studies from different global regions as having mixed influence on the nutritional status of children. Cases of stunting have been significantly associated with the gender of the household's head or that of its caregiver(18). Female headed households have higher cases because the level of income is inadequate due to their low earning as compared to the male headed households (19).

METHODS

This was a cross sectional study involving 288 pre-school children (3-5 years) and their households which was carried out as baseline assessment in a project evaluating the effect of feeding programme on preschool children health and nutritional status. The children were selected from 10 primary schools with Early Childhood Development centres. Five of the schools had a Government sponsored school lunch programme and five without the programme but within the same locality. The five (5) centers with school lunch programme (Study group) were purposively selected based on their good record in the management of the programme. The five (5) schools with no programme (Control group) were chosen based on their proximity to those with the feeding programme to allow for recruitment of a homogeneous study group. Thirty children were targeted from each school selected but some schools had fewer children within the age of 3-5 years. The study group had 146 and control group 142 children. Ethical clearance was obtained from National Council for Science and Technology Ethical Committee. Consent was also obtained from the participants mainly the guardians before enrolling them and the children in the study.

A semi structured pre-tested questionnaire based on standardized validated tools adopted from the Kenya Demographic and Health Survey (20) was used to collect households Socio- economic and demographic data. Pre-testing of the research tools was conducted among a population similar to the study population and the recommendations from the pre-test were used to carry out the required adjustments.

The assessment parameters included the guardians' marital status, formal education level, and occupation of the household head, monthly income and amount allocated to daily food purchase. Household sanitation status including water supply, availability of toilet facility, and treatment of water for drinking; and common cooking fuel were also evaluated. Access to health services and morbidity status among the children in the study were also assessed.

The children's anthropometric measurements were taken using a UNICEF height board for height and portable SECA digital weighing scale for weight. The children's age was obtained from the guardians and confirmed using child growth monitoring clinic card. The weight for height, weight for age and height for age indices were generated using WHO Anthro programme and compared with International standard reference values. Three indexes of malnutrition including stunting, wasting and underweight were determined among the study children (28). The nutritional indicators data was combined with demographic and socio-economic data for analysis and tabulation using descriptive statistics. Association between households' demographic and socio-economic characteristics and children morbidity and nutritional status were determined using the Pearson Chi square test. Binary logistic regression model was used at multivariate level to determine the factors associated with morbidity and nutritional status among the preschool children.

RESULTS

Demographic characteristics of the Households

This study found that 86% of the guardians were female 20-39 years old. The study noted that 30% of the guardians had no formal education and only 9% had attained post primary education as shown in

Table 1

Table 1: Demographic Characteristics of the Households

	Study group (n=146)		**Control group (n=142)**		**χ^2 value**	
Variables	**n**	**%**	**n**	**%**		**P value**
Age of guardian						
20 – 29	55	37.7	69	48.6	3.91	0.417
30 – 39	70	48.0	59	41.6		
>40	21	14.4	14	9.9		
Gender of Guardian						
Male	21	14.4	17	12.0	0.37	0.545
Female	125	85.6	125	88.0		
Marital status of HH						
Not married	14	9.7	20	14.1	8.19	0.085
Married	132	90.3	122	85.9		
Level of education						
No formal schooling	40	27.4	44	31.0	3.44	0.633
Primary	95	65.1	89	36.7		
Post primary	11	7.5	9	5.3		
Household members						
Less than five	49	33.5	51	35.9	1.88	0.391
Five to Seven	54	37.0	49	34.5		
Above Seven	43	29.5	42	29.6		

Socio-economic characteristics of the households

The economic activities as shown in **Error! Reference source not found.** indicate that most of the household heads were involved in unskilled labour while a few were in small business (hawking, tailoring, vegetable and fish venders). Those in formal employment were engaged as security guards, school messenger's local health

centres support staff and ECD centers teachers. The farmers were involved in small scale farming of subsistence crops mainly maize and cassava. The average monthly income for most households was between Kes 3,000 and 5,000 and the average amount allocated to food per day by households was 100-150 Kes.

