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Original Article

Parenting Approaches on Children Food Uptake and Nutrition Status in Kiambu County, Kenya

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ABSTRACT

Parental use of reward and punishment is a key to reinforcement or deterrence of food choices among children an aspect that affects nutritional status throughout an individual's life span. Kenya has a population of 47,564,296 people according to demographic survey of Kenya 2019, of whom 1.4 % are school-going children aged 6-years in Juja Sub-County of Kiambu, (Kenya National Beural of Statistics,2019). Cross-sectional analytical research design was adopted on 384 parent-child pairs, who were disproportionately sampled. Researcher-administered questionnaires were used to collect data. SPSS software version 26.0 was used to analyse the data with significance $p<.05$. Anthropometry data was analysed using WHO Anthro-Plus Survey Analyzer and compared to BMI-for-age (BAZ), weight-for-age (WAZ) and height-for-age (HAZ) Scores for the target population. Pearson's correlation (r) was used to establish association. Boys were 48.0% while girls were 52.0% with a mean age of 6.4± 0.1. Almost half the index children (45.1%) were born first. Mean household size was 5.0± 1.66 with maternal mean age at 34± 4.9 years and that of the fathers at 39± 4.8 years. The majority of mothers (73.0%) and fathers (76.1%) had tertiary level of education with more fathers than the mothers in the formal sector of employment, with a higher income. All (100%) children reported being rewarded by receiving incentives like praise words (60.1%), while majority of them (92.0%) reported being punished in multiple ways by the mothers when they refused to feed yet a third of fathers (61.0%) praised and gifted their children to feed. Prevalence of stunting (6.9%), underweight (7.1%), wasting (7.2%), overweight (16.4%) and obesity (11.7%) was observed in the study population. A positive strong significant relationship ($p=0.05$, $x^2=5.2$) between age of the mothers and punishment was noted, also shouting threats, grounding, inflicting pain & withdrawal of privileges ($p=0.05$, $x^2=9.6$) was common among the married mothers. More parents with tertiary education (74.6%) and higher incomes (40.5%) gifted and gave special permissions which had a stronger positive relationship to food choices ($p=0.06$, $x^2=4.33$) and nutritional status ($p=0.04$, $x^2=5.9$). Food choices had a strong positive relationship to nutritional status ($p=0.05$) and so did dietary diversity ($p=0.6$). Majority of the parents reported that the

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demographic characteristics (83.8%) and Socio-economic characteristics (90.7%) affected their food choices as a household. Almost all mothers (98.8%) and more than half of the fathers (55.4%) felt that rewarding and punishing the study children in relation to food had an effect on their food choices and approaches.

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INTRODUCTION

Behavioral psychologists have established that the minds of children from infancy, work in different ways, with their main channel of learning being parental behaviour conditioning received or observed from their parents and older siblings. (Freiman,2018). From a dietary perspective, the major reason undercutting the beliefs and thoughts children have on proper diet was the linkage of certain foods to certain socio-cultural, religious or ethnic groups by their parent. The presence of media resources accessible to children such as television, smart phones and social media have only compounded the erroneous views on food held by most children.

Parental use of reward and punishment has been one of the major determinants of food choices and nutritional status among school-going children affecting their growth and compromising their general health as observed in the UNICEF conceptual framework of malnutrition (Gebrie et al., 2018). Despite the information sources and the growing awareness on the importance of a healthy food choices, there is minimal transfer of the intentions to action by the parents to the children especially within Kenya and it's counties (Government of Kenya, 2016; Kigaru et al., 2015). A parent's decision to reward or punish a child has a consequence on the child's food choices forming a hushed reality to the child who learns to associate the two. In the process of good choice formation, parental use of reward and punishment has been labelled the slowest but most important process that demands persistence (Freiman, 2018), as it's been argued to be a driving force behind many of the existing unhealthy food choices (African Population and Health Research Center (APHRC), 2014). This study was to establish the relationship between parental reward and punishment and food choices, dietary diversity and nutritional status.

The findings from the study will contribute to the growing body of knowledge on food behaviourism through publication and aid in achieving the 3rd Sustainable Development Goals on good health and well-being. The findings also provided program developers in the Ministry of Health, Ministry of Education and other stakeholders with the information required to develop efficient programs to improve on child feeding and nutrition.

