INFLUENCE OF FOOD TABOOS OF THE MIJIKENDA ON THE NUTRITIONAL STATUS OF UNDER-FIVE-YEAR-OLD CHILDREN

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ABSTRACT
Child-under nutrition leads to high morbidity and mortality in many developing countries. Approximately 3.1 million child deaths annually are attributed to malnutrition related illnesses. Causes malnutrition include household income, political and economic instability, education level, sanitation, climatic conditions, culinary practices, and food beliefs. The influence of food taboos among the Mijikenda on child nutrition is not fully investigated. This study investigated whether Mijikenda food habits and taboos had an influence on the nutrition status of under-five year old children. Focus group discussions with Kaya elders from five Mijikenda subgroups were used to identify food taboos. Structured questionnaire was developed to find out whether these taboos affected food choices by mothers. Anthropometric measurements of children, weight-for-age z-score (WAZ), height-for age z-score (HAZ), skin fold thickness and visual examination were used to determine nutritional status of chidren. Commonly restricted foods were animal products including eggs, fish, gizzards, beef, chicken, liver, pepper and some vegetables. The restrictions targeted women, especially pregnant women, and children but not men. There were significant correlations between WAZ and number of children in the family ($r = 0.228$, $P = 0.009$); mother's education level and number of children ($r = -0.346$, $P = 0.000$). There was positive correlation between WAZ and consumption of meat after delivery ($r = 0.194$, $P = 0.029$); WAZ and consumption of gizzard ($r = 0.285$, $P = 0.001$); HAZ and consumption of liver ($r = 0.208$, $P = 0.019$); skin fold thickness and breastfeeding while pregnant ($r = 0.199$, $P = 0.027$), Skin fold thickness and consumption of gizzard ($r = 0.198$, $P = 0.025$) and negative correlation between HAZ and pumpkin while pregnant ($r = -0.173$, $P = 0.049$). Mother's adherence to the food taboos showed negative nutritional outcomes. This study shows that children from mothers who ignored traditional food restrictions had better nutritional outcomes than for those who adhered to the restrictions. Food taboos should be considered as a significant contributor to malnutrition and needs to be addressed in nutritional intervention programmes.
Keywords: Mijikenda, food taboos, children, nutrition status, HAZ, WAZ

INTRODUCTION

Proper nutrition is crucial to health status of individuals throughout life cycle (Oniang'o, Mutuku and Malaba, 2003). Malnutrition refers to conditions when the body does not get the right amount of the nutrients to maintain healthy tissues and organ function. It refers to both undernourishment and over nourished. In rich developed countries, overnutrition is more common leading to obesity and other obesity induced health complications but in Africa and many developing countries, undernutrition is the most common, especially protein-energy malnutrition (PEM). In sub-Saharan Africa, infant and young child between 6 and 23 months with moderate acute malnutrition (MAM) are more vulnerable to inadequate food intake resulting in high morbidity and mortality rates (UNICEF, 2019). PEM continues to be a major health burden and is a major risk factor for morbidity and mortality among young children. About 60% of all deaths, occurring among children aged less than five years in developing countries, could be attributed to malnutrition (Ubesie *et al*., 2012, Müller and Krawinkel, 2005). Approximately 32% of children less than 5 years of age in developing countries are stunted and 10% are wasted. It is estimated that sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first 6 months of life, results in 1.4 million deaths and 10% of the disease burden in children younger than 5 years (Onis *et al*., 2012, Black *et al*., 2013). Optimal infant and young child feeding practices are some of the most effective interventions for improving child health.

Protein-energy malnutrition and micronutrient deficiencies can be caused by many factors including household income, socio-political situations, education level, sanitary, climatical, food production and disease conditions, quality of health services, cultural and religious customs that may restrict food choices (Müller and Krawinkel, 2005). Customary laws of some African communities have restrictions that affect family food distribution. Food distribution is often related to hierarchal position, with the husband as the head of the family receiving priority while the wife and children receiving a smaller share of the food (Oniango *et al.*, 2003). Food beliefs define what a meal is; thus may influence attitudes towards certain foods, food

preparation, breastfeeding, infant feeding practices and food sharing and distribution within the family (Oniang'o *et al*., 2003). In some cases, the male children are fed first before the mother and female children and this can lead to under nutrition for the most vulnerable groups.