Table 2: Socio-Economic Characteristics of the Guardians

	Study group (n=146)		Control group (n=142)		χ^2 value	
Variables	**n**	**%**	**n**	**%**		**P value**
Household head occupation						
Formal employment	17	11.6	20	14.1	3.36	0.526
Farming	11	7.5	12	8.5		
Small business	49	33.6	46	32.3		
Unskilled labour	69	47.3	64	45.1		
Monthly income						
1000-2999	20	13.7	15	10.6	1.00	0.910
3000-4999	85	58.2	84	59.2		
>5000	41	28.1	43	30.2		
Source of Food						
Purchase only	45	30.8	37	26.1	3.33	0.500
Purchase/farming	101	69.2	105	73.9		
Daily food allocation (Kes)						
< 100	31	21.2	38	26.8	2.44	0.486
100-150	85	58.2	69	48.6		
>150	30	20.6	35	24.6		

Household water source, sanitation, cooking fuel and access to health facility

Majority of the households obtained water from a community water point or water pans where water collected during the rainy seasons. Water treatment was carried out by only 15% of the households and more than 50% of the households had no toilet facility. Common cooking fuel by over 90% of the household was firewood. Access to health facility show that some households were more than 20km. The Households' water sources, sanitation, cooking fuel and distance to health facility is shown in table 3.

Table 3: Household water source, sanitation, cooking fuel and access to health facility

	Study group (n=146)		Control group (n=142)		χ^2	
Variables	**n**	**%**	**n**	**%**	**value**	**P value**
Source of household water						
Household piped water	11	7.5	7	4.9	2.90	0.064
Vended piped water	90	61.2	85	59.9		
Pan/ pond water	45	31.3	50	35.2		
Water treatment						
Yes	20	13.7	25	17.6	2.84	0.092
No	123	86.3	117	82.4		
Availability of Toilet facility						
Yes	65	44.5	63	44.4	2.39	0.523
No	81	55.5	79	55.6		
Type of cooking Fuel						
Firewood	135	92.5	136	95.8	5.22	0.157
Others (parafin, gas, charcoal)	11	7.5	6	4.2		

Distance to the health facility						
<10 kms	82	56.2	90	63.4	1.56	0.212
>10kms	64	43.8	52	36.6		

Children's demographic characteristics and morbidity level

More than half of the children (64%) enrolled in ECD centers were male and majority were at age of 41- 50 months. Common ailments among the children in the study included cough, fever, diarrhea and malaria; the most prevalent ailment observed was coughing and fever as summarized in

Table **4**.

Table 4: Children demographic characteristics and morbidity level

Variables	**Study group (n=146)**		**Control group (n=142)**		**χ^2 value**	**p value**
	n	%	n	%		
Sex of child						
Female	59	40.4	51	35.9		
Male	87	59.6	91	64.1	0.62	0.432
Age of the child in months						
36 – 40	33	22.6	44	31.0		
41 – 50	113	77.4	98	69.0	2.58	0.106
Diagnosed with the disease						
No	69	47.3	51	35.9		
Yes	77	52.7	91	64.1	3.81	0.051
Diarrhea						
No	128	87.7	130	91.6		
Yes	18	12.3	12	8.4	1.16	0.281
Cough						
No	66	45.2	68	47.9		
Yes	80	54.8	74	52.1	0.21	0.648
Fever						
No	53	36.3	41	28.9		
Yes	93	63.7	101	71.1	1.81	0.179
Malaria						
No	130	89.0	124	87.3		
Yes	16	11.0	18	12.7	0.20	0.652
Deworming treatment						
No	122	83.6	115	81.0		
Yes	24	16.4	27	19.0	0.34	0.567

Factors associated with children's morbidity and nutritional status

Distance to the health facility was identified as one of the factors associated with stunting whereby children leaving more than ten kilometres from the health facility were two times more likely to be stunted as compared to those living at a shorter distant as shown in Table 5.