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LITERATURE REVIEW

The theories associated with childhood learning are behaviourism and Cognitivism (LeFrancois et al., 2006) both of which are intertwined. Operant behaviour conditioning theory of an American behaviourist, Burrhus Frederic (BF) Skinner (1974) is founded on the notion that learning is a function of change in behaviour resulting from an entity's response to actions that arise in the environment, (Skinner et.al, 2009). Skinners work was more influenced by Edward Thorndike, who proposed the law of effect where he stated that "*activities that are followed by desired results are more likely to be repeated while those followed by unwanted results are less likely to be repeated"* (Thorndike, 1933). He stated that when a given response produces a consequence that is reinforced, the individual gets conditioned to emit a response and not elicit one due to an external stimulus (Mcleod, 2018; McLeod, 2015).

Globally, food choices were determined by sensory appeal, natural content of the food item, individuals' health, familiarity with the food, convenience, mood, weight control, religion and socio-economic concerns (Ting et al., 2017) all of which were affected by the parental use of reward and/or punishment aspect of learning earlier in life. Regionally and especially in Kenya, food choices developed within the households were influenced by reward and/or punishment, the community, local food cuisine, food availability in the local market and socio-economic factors. Children then model their food choices, satisfaction or even dissatisfaction around their environment resulting in positive or negative outcomes on their nutritional status (Scaglioni et al., 2018).

METHODS

The study area was Kiambu County with collective 12 Sub-Counties with Juja randomly sampled. Juja has five wards with a heterogeneous population of approximately 3,768 children aged 6 years, (KDHS, 2014). The target population was 6-year-olds and their parents within the household in Juja. The sample size was calculated as follows Sample size determination formula by Fisher modified in 1998 (Jung., 2014) using:

$$1 + \frac{z^2 * p(1-p)}{e^2 N}$$

Where N- children population size = 3,768; p – Expected prevalence was unknown therefore the researcher used 50.0%; z – Standard normal value corresponding to 95% level of confidence was 1.96; e - Precision was 5% (0.05)

$$1 + \frac{1.96^2 * 0.5(1-0.5)}{e^2 * 3768} = 349$$

Sample Size = 349

An additional 10% to cater for non-response was added. 110% × 349 = 384 parent- child pairs.

Disproportionate to size stratified sampling was used to determine the sample size from each ward to ensure an adequate number of respondents even from the smallest group in the population. Due to paucity of data on the number of 6-year-old households per ward, an even division of the total sample size between the wards was preferred.

Total sample size= 384 Total number of wards= 4 Thus 384÷4 = 96

The researcher targeted an equal number of parent- child pairs in each of the study wards and ensured that the questionnaire covered both father and mother in the households that had all parents present at the time of the interview. The pre-test sample of 40 (10%) respondents was done in Weiteithie. A sampling frame for the specific households was requested from the chiefs' offices to aid the researcher in sampling of the parent-child pairs within the ward. According to Agarwal, a response rate of 60.0% was adequate for scrutiny and for making interpretations about a population (Fincham, 2008; Gaur et al., 2020).

A researcher-administered questionnaire that was structured and validated was used to collect data on demographics and socio-economic characteristics, food choices and dietary diversity of the index child. The respondents were asked to recall the likes and dislikes of the foods offered to the index child. The research assistants were

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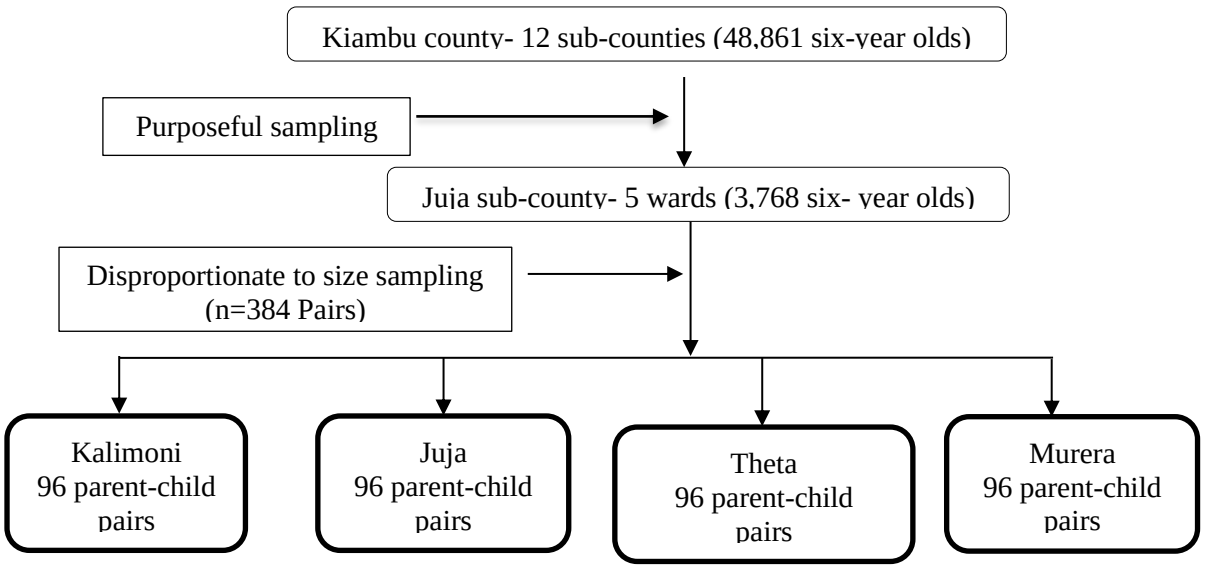
advised to probe the respondent to get all the information on their reasons for choosing specific foods over others. The nutritional status of the children was calculated from the weight, height and age of the children which was collected using the standio-meter seca scale.