The Mijikenda comprise nine Bantu ethnic sub-groups inhabiting the coast of Kenya, between the Sabaki river in Kilifi County to the north and the Umba river to the south on the Kenya Tanzania border in Kwale County. Chonyi, Duruma, Giriama, Jibana, Kambe, Kauma, Rabai, and Ribe are found mainly north of Mombasa in Kilifi, while the Digo are found to the south of Mombasa in Kwale county (Sperling, 1988). Each ethnic group has unique customs and dialect of the Mijikenda language but they can communicate with each other and their customs are fairly similar.

The Mijikenda community is rich in many taboos some of which are likely to affect food choices. According to Mijikenda culture, when a mother with an infant or toddler becomes pregnant, 'the heat' from the unborn child burns the toddler when the child sleeps with the mother, leading to severe emaciation (Abu-bakar *et al.,* 2012). In addition, they believe marital infidelity by either parent can lead to severe disease referred to as *chira* in children conceived subsequent to the transgression (Abu-bakar *et al.,* 2013). *Chira* could be misdiagnosed marasmus. Such and other beliefs can lead to misdiagnosis of infant malnutrition cases such as kwashiorkor or marasmus, leading to incorrect intervention. There are also cultural beliefs regarding pregnancy, sexuality and aetiology of severe malnutrition. These laws were instilled from early age and failure to adhere to the same would attract severe punishment from the elders. The existence and extent of adherence to taboos among the Mijikenda communities has not been fully investigated to the best knowledge of the authors. The aim of this research was therefore to investigate the food taboos that have a bearing towards food choice and intake among the Mijikenda.

MATERIALS AND METHODS

Study Population and research design

The study targeted women of child bearing age and children below 5 years of the Mijikenda community living in Kilifi and Kwale counties. The research design was a cross sectional cohort survey carried out among the Mijikenda communities living along the Kenya Coast in Kilifi and Kwale counties. Five subgroups of the Mijikenda community were randomly selected, for the study. The selected subgroups were Giriama, Rabai, Chonyi, Duruma and Digo. One Kaya from each of the selected subgroups was purposely selected for inclusion, based on the selection criteria that included being far from urban centres thus minimum external influence, accessibility of the Kaya and presence of human settlements around the Kaya

Sampling and Data Collection Procedures

Data collection was done in two phases. In the first phase, 10 Kaya elders from each of the selected Kayas were selected to form focus group discussion (FGD) on food taboos, food habits and customs. The objectives of the focus group discussions were to identify the food taboos among the Mijikenda and establish which of these laws could affect nutritional status of under-five year old children. Structured questions were used to guide focus group discussions.

During the second phase of the study, results from the FGD were analysed and used to develop questionnaires for data collection. Thirty women from each of the selected sub-groups were purposely selected. Criteria for inclusion included: having children under the age of five years, living among the selected Mijikenda community and being Mijikenda by birth. Structured interviews and questionnaires were used to collect data. Nutritional assessment of children under the age of five years belonging to the selected mothers was conducted to establish the nutritional status of their children using non-invasive procedures. Anthropometric measurements included age of the child, height, weight, mid-upper arm circumference and skin fold thickness at the lower side the arm. Clinical signs used to check for physical signs of nutrient deficiencies in children included skin colour, hair texture and colour, eyes appearance, tongue, finger nails, gums, bone structure, teeth, lips and signs of wasting. Trained assistants were involved in data collection. Height for age Z scores and WAZ scores were determined using the WHO standard tables for boys and girls. Dietary diversity was determined by the number of food subgroups consumed by the family using the 24 hour recall results.

Ethical Considerations

Informed consent was obtained from the Kaya elders and mothers with children under the age of five years who participated in the study. The research protocol was explained to the participants in a language that is familiar with them and each of them signed consent forms agreeing to participate in the study. Mothers signed consent forms on behalf of their children before their children were involved in the study. Participation was voluntary and a participant was free to withdraw without giving reasons at any time. Permission to conduct the research was sought and granted by the Ethics Review Committee of Pwani University.

Data Analysis
Data was analysed using the SPSS version 10. Correlation analysis was used to test the strength of association between adherence to traditional food restrictions and nutritional status

RESULTS AND DISCUSSION
Phase One Results
The selected Kaya elders from each subgroup were engaged in focus group discussion. Kiswahili and the local dialects were used during the FGDs that were held within the Kayas. Kaya customs such as dress code were adhered during the discussions. Entry into the inner Kayas was not permitted since is allowed only for selected elders, mainly for *matambiko* (sacrifices and prayers). All the group discussions were conducted in the general Kaya grounds.