Table 5: Factors associated with stunting among children

Variable	OR	95% CI		p value
		Lower	Upper	
Distance to the health facility				
< 10 Kms	Ref.			
>10 Kms.	2.01	1.12	3.58	**0.019**
Cough in the last two weeks				
Yes	2.20	1.25	3.85	**0.006**
No	Ref			

Lack of access to medical care was identified as a factor associated with poor nutritional status whereby children not taken for medical care had higher cases of wasting compared to those to those with access to medical care. This is illustrated in Table 6.

Table 6: Factors associated with wasting among children

Variable	OR	95% CI		p value
		Lower	Upper	
Full model				
Cough in the last two weeks				
Yes	1.35	0.68	2.67	0.398
No	Ref			
Fever in the last two weeks				
Yes	1.57	0.75	3.31	0.233
No	Ref			
Child taken for medical attention				
Yes	Ref			
No	1.45	0.73	2.87	0.293
Reduced model				
Child taken for medical attention				
Yes	Ref			
No	2.00	1.13	3.54	**0.017**
CI = Confidence interval; OR = Adjusted odds ratio; Ref= Reference				

Illness was identified by this study as a factor associated with underweight among the preschool children. Children having a cough were found to have higher cases of underweight compared to those not having a cough. This is illustrated in Table seven.

Table 7: Factors associated with underweight among children

Variable	OR	95% CI		p value
		Lower	Upper	
Full model				
Source of domestic water				
Household piped	1.03	0.33	3.25	0.958
Vended piped/water ponds	1.94	0.97	3.86	0.061
Vended piped	Ref			
Cough in the last two weeks				
Yes	2.44	1.35	4.41	**0.003**
No	Ref			
Reduced model				
Cough in the last two weeks				
Yes	2.66	1.48	4.77	**0.001**
No	Ref			

CI = Confidence interval; OR = Adjusted odds ratio; Ref= Reference

DISCUSSION

Majority of the respondents in this study were women. This is expected in a rural community where culturally women have the role of taking care of children (21). A related study supporting these findings noted that women were more involved in child care in every society and more so in the rural areas (22). However, female-headed households are the most vulnerable economically as they are generally disadvantaged in terms of land, labour, income and other services leading to high cases of undernutrition (21). Most households in this study were male headed but the economic status was still low.

The average household membership of seven members was higher than the national average household membership of four members (20) but there was no significant relationship identified between the family size and the children's health. Other studies have reported that children in households with more than four members were more likely to be stunted as compared to those living in households with two to four family members (16,17).

The illiteracy level was high with 30% of the guardians having no formal education compared to the National level at 10% (7% female& 3% male) (20). This may have affected the level of income as the main source of livelihood for most households was casual labor at 46% compared to the National casual labor percentage of 10% (20). This translated to low income of about one dollar per day contributing to poor purchasing power and ability to meet basic needs like food and health care. (5)

According to the Kilifi County Development Plan less than half (48%) of Kilifi County population have access to piped water (23). This is lower than the national level of 66.9% households with piped water. In Ganze, this study noted that less than 10% of the households had piped water and majority of the population depend on vended water from community water points or rain water collected in man made water ponds. Poor water sources are an indication of poor sanitation which is associated with sickness leading to malnutrition among children (20).

This study found that 90% of the households in Ganze depended on firewood as the main cooking fuel. This has been shown in other studies to be common in rural areas of low-income countries and in most cases it is associated

with respiratory infection among children(25,26). This could have been a contributing factor since the most prevalent ailment among the preschool children in this study was respiratory in nature with majority of the children having chronic cough and fever. Children having a cough two weeks prior to the interview were 2 times more likely to be stunted [OR=2.20; 95%CI=1.25 - 3.85; P=0.006] and had 2.5 times chances of being underweight [OR=2.66; 95%CI=1.48 - 4.77; P=0.001] compared to children without the cough.