Figure 1: Sampling Procedure



Department of Food, Nutrition and Dietetics Supervisors and nutritional specialists of Kenyatta University reviewed and ascertained accuracy and validity of the research tools. Reliability of the tools in generating similar outcomes when re-used was checked using the test-retest method. Tools of research were re-administered after 7 days to the same test group and an assessment of the answers obtained before an inference was made by looking at the test-retest correlation of the scores. Pearson's' correlation value of more than 0.8 was considered acceptable (Kent State University, 2015; Yeager, 2018).

SPSS software version 26.0 was used to analyse the data with significance $p<0.05$. The anthropometry data was analyzed using WHO Anthro-plus Survey Analyzer and compared to WHO (2009) growth standards with indices as follows; Stunting, underweight and thinness were defined as HAZ, WAZ and BAZ respectively. A Z score of Ƶ ≤-3SD was classified as severely stunting and severely under-weight while Ƶ <-3SD was classified as severe thinness, while those with Z scores <-2SD Ƶ >-3SD was considered moderate stunting, underweight and thinness respectively. A Z-score of >+1SD Ƶ <+2SD was considered overweight >+2SD Ƶ <+3SD was considered as obese and Ƶ >+3SD as severely obese. Chi-square test (χ^2) was used to test the association between categorical variables while Pearson's correlation (r) was used to establish association.

RESULTS

All children admitted to receiving a reward in form of songs, praise words, favourite snack, permission to play outside, reinstatement of privileges, watching favourite programs, prolonged play time and delayed bedtime as incentives to feed while majority of them admitted to being punished by use of threats with an elevated tone, grounding, withdrawal of privileges and infliction of physical pain when they refused to feed. Less than an eighth of the children admitted to never having been punished by the parents for refusing to eat. Less than half the parents admitted to applying all (grounding, issuing threats, inflicting physical pain and withdrawing privileges) forms of punishment depending on the severity of the action warranting the punishment while majority of fathers avoided punishing the index child on food related matters preferring to use threats instead. Majority of mothers and slightly more than a third of fathers

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said they learned the art of reward and punishment from their parents and older siblings but also from social media, friends, workmates, school, religion and religious books.

Table 1: Reward and punishment adopted as reported by the study children and adopted by the parents

Variable		Children N=348(%)	Reported by Children		Adopted by Parents	
			Mother N=328(%)	Father N=280(%)	Mother N=328(%)	Father N=280(%)
No. of rewarded children		348 (100)	328 (100)	280(100)	328(100)	280(100)
Type of Reward	Gift, praise & special permissions	209 (60.1)	198 (60.4)	171(61.0)	198(60.4)	171(61.0)
	Gifts only	25 (7.2)	23 (6.8)	19(6.7)	23(6.8)	19(6.7)
	Praise only	92 (26.4)	43 (13.2)	36(12.8)	43(13.2)	36(12.8)
	Others only	22 (6.3)	64 (19.6)	56(19.5)	64(19.6)	56(19.5)
	No. of punished children	320 (92.0)	320 (97.6)	30(10.7)	320(97.6)	30(10.7)
Type of punishment	Threats, grounding, inflicting pain & withdrawal of privileges	193 (60.3)	192 (60.1)	3(10.1)	192(60.1)	3(10.1)
	Grounding only	9 (2.8)	6 (1.9)	7(23.3)	6(1.9)	7(23.3)
	Issuing threats only	53 (16.6)	51 (15.9)	13(43.3)	51(15.9)	13(43.3)
	Inflicting physical pain only	65 (20.3)	71 (22.1)	7(23.3)	71(22.1)	7(23.3)
	None	28 (8.0)	8 (2.3)	250(89.3)	8(2.3)	250(89.3)