Common Foods and Eating Habits of the Mijikenda
The Mijikenda main foods were vegetables and stiff porridge (*ugali*). The vegetables come from an array of wild green leaves. Other cereals were cassava, millet and sorghum. The common foods consumed by the Mijikenda communities are listed in Table 1.

Table 1: Common foods consumed by the Mijikenda

Cereals and root crops	***Legumes***	***Meats***	***Vegetables***
Cassava Maize, (prepared mainly as stiff porridge) Millet (*wimbi*) Sorghum Sweet potatoes	Cow peas Green grams Beans.	Fish Pala Dikdik	Kales Kigwada (cassava leaves) Kiswenya (*Amaranthus hybridus and A. dubius)*, Mabenda (Okra), Mchicha (*Amaranthus*), Mnavu (African nightshade), Mutsunga *(Launaea cornuta)*, Mwangani (Spider plant) Tsafe (Cow pea leaves).

Vegetables are relatively rich in vitamins (Lee *et al.*, 2018), hence Mijikenda diets are rich in vitamins, except in the dry seasons when vegetables are rare. There was a limited variety of protein sources and included wild some legumes, meat and fish. The Mijikenda diet is predominantly composed of ugali, green leafy vegetables and occasionally some protein sources mainly legumes. Animal protein sources were rare except for those living near the sea where fish was available. Some game meat was also consumed and we also observed that boys hunted for grass hoppers, which could provide a limited amount of animal protein and other nutrients (van Huis, 2018).

Traditional Infant Feeding Practices
From the results of focus group discussions, it was found that there were some groups that restricted baby feeding foods. Colostrum was restricted in all the subgroups except the Digo (Table 2). However, it was also noted that the Ministry of Health actively encouraged mothers to breastfeed immediately after delivery (Brown *et al.*, 2008) and the restrictions were largely ignored especially by mothers who attended perinatal and antenatal clinics.

Table 2: New born feeding practices

Sub-group	***Traditional infant feeding practices***
Digo	Breastfeeding starts immediately after birth
Duruma	No Breast feeding first day, Colostrum (*Kilamo*) is expressed and discarded for the first day. Breast feeding goes on till baby begins to walk in the first year
Chonyi	No breast feeding on first day, only warm water. Colostrum (*Kilamo*) is expressed and discarded for the first day. Soft ugali introduced after two weeks
Rabai	No Breast feeding first day, baby is fed on madafu (juice from immature coconut fruit). Breast feeding continues after the first day.
Giriama	No breast milk for first three days. Colostrum (Kilamo) is expressed and discarded for the first three days. Babies given boiled herbs and madafu for 4 days. Breast feeding is main source of feeding

Restricting colostrum for new-borns denies them the immunological protection that is supplied by the immunoglobulins in colostrum and other nutritional benefits therein (American Pregnancy Association). The prohibited foods, for infants such as breast milk and especially colostrum, deny the infant foods of high nutritional value, especially in enhancing immune response and could have long term adverse health effects. The Mijikenda provide pre-lacteal feeds before initiating breastfeeding such as sugared water, coconut juice, traditional herbs *(mihaso*) and vegetable juice to expel meconium and clean the infants stomach before it starts to breastfeed. The participants reported that these concoctions may be given for up to three days before the commencement of breastfeeding. The Digo did not have such practice but breastfeeding started immediately after birth. Colostrum was also discouraged among the Mijikenda because it is believed to be fermented and could cause diarrhoea.

This practice is contrary to the WHO (2017) recommendations that emphasize provision of mother's breast milk to infants within one hour of birth. This ensures that the infant receives the colostrum, rich in immunoglobulins and other essential nutrients necessary for growth and immunological protection of the baby. Indicators used to determine weaning time included the ability of the child to walk or talk and the commencement of another pregnancy. Mothers believed breast milk was inadequate and hence the need to introduce weaning as early as two months to prevent the baby from constantly crying out of hunger and help the mother to attend to other household chores as the baby sleeps for longer hours and cries less often when fed on alternative foods. It was observed that most mothers appeared under-fed and as such might not produce enough milk for the baby. There was a belief that weaning relieves stomach discomfort in new born, suspected to be infantile colic. Infantile colic is a syndrome characterized by excessive, unexplained paroxysmal crying in an otherwise healthy baby (Oshikoya *et al.*, 2009).