The long distance to the health facility and poor access to health services were also contributing factors to poor nutritional status. The study noted that children leaving more than 10kms and those not taken for medical attention were 2 times more likely to be wasted [OR=2.00; 95%CI=1.13 - 3.54; P=0.017] compared to children who were taken for medical attention. This has been shown by a number of studies as a major risk factor to children's health whereby caretakers are not able to seek health services for their children due to the time taken and cost when health facilities are a long distance away from their homes (27–29, 10). The WHO recommends an optimum distance of five kilometers or less to a health facility for the same reasons (28). The low socioeconomic status of this study households could have contributed to the poor access to health care for the children. Other studies have also found a strong association between poor health and children's households' social economic status (10,17,30,31).

CONCLUSION AND RECOMMENDATION

This study found that socio economic and demographic factors influenced morbidity and nutritional status of the preschool children. The study showed that the long distance to health services, low education level and income contributed to increased ill health and morbidity resulting into stunted and underweight children. The study recommends more effort by the relevant authorities to improve health care services, access to clean water and sanitation. The community should also be supported and encouraged to engage in income generating activities and food production for economic empowerment and food security.

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REFERENCES

1. De Pee S, Bloem MW. Current and Potential Role of Specially Formulated Foods and Food Supplements for Preventing Malnutrition among 6- to 23-Month-Old Children and for Treating Moderate Malnutrition among 6- to 59-Month-Old Children. Food Nutr Bull. 2009 Sep;30(3_suppl3):S434–63.
2. Mutua NM, Wakoli DAO, Mueni AB. Factors Associated With Increase in Undernutrition among Children Aged 6-59 Months in Kamoriongo Village, Nandi County, Kenya. Int J Acad Res Reflect. 2015;3(2).
3. Omomdi D., Kirabira P. Socio-Demographic Factors Influencing Nutritional Status of Children (6-59 Months) in *Obunga* Slums, Kisumu City, Kenya. Public Heal Res. 2016;
4. Mahgoub SEO, Nnyepi M, Bandeke T. African journal of food, agriculture, nutrition, and development. Rural Outreach Program (ROP) www.ropkenya.org; http://www.ajfand.net/Index.html; 2006.
5. Bain LE, Awah PK, Geraldine N, Kindong NP, Sigal Y, Bernard N, et al. Malnutrition in Sub-Saharan Africa: burden, causes and prospects. Pan Afr Med J. 2013;15:120.
6. M'Kaibi FK, Steyn NP, Ochola SA, Du Plessis L. The relationship between agricultural biodiversity, dietary diversity, household food security, and stunting of children in rural Kenya. Food Sci Nutr. 2017 Mar;5(2):243 54.
7. Caswell JA, Yaktine AL, Allotments C on E of the A of FR and S, Board F and N, Statistics C on N, Medicine I of, et al. Supplemental Nutrition Assistance Program. Supplemental Nutrition Assistance Program: Examining the Evidence to Define Benefit Adequacy. National Academies Press (US); 2013.
8. Kavosi E, Hassanzadeh Rostami Z, Kavosi Z, Nasihatkon A, Moghadami M, Heidari M. Prevalence and determinants of under-nutrition among children under six: a cross-sectional survey in Fars province, Iran. Int J Heal policy Manag. 2014 Jul;3(2):71–6.
9. Biondi D, Kipp W, Jhangri GS, Alibhai A, Rubaale T, Saunders LD. Risk Factors and Trends in Childhood Stunting in a District in Western Uganda. J Trop Pediatr. 2011 Feb;57(1):24–33.