Food Choices as Reported by the Parent-Child Pair

Almost all the index children said that their food choices were shaped by the rewards and punishment that the parents applied on them resulting in them having a positive responded to food and drink plus a positive emotional reaction towards new foods. All parents interviewed said that their children's food choices were shaped by the rewarding and punishment they applied while more than two-thirds said that siblings, peers, social media and other environmental aspects like allergies affected their children's food choices as well. Majority of mothers and almost two-third of fathers admitted that reward and punishment improved the children's feeding as they cleared their plates and almost two-third of fathers and half of mothers said that children ate foods they previously did not fancy.

Table 2: Findings on food choices as reported by the study children and their parents

Food choice Parameters		Total Children N=348 (%)	Mothers, N=328(%)	Fathers, N=280(%)
Shaping of the food choices**	Parents (reward and punishment)	333(95.7)	328(100)	280(100)
	Siblings	218(62.6)	225(68.6)	215(76.8)
	Peers	321(92.2)	310(94.5)	236(84.3)
	Social media	250(71.8)	296(90.2)	252(90.0)
	Environmental factors	217(62.4)	227(69.2)	238(85.0)
		Reported by children	**Reported by parents**	
			Girls N=181(%)	**Boys N=167(%)**
Eating Behaviour	Enjoys food	310(89.1)	98(54.1)	102(61.1)
	positive emotion & satiety	186(53.4)	106(58.6)	94(56.3)
	high drinking desire	206(59.2)	122(67.4)	89(53.3)
	positive response to new foods	197(56.6)	103(56.9)	102(61.1)
	Doesn't enjoy food,	98(28.2)	83(45.9)	65(38.9)
	negative emotions and fussiness	157(45.1)	75(41.4)	73(43.7)
	Low drinking desire	165(47.4)	59(29.8)	78(46.7)
	Negative response to new foods	159(45.7)	78(43.1)	65(38.9)

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Nutritional Status of the study Children

Wasting/Thinness BMI-for-Age Z score (BAZ)

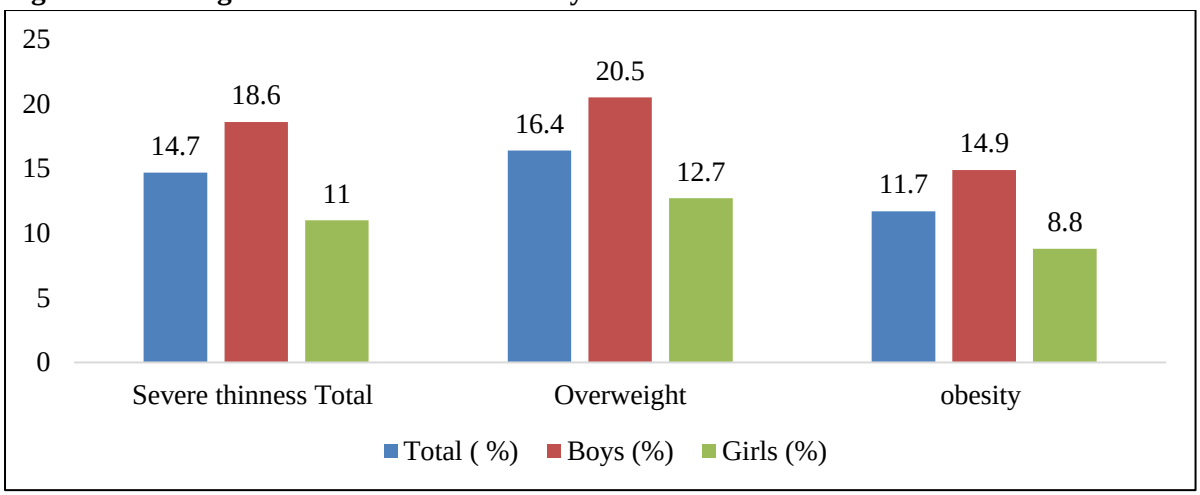
A minority of the children were thin for their age, overweight and obese with a mean Z score of 2.7±1.6.