Table 3: Common restricted foods for pregnant women and children amongst the Mijikenda

Prohibited Foods	***Reason supporting the prohibition***
Lamb meat (Ng'onzi)	Causes *kufurisha* (oedema) in pregnant women
Roast meat	Causes stomach ache
Mkunga (Eel) (for pregnant women)	Child will get *nyongoo* (anaemia, jaundice oedema)
Tafi (type of fish)	Child will be born bald
Eggs	Give birth to baby with a bald head or to big baby
Dried fish- shark (Papa)	Triggers a spontaneous abortion
Rabbit meat	Baby will be born with big ears
Eggs for (pregnant women)	Child will be born bald
Mabenda (Okra)	Child will be born bald
Offal from the goat (Matumbo ya mbuzi/goat)	Can result in birth complications, over bleeding, prolonged labour
Seafood	Birth complications/prolonged labour/lack sleep/constipation
Sour milk	Causes abortion and has a lot of fat
Cold maize meal (Uholwe)	Causes flatulence (*Kuvimbirwa*)
Pumpkin (Marabu) and pounded maize	Causes rectal prolapse (*Tsango/Shango*)
Gizzard	Reserved for men as symbol of respect for head of the household

Most foods that are restricted are protein-rich, and the restrictions were for women and children. The consumption of protein food is inadequate based on the sources but is aggravated by the food taboos. This is likely to reduce protein intake further. It was also reported that children less than two years, regardless of their gender, ate together with their mothers among the Mijikenda communities. This implies that food prohibitions affecting mothers would by extension affect the children and as such food prohibitions on mothers could deny the children essential nutrients that are necessary for normal growth.

Order of Serving Food in Family

Meals were served following the same patriarchal order for all the sub-groups. Men were served first, followed by boys and finally the women and girls last. These findings are in agreement with those of Oniang'o *et al*. (2003). The man is served first to honour him as the head of the family. This was the same in all the focus groups. Where food is not adequate, this pattern can disadvantage the mothers and girls.

Perceived Causes of Common Childhood Diseases

During the FGDs, it was revealed that some diseases, including malnutrition related conditions were thought

to be due to various transgressions of the traditional taboos and other factors. Some of these are listed in Table 4. The childhood diseases were generally associated with the consumption of restricted foods, breaking of the traditional beliefs and the weather. For example, the disease condition referred to as Chirwa, and associated with marital infidelity, was most likely marasmus caused by malnutrition. Treatment was often by traditional medicine men/women. These diagnoses can lead to nutritional deficiencies being misdiagnosed and unattended to. Misdiagnosis of nutritional deficiencies can lead to the escalation of the problem because it remains unresolved. According to Muraya *et al*. (2016) understanding the dynamics of perceptions of illness, gender intra-household relations, and how these interact with recognition of child under-nutrition, subsequent treatment, and interactions with nutrition interventions is crucial to addressing malnutrition.

Table 4: Common childhood diseases

Kaya/Clan	***Disease condition***	***Perceived causes***
Digo	Chirwa (wasting)	Marital unfaithfulness
	Ukambi nyuuni/chigwaduro (measles)	Eating soil
	Uvimbe	No definite cause given
	Mwakidzuni	Breast milk
Duruma	Nyuuni/convulsions, Coughing, Nyama adzulu, Mwadzulu/Still birth	No definite causes given
	Kwashiorkor	Stopping breast milk
	Chirwa (wasting)	Marital unfaithfulness
Chonyi	Nyuuni/pepo punda (Tetanus) Chigwadulo Mwandimu/body swelling	Mosquito bite No definite cause given No definite cause given
Rabai	Chirwa / kwashiorkor	Marital unfaithfulness
	Tsagwar/asthma Nyuuni	No definite cause given
	Muinyo (dry mouth and nose) Chinyere nyere	Caused by cold weather
Giriama	Chirwa (wasting)	Marital unfaithfulness
	Luhosi	
	Kishonono (Ghonnorhea)	
	Nyongoo (bleeding before birth)	
	Kadonera	

Socioeconomic Characteristics of Mothers

Of the 129 respondents who indicated their ethnic backgrounds, three were from the Jibana sub-group and six from Kauma. Their inclusion into the selected groups could be due to intermarriage or migration.