10. Ahsan KZ, Arifeen S El, Al-Mamun MA, Khan SH, Chakraborty N. Effects of individual, household and community characteristics on child nutritional status in the slums of urban Bangladesh. Arch Public Heal. 2017 Dec;75(1):9.
11. Habaasa G. An investigation on factors associated with malnutrition among underfive children in Nakaseke and Nakasongola districts, Uganda. BMC Pediatr. 2015 Dec; 15(1):134.
12. UNESCO. SUSTAINABLE DEVELOPMENT BEGINS WITH EDUCATION. 2015. The Millennium Development Goals Report 2015. New York, United Nations
13. Chinnakali P, Upadhyay RP, Shokeen D, Singh K, Kaur M, Singh AK, et al. Prevalence of household-level food insecurity and its determinants in an urban resettlement colony in North India. J Health Popul Nutr. 2014 Jun;32(2):227–36
14. Sufiyan M, Umar A, Bashir S. Effect of maternal literacy on nutritional status of children under 5 years of age in the Babban-Dodo community Zaria city, Northwest Nigeria. Ann Niger Med. 2012;6(2):61.
15. Agedew E, Chane T. Prevalence of Stunting among Children Aged 6–23 Months in Kemba Woreda, Southern Ethiopia: A Community Based Cross-Sectional Study. Adv Public Heal. 2015 May;2015:1–6.
16. Fikadu T, Assegid S, Dube L. Factors associated with stunting among children of age 24 to 59 months in Meskan district, Gurage Zone, South Ethiopia: a case-control study. BMC Public Health. 2014 Dec;14(1):800.
17. Adeladza A. African journal of food, agriculture, nutrition, and development. Vol. 9, African Journal of Food, Agriculture, Nutrition and Development. AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST (ASSCAT); 2009.
18. Jawaregowda S, Angadi M. Gender differences in nutritional status among under five children in rural areas of Bijapur district, Karnataka, India. Int J Community Med Public Heal [Internet]. 2015;2(4):506–9. Available from: http://ijcmph.com/index.php/ijcmph/article/view/1007
19. Kandala N-B, Madungu TP, Emina JB, Nzita KP, Cappuccio FP. Malnutrition among children under the age of five in the Democratic Republic of Congo (DRC): does geographic location matter? BMC Public Health. 2011 Dec;11(1):261.
20. Kenya National Bureau of Statistics. Republic of Kenya Kenya Demographic and Health Survey 2014.
21. Feinstein S, Feinstein R, Sabrow S. Gender inequality in the division of household labour in Tanzania. African Sociol Rev Africaine Sociol. 2010;14(2):98–109.
22. Rhoads SE, Rhoads CH. Gender roles and infant/toddler care: Male and female professors on the tenure track. J Soc Evol Cult Psychol. 2012 Jan;6(1):13–31.
23. County Government of Kilifi. Kilifi County Integrated Development Plan, 2013- 2017. Kilifi; 2015
24. Buchmann C. Family structure, parental perceptions, and child labor in Kenya: What factors determine who is enrolled in school? Soc forces. 2000;78(4):1349–78.
25. Langbein J. Firewood, smoke and respiratory diseases in developing countries—The neglected role of outdoor cooking. Mortimer K, editor. PLoS One. 2017 Jun;12(6):e0178631.
26. Das I, Pedit J, Handa S, Jagger P. Household air pollution (HAP), microenvironment and child health: Strategies for mitigating HAP exposure in urban Rwanda. Environ Res Lett. 2018 Apr;13(4):045011.
27. Rutherford ME, Dockerty JD, Jasseh M, Howie SR, Herbison P, Jeffries DJ, et al. Access to health care and mortality of children under 5 years of age in the Gambia: a case-control study. Bull World Health Organ. 2009;87:216–24.
28. WHO. WHO | Global Database on Child Growth and Malnutrition. WHO. 2010;
29. Schoeps A, Gabrysch S, Niamba L, Sié A, Becher H. The Effect of Distance to Health-Care Facilities on Childhood Mortality in Rural Burkina Faso. Am J Epidemiol. 2011 Mar;173(5):492–8.
30. Bondi GA. Close encounters of a different kind: a study of science fiction fan and culture. 2011.
31. Galgamuwa LS, Iddawela D, Dharmaratne SD, Galgamuwa GLS. Nutritional status and correlated socio-economic factors among preschool and school children in plantation communities, Sri Lanka. BMC Public Health. 2017;17(1):377.
32. CDC. (2012). Guidelines for Evaluation of the Nutritional Status and Growth in Refugee Children during the Domestic Medical Screening Examination Division of Global Migration and Quarantine.