Table 3: Wasting/ thinness status of the study children

Anthropometric Indices		Total n=348(%)	Boys n=167(%)	Girls n=181(%)
Wasting/ Thinness	Mean Z score (SD)	2.71	2.89	2.54
	Severe thinness (BAZ < -3)	9 (2.6)	5 (2.9)	4(2.2)
	Thinness (< -2 BAZ >-3)	42(12.0)	26(15.6)	16(8.8)
	Total (severe & thinness)	51(14.7)	31(18.6)	20(11.0)
	Normal (-2≤ BAZ < +1)	199(57.2)	77(46.1)	122(67.5)
	Overweight (+1 > BAZ < +2)	57(16.4)	34(20.5)	23(12.7)
	Obesity (BAZ > +2)	41(11.7)	25(14.9)	16(8.8)

Cut-off points based on WHO (2009) growth standards

Figure 2: Wasting/ thinness status of the study children



Stunting (HAZ)

A minority of the children of whom 8.3% were boys and 5.6% girls were exceptionally short for age showing that they were stunted with a mean score of -0.9± 1.3.

Table 4: Stunting Status of the Study Children

Anthropometric Indices		Total n=348(%)	Boys n=167(%)	Girls n=181(%)
Stunting	Mean Z score?	-0.98	-0.74	-1.19
	Severe stunting (HAZ≤ - 3)	8 (2.3)	5 (2.9)	3 (1.7)
	Moderate (-2<HAZ >-3)	16(4.6)	9(5.4)	7(3.9)
	Total (severe & moderate)	24(6.9)	14(8.3)	10(5.6)
	Marginal (-2<HAZ <-1)	26(7.5)	17(10.2)	9(4.9)
	Normal (-1<HAZ <0)	298(85.6)	136(81.4)	162(89.5)

Cut-off points based on WHO (2009) growth standards

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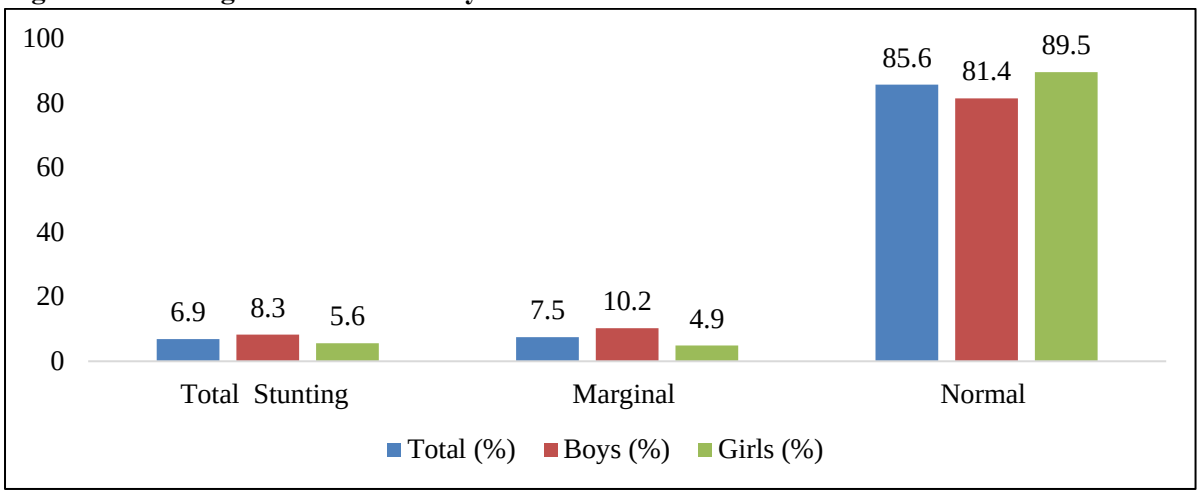
Figure 3: Stunting Status of the Study Children's



Underweight (WAZ)