Education Level of Mothers

Figure 1 show that about 34 mothers (25%) had no formal education while 79 (58%) had primary level education. Fourteen mothers had reached form four, while 8 mothers had gone beyond form four level and none had university degree. These results indicate a low level of education among Mijikenda women. In this study, we found that most of the mothers had very limited formal education. According to the Kenya National Bureau of Statistics only 13% of Kilifi residents have a secondary level of education or above (KNBS, 2017). Some 36% of Kilifi County residents have no formal education. The enrolment rate in secondary school in the county is 42.5% with boys having a higher enrolment rate than girls.

Occupation of Mothers

Table 5 shows that 31% of the respondents were housewives with no specific source of income, 25% did farming and 27% were involved in business. Their income levels were generally low (Table 6).

Family Income

many respondents did not indicate their family income level. Over 80% of those who responded earned below Kenya shillings (KES) 15,000.00 per month and only 2% earned more than KES 24,000.00 per month (Table 6). This indicates that most families are not financially well up. The high percentage of those who did not respond on the income question (43.7%) could be an indication of no formal employment but this needs further investigation.

Marital status of the mothers

Table 7 shows that over 91% of the mothers were married and only 3% were divorced. The others were either single (3.7%) or widowed (1.5%). This indicates that divorce is not common among the Mijikenda. The percentage of single mothers (3.7%) was also quite low among the Mijikenda community.

Age of mothers

All the mothers were below 45 years and over 60% were below 30 years. Six out of the 135 mothers were below 20 years (Table 8). Most of the mothers (82%) were between 20 and 34 years old (Table 8).

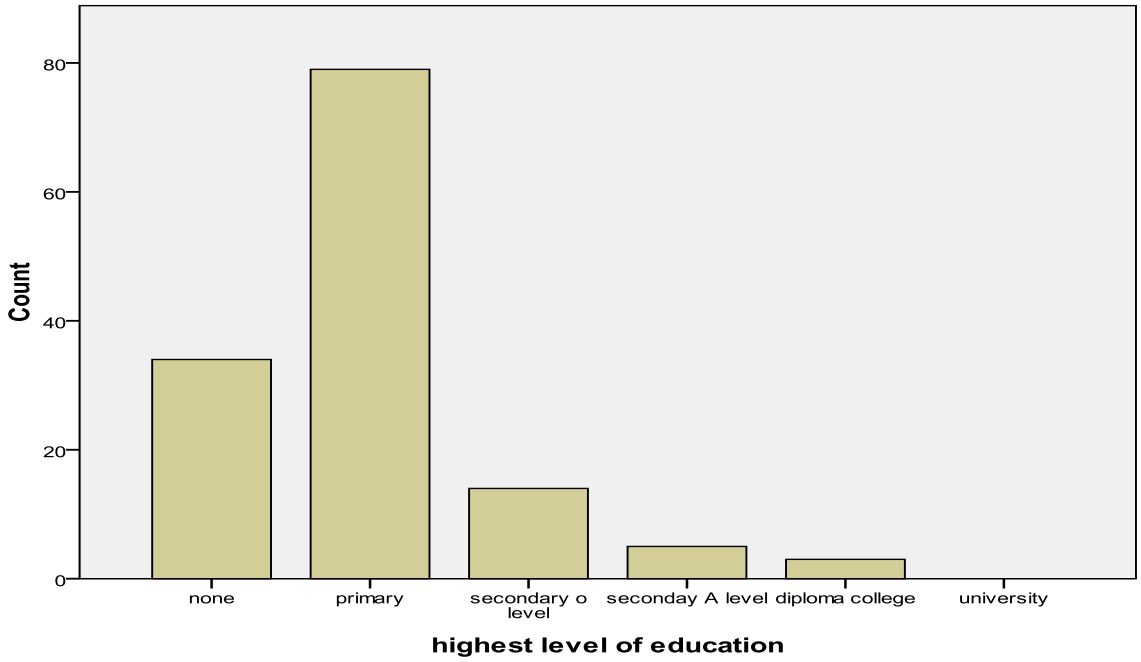

Figure 1: Highest education levels of mothers

Table 5: Occupation of respondents

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Business	26	19.3	20.6	20.6
	Farming	32	23.7	25.4	46.0
	House wife	39	28.9	31.0	77.0
	Masonry	4	3.0	3.2	80.2
	Salonist	7	5.2	5.6	85.7
	Teaching	4	3.0	3.2	88.9
	Driver	4	3.0	3.2	92.1
	Tailoring	2	1.5	1.6	93.7
	EPZ	2	1.5	1.6	95.2
	Community health volunteer	1	.7	.8	96.0
	Hospital casual worker	1	.7	.8	96.8
	Cook	3	2.2	2.4	99.2
	Tour guide	1	.7	.8	100.0
	Total	126	93.3	100.0	
Missing	System	9	6.7		
Total		135	100.0		

Table 6: Average monthly family income

Income (KES) per month		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 4000	26	19.3	34.2	34.2
	4000-14000	35	25.9	46.1	80.3
	15000-24000	12	8.9	15.8	96.1
	25000-34000	3	2.2	3.9	100.0
	Total	76	56.3	100.0	
Missing	System	59	43.7		
Total		135	100.0		

Table 7: Marital status of the respondents

Marital status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	5	3.7	3.7	3.7
	Married	123	91.1	91.8	95.5
	Widow	2	1.5	1.5	97.0
	Divorced	4	3.0	3.0	100.0
	Total	134	99.3	100.0	
Missing	System	1	.7		
Total		135	100.0		

Table 8: Age of responding mothers

Age of mother		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 20	6	4.4	4.4	4.4
	20-24	36	26.7	26.7	31.1
	25-29	43	31.9	31.9	63.0
	30-34	32	23.7	23.7	86.7
	35-39	17	12.6	12.6	99.3
	40-44	1	.7	.7	100.0
	Total	135	100.0	100.0	

Number of Children in the Family

Twenty eight (20.9%) of the families had one child, 25 (18.7%) had two children and 21 (15.7%) had three children in their families. Fourteen families had seven and more children (Table 9). It can thus be seen that the Mijikenda generally have large families. The number of people living in the households are many (Table 9) and this could have an impact on food availability.

Relationship Between Nutrition Status and Demographic Characteristics and Anthropometric Measurements and Adherence to Food Taboos

There were no visible signs of severe malnutrition in all the chidren assessed hence clinical signs was discarded. There was significant ($P < 0.05$) positive correlation between the number of children per family and WAZ, level of education and dietary diversity, the age of the mother and the number of children in the family, while there was significant ($P < 0.05$) negative correlation between level of education of mother and number of children (Table 10).

It appears that education level of the mother could improve the nutritional outcomes in a family through dietary diversity and reduced family size. The fewer number of children seen for more educated mothers could be either due to access to family planning services or delay in marriage as one pursued education (Table 11).

Table 9: Number of children in the family

Number of children		*Frequency*	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	1	28	20.7	20.9	20.9
	2	25	18.5	18.7	39.6
	3	21	15.6	15.7	55.2
	4	6	4.4	4.5	59.7
	5	24	17.8	17.9	77.6
	6	16	11.9	11.9	89.6
	7	5	3.7	3.7	93.3
	8	3	2.2	2.2	95.5
	9	5	3.7	3.7	99.3
	10	1	.7	.7	100.0
	Total	134	99.3	100.0	
Missing	System	1	.7		
Total		135	100.0		

Table 10: Correlation between Nutrition Status and Demographic Characteristics of Mother

		WAZ	HAZ	highest level of education	Mijikenda sub group	Age (mother)	number of children	average monthly income	children below 5 years	dietary diversity
WAZ	Pearson Corr.		.251**	-.093	.050	.157	.228**	.223	.000	-.074
	Sig. (2-tailed)		.004	.289	.573	.071	.009	.055	.996	.400
HAZ	Pearson Corr.			.012	.117	-.059	-.136	.017	-.041	-.002
	Sig. (2-tailed)			.889	.192	.503	.121	.882	.638	.978
level of education	Pearson Corr.				.174*	-.118	-.346**	.095	-.089	.214*
	Sig. (2-tailed)				.048	.172	.000	.413	.304	.013
Mijikenda sub group	Pearson Corr.					.025	-.165	-.098	-.110	-.033
	Sig. (2-tailed)					.777	.063	.411	.217	.708
Age (mother)	Pearson Corr.						.549**	.041	.134	-.001
	Sig. (2-tailed)						.000	.723	.122	.987
number of children	Pearson Corr.							.007	.340**	-.090
	Sig. (2-tailed)							.951	.000	.301
average monthly income	Pearson Corr.								-.041	-.082
	Sig. (2-tailed)								.727	.479
number of children below 5 years	Pearson Corr.									-.065
	Sig. (2-tailed)									.455
dietary diversity	Pearson Corr.									
	Sig. (2-tailed)									