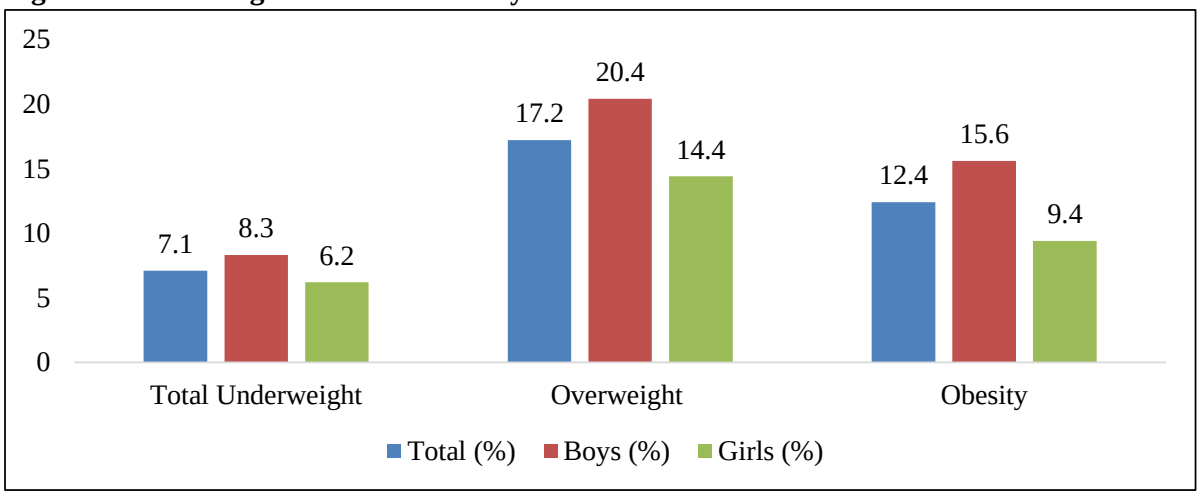
A minority of the study children were light for their age, a few were heavy for their age and fewer were obese with a mean score of 1.5 ±1.0.

Table 5: Underweight status of the study children

Anthropometric Indices		Total n=348(%)	Boys n=167(%)	Girls n=181(%)
Underweight	Mean Z score (SD)	1.48	1.73	1.25
	Severe underweight (WAZ ≤-3)	10 (2.8)	5 (2.9)	5 (2.9)
	Moderate (-2<WAZ> -3)	15(4.3)	9(5.4)	6(3.3)
	Total (severe & moderate)	25(7.1)	14(8.3)	11(6.2)
	Marginal ((-2 ≥WAZ< -1)	27(7.8)	17(10.2)	10(5.5)
	Normal (-1≥WAZ< +1)	193(55.5)	76(45.5)	117(64.6)
	Overweight (+1 >WAZ<+2)	60(17.2)	34(20.4)	26(14.4)
	Obesity (WAZ >+2)	43(12.4)	26(15.6)	17(9.4)

Cut-off points based on WHO (2009) growth standards

Figure 4: Underweight status of the study children



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Demographic and Socio-economic Characteristics and Parental Use of Reward and Punishment

There was a positive relation between the parent's age and punishment (P=0.05, x^2= 5.2) with majority of the parents above 37 years and with multiple children reporting that they punished, however, the younger parents below 29 reported rewarding (P=0.06, x^2= 3.9) more than punishing. There was a positive strong relationship between punishment and marital status (P=0.05, x^2= 9.6) with more of the married parents reporting that they punish while majority of the single parents reported rewarding their children and avoiding punishment. There was a positive medium relationship between punishment and the education level (P=0.04, x^2= 5.4) and income (P=0.06, x^2= 3.9) of the parents with more of the tertiary educated preferring to reward while two-thirds of the highly paid parents reported rewarding their children more often than they punished. There was a positive strong relationship between reward and food choices (P=0.06, x^2= 4.3) with almost all the study children and parents reporting that reward indirectly related to children's food choices, however, punished children had healthier food choices (P=0.05, x^2= 4.7) than the rewarded children in general.

Table 6: Relationship between demographic and socio-economic characteristics and parental use of reward and punishment

Demographic and Socio-Economic characteristics	Reward	Punishment	Odds Ratio (OR)	95% CI		P-Value
				Lower	Higher	
Boys	167	152	1.02	0.75	1.38	0.05
Girls	181	168				
Older parents	452	262	1.01	0.75	1.36	
Younger Parents	156	91				
Married parents	432	251	0.99	0.75	1.33	
Single Parents	176	102				
Tertiary Education	452	262	0.99	0.74	1.34	
Lower Education	156	90				
Have an Occupation	517	299	1.01	0.70	1.45	
No Occupation	91	53				
High Income	516	299	0.99	0.69	1.43	
Low Income	92	53				

Demographic and Socio-economic Characteristics and Nutritional Status of the Study Children

There was a significant relation between the parent's age and nutritional status with the odds of the older parents having more children who have a normal weight for age being higher in comparison with the younger parents (OR=1.13, 95% CI =0.50, 2.57), the odds of older parents having children with normal height for age (OR=5.21, 95% CI =2.09, 12.96) and normal BMI for age (OR=2.98, 95% CI =1.63, 5.47) was higher compared to the single parents. The odds of the married parents having more children who had a normal weight for age was higher in comparison with the single parents (OR=2.40, 95% CI =1.04, 5.53), the odds of married parents having children with normal height for age (OR=3.27, 95% CI =1.27, 8.45) and normal BMI for age (OR=2.15, 95% CI =1.15, 4.02) was higher compared to the single parents.

The odds of the higher educated parents having more children who have a normal weight for age was higher in comparison to the lower education parents (OR=2.59, 95% CI =1.09, 6.17), the odds of higher educated parents having children with normal height for age (OR=4.14, 95% CI =1.51, 11.36) and normal BMI for age (OR=1.45, 95% CI =0.80, 2.63) was higher compared to the lower education parents. The odds of the lower paid parents having more children who had a normal weight for age was higher in comparison with the

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high-income parents (OR=0.77, 95% CI =0.34, 1.76), the odds of lower paid parents having children with normal height for age was higher in comparison with the high-income parents (OR=1.05, 95% CI =0.46, 2.41).

Table 7: Relationship between Demographic and Socio-Economic Characteristics with Nutritional Status of the Study Children

Demographic and Socio-Economic characteristics	Normal WAZ	Poor WAZ	Odds Ratio (OR)	95% CI Lower	95% CI Higher	P-Value
Older parents	171	11	1.13	0.50	2.57	0.047
Younger Parents	152	14				
Married parents	199	10	2.40	1.04	5.53	
Single Parents	124	15				
Tertiary Education	179	08	2.59	1.09	6.17	
Lower Education	147	17				
Have an Occupation	159	13	0.89	0.39	2.02	
No Occupation	164	12				
High Income	173	15	0.77	0.34	1.76	
Low Income	150	10				
Demographic and Socio-Economic characteristics	**Normal HAZ**	**Poor HAZ**	**Odds Ratio (OR)**	**95% CI Lower**	**95% CI Higher**	**P-Value**
Older parents	221	07	5.21	2.09	12.96	0.042
Younger Parents	103	17				
Married parents	169	06	3.27	1.27	8.45	
Single Parents	155	18				
Tertiary Education	169	05	4.14	1.51	11.36	
Lower Education	155	19				
Have an Occupation	168	09	1.79	0.76	4.21	
No Occupation	156	15				
High Income	166	12	1.05	0.46	2.41	
Low Income	158	12				
Demographic and Socio-Economic characteristics	**Normal BAZ**	**Poor BAZ**	**Odds Ratio (OR)**	**95% CI Lower**	**95% CI Higher**	**P-Value**
Older parents	206	22	2.98	1.63	5.47	0.048
Younger Parents	91	29				
Married parents	154	17	2.15	1.15	4.02	
Single Parents	143	34				
Tertiary Education	184	27	1.45	0.80	2.63	
Lower Education	113	24				
Have an Occupation	165	30	0.89	0.48	1.60	
No Occupation	132	21				
High Income	149	40	0.27	0.14	0.56	
Low Income	148	11				

Food Choices and Nutritional Status of the Study Children

There was a positive strong relationship between food choices (P=0.04, x^2= 5.6) and nutritional status with almost all children and parent's reporting that food choices related to their nutritional status directly.

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Table 8: Relationship between Food Choices and Nutritional Status of the Study Children

Nutritional Status	Healthy Food Choices	Poor Food Choices	Odds Ratio (OR)	95% CI		P-Value
				Lower	Higher	
Normal WAZ	193	2	3.94	0.78	19.80	0.04
Poor WAZ	147	6				
Normal HAZ	298	4	7.10	1.71	29.44	
Poor HAZ	42	4				
Normal BAZ	199	3	2.35	0.55	10.00	
Poor BAZ	141	5				