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 31: Correlation between nutrition status and compliance to some food prohibitions

		WAZ	HAZ	skinfold thickness	Egg consumption during pregnancy	Consumption of meat after delivery	Breast feeding when pregnant	Consumption of gizzard	Pumpkin consumption while pregnant	Consumption of liver	After how long was the baby breast fed(day/hour)
WAZ	Pearson Corr.		.251**	.245**	-.105	.194*	-.007	.285**	.080	.062	.118
	Sig. (2-tailed)		.004	.005	.236	.029	.941	.001	.366	.489	.566
HAZ	Pearson Corr.			.073	-.113	-.013	-.010	.099	-.173*	.208*	.077
	Sig. (2-tailed)			.407	.201	.882	.908	.262	.049	.019	.713
skinfold thickness	Pearson Corr.				-.042	.149	.199*	.198*	.156	.077	.028
	Sig. (2-tailed)				.638	.098	.027	.025	.079	.389	.893
consumption of eggs during pregnancy	Pearson Corr.					.205*	-.032	.103	.188*	.152	-.133
	Sig. (2-tailed)					.021	.726	.240	.032	.086	.508
consumption of meat after delivery	Pearson Corr.						-.051	.071	.181*	.234**	.162
	Sig. (2-tailed)						.579	.426	.041	.009	.438
breast feeding when pregnant	Pearson Corr.							.265**	.183*	.209*	.089
	Sig. (2-tailed)							.003	.042	.021	.664
consumption of gizzard	Pearson Corr.								.192*	.457**	.318
	Sig. (2-tailed)								.028	.000	.106
consumption of pumpkin while pregnant	Pearson Corr.									.202*	.225
	Sig. (2-tailed)									.022	.258
consumption of liver	Pearson Corr.										.308
	Sig. (2-tailed)										.125
after how long was the baby breast fed(day/h)	Pearson Corr.										
	Sig. (2-tailed)										

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

These findings are in agreed with others (Abuya *et al*., 2012, Makoka, 2013, Aisha *et al*., 2017). This however needs to be investigated further. Family income did not have any significant effect on nutritional status of the children. Improved nutrition outcomes as seen from the positive correlation between WAZ and number of children; age of the mother and number of children could be due to experience in baby feeding with practice. Those mothers with more children were generally older than those with few children. They could thus have benefited from more maternal child heath clinics and experience in infant feeding than younger mothers.

Relationships Between Children Demographic Characteristics and Anthropometric Measurements

Table 10 shows significant positive correlations ($P < 0.05$) between, WAZ and HAZ, WAZ and skin fold thickness; HAZ and age of child; (Table 10). There was negative correlation between education level of mother and the number of children. This could be due to more exposure to family planning services for the more educated mothers or delay in marriage as they pursued education but this needs further investigation.

Adherence to Food Taboos

Failure to consume restricted foods, as per the 24 hour recall, was taken as an indication of adherence to the taboo. The nutritional status of the children as measured using the WAZ was significantly ($P < 0.05$) positively correlated to consumption of meat after delivery and gizzard by mother (Table 11). It appears that those who consumed meat while pregnant also ate liver, and pumpkin while pregnant. This indicates that they did not adhere to the food taboos. This resulted in positive nutritional outcomes as determined by their significant ($P < 0.05$) positive correlations with skin fold thickness, WAZ and HAZ scores.

CONCLUSION AND RECOMMEDATIONS

Results from this study indicate that there are many food taboos among the Mijikenda communities that could adversely affect family food consumption patterns. The taboos mainly target women and children adversely by putting restrictions on what they can and cannot consume. There were no food taboos restricting men on what they can eat. It was also noted that most restrictions were against high protein foods like meats, at the time when these nutrients were most desirable and needed by expectant and lactating mothers hence likely to have severe adverse maternal and infant nutritional outcomes.

However, it was found that adherence to these taboos was low probably due to the efforts of nutrition extension workers especially during prenatal and antenatal clinics. Attendance of antenatal clinics has been associated with positive nutritional outcomes in infants (Chakona and Shackleton, 2019). Those who ignored the taboos tended to have better growth for their babies than those who observed the restrictions imposed by the food taboos.

From the results of this study, we recommend that nutritional extension services to mothers and pregnant women be intensified. This should cover not only maternal and infant feeding but feeding for the whole family. The extension services need to recognize food taboos as malnutrition risk factors and should target and try to eradicate those that are retrogressive to the nutritional and health wellbeing of the Mijikenda communities.

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REFERENCES

Abubakar, A., Van Baar, A., Fischer, R., Bomu, G., Gona, J.K. and Newton, C.R. 2013. Socio-cultural determinants of health-seeking behaviour on the kenyan coast: a qualitative study. PLoS ONE 8(11): e71998. doi:10.1371/journal.pone.0071998

Abuya, B.A., Ciera, J. and Kimani-Murage, E. 2012. Effect of mother's education on child's nutritional status in the slums of Nairobi. BMC Pediatr 12:80. https://doi.org/10.1186/1471-2431-12-80

Aisha Iftikhar, Attia Bari, Iqbal Bano, Qaisar Masood 2017. Impact of maternal education, employment and family size on nutritional status of children. Pak J Med Sci. 2017 Nov-Dec; 33(6):1401–1405.

American Pregnancy Association. Colostrum, The super food for your baby. https://americanpregnancy.org/healthy-pregnancy/breastfeeding/colostrum-is-superfood-for-your-newborn/ Accessed on 1/09/2021.

Arnold van Huis. 2018. Insects as Human Food in Ethnozoology. In: Rômulo Romeu Nóbrega Alves and Ulysses Paulino Albuquerque (eds). Animals in Our Lives. Academic press. Pages 195–213.

Black R.E., Victora C.G., Walker S.P., Bhutta Z.A., Christian P., De Onis M. 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 382:427–451.

Celia A Brown, Salim B Sohani, Khalid Khan, Richard Lilford and Walter Mukhwana. 2008.

Antenatal care and perinatal outcomes in Kwale district, Kenya. *BMC Pregnancy and Childbirth* volume 8, Article number: 2. open access Journal.

Gamuchirai Chakona and Charlie Shackleton. 2019. Food Taboos and Cultural Beliefs Influence Food Choice and Dietary Preferences among Pregnant Women in the Eastern Cape, South Africa. Nutrients 11(11):2668. Published online 2019 Nov 5. https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-8-2

KNBS. 2017. *Economic Survey.* https://www.knbs.or.ke/download/economic-survey-2017/>

Makoka, D. 2013. The Impact of Maternal Education on Child Nutrition: Evidence from Malawi, Tanzania, and Zimbabwe. DHS Working Papers No. 84. Calverton, Maryland, USA: ICF International.

Mercedes de Onis, David Brown, Monika Blössner and Elaine Borghi. 2012. Levels and Trends in Child Malnutrition. UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates. https://www.who.int/nutgrowthdb/cover.pdf Accessed on 30/8/2021

Müller, O. and Krawinkel, M. 2005. Malnutrition and health in developing countries. Canadian Medical Association Journal, 173(3):279–286.

Muraya, K.W., Jones, C., Berkley, J.A. and Moleyneux, S. 2016. Perceptions of childhood malnutrition among rural households on the Kenyan coast – a qualitative study. BMC Public health, 16(1):693.

Oniango, R.K., J.M. Mutuku., and S.J Malaba. 2003. Contemporary African Food habits and their Nutritional and Health implications. Asia Pacific. J clin Nutr., 12(3):231-236.

Oshikoya, K.A. and Senbanjo, I.O. 2009. Pathophysiological changes that affect drug disposition in protein-energy malnourished children. Nutrition and Metabolism, 6(1):50.

Seongeung Lee, Youngmin Choi, Heon Sang Jeong, Junsoo Lee and Jeehye Sung. 2018. Effect of different cooking methods on the content of vitamins and true retention in selected vegetables. Food Science and Biotechnology, 27:333–342.

Sperling, David Colton. 1988. The growth of Islam among the Mijikenda of the Kenya coast, 1826 - 1933. Strathmore University, p. 29

Ubesie, Agozie C., Ngozi S Ibeziako, Chika I Ndiokwelu, Chinyeaka M Uzoka and Chinelo A Nwafor. 2012. Under-five Protein Energy Malnutrition Admitted at the University of Nigeria Teaching Hospital, Enugu: a 10 year retrospective review. Nutrition Journal, 11:43. http://www.nutritionj.com/content/11/1/43 accessed 22/07/2015.

UNICEF. 2019. Children food and nutrition, Growing well in a changing world. UNICEF.

World Health Organization. 2017. Guideline: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. WHO Document Production Service, Geneva, Switzerland.