DISCUSSION

According to the Kenyan census report, the average household size as of 2019 was 3.9 a fact that was very evident during data collection, where average household size was 5± 1.7SD (Kenya National Bureau of Statistics, 2019). Among the homes studied, majority had married couples with females in their thirties and males in their late thirties and early forties and an age difference of 3-5 years being most common. A few of the remaining homes had couples with a similar age and even fewer had older women with younger spouces. Majority of the older (OR=1.01) and married (OR=0.99) parents punished their children more than their counterparts while the higher educated parents with higher income didn't punish their children as often where feeding was concerned. A higher percentage of mothers than fathers threatened and punished their children. Comparing the demographic characteristics of the mothers to those of the fathers gave a chi-square statistic of 44.44 and a p-value = 0.00001 which was Significant at $p < .05$ and socio-economic characters gave a chi-square statistic of 33.35 and a p-value = 0.00001 also significant at $p < .05$. More of the children with normal WAZ, HAZ and BAZ belonged to older and married parents. The odds of the educated parents having healthier children was higher compared to the low educated parents, however the low-income parents had a greater odd of having healthier children compared to the highly paid parents.

All study children admitted to being rewarded and majority of them admitted to being punished while a minority admitted to never being punished to feed. The common rewards were in form of songs, praise words, favourite snack, permission to play outside, reinstatement of privileges, permission to watch favourite programs, prolonged play time and delayed bed time as incentives while the punishments entailed threats with an elevated tone and withdrawal of privileges from both parents, grounding by the fathers and inflicting physical pain from the mothers. Majority of children stated that their food choices were shaped by the parental reward and punishment. The parents reported having learned to reward and punish from their parents but also from their older siblings, social media, friends, workmates, school, religion and religious books.

Children having picked on these family dynamics and learned their parents preferred approach to food altered their food choices encouraging reward and avoiding punishment from the parents. The children who received both rewards and punishment showed an improvement in their appetite, their food choices, their nutritional status and had a positive approach to introduction of new foods while those that were only punished fed out of fear and grew to dislike the food more proving that a combination is more effective than the use of one over the other. The parents reported that rewarding or punishing the study children in relation to food had no relation to their dietary diversity at the time of the interviews as diet diversity was influenced more by affordability, availability, accessibility and acceptability of the food items in the local market (Hailemariam et al., 2018b). Children of mothers with the lowest education levels had the lowest dietary diversity scores but majority of the study children met the recommended IDDS. BAZ was not affected by parent education level, occupation or ethnic affiliation, however, dietary diversity developed within the households was influenced by the community, local food cuisine, family

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demographics and socioeconomic factors that the children had no control over supporting the second hypothesis that parental use of reward and punishment had no significant relationship to dietary diversity of the study children.

Nutritional status by gender showed that more boys than girls were malnourished for the indicators; 8.3% boys compared to 5.6 % girls for stunting, 8.3% compared to 6.1% for thinness, 8.3% compared to 6.2% for underweight, 20.4% compared to 14.4% for overweight and 15.6% compared to 9.4% for obesity respectively. The study revealed that the prevalence of stunting, thinness and underweight was 6.9%, 7.2% and 7.1% respectively compared to the county population which stands at 15.7%, 5.1% and 5.6% respectively (KNBS, 2019; MoH-Kenya, 2015). On average, about two-thirds of the children were well nourished. The nutritional information from the parents, siblings, peers or social media was affected by ethnicity, religious beliefs, socio-economic factors, parents' approach to the meals (reward and punishments) and medical conditions among others and was skewed to favor some food group over others with no regard for the nutrient value of the said foods resulting in altered food choices, altered dietary diversity and compromised nutritional status.

CONCLUSION

The findings revealed that demographic and socio-economic characteristics had a strong positive relationship to food choices, dietary diversity and nutritional status of the study children in Juja Sub-County while reward and punishment had a strong positive relationship to food choices and nutritional status and no relationship to dietary diversity, however, reward and punishment, food choice and dietary diversity all had a strong relationship to nutritional status of the study children. The use of rewards and punishments to strengthen or eliminate a behavior in food undermined the healthy food choices that the children might have developed with time but getting children to eat a variety of nutritious healthy foods was a challenge and forcing the children to eat seemed like an easier option for parents to leaving the children hungry (Mutuura Caroline, n.d.; N.V. et al., 2018).

The findings also revealed that positive rein-forcers used by the parents increased the likelihood of behavioral response from the study children (Epstein et al., 2007; Mcleod, 2018). Immediate punishment showed decrease in undesirable behaviors while feeding and had taught some of the children fear while others become more aggressive and resistant to feeding. The odds of healthy nutritional status for children who were both rewarded and punished were higher (OR= 1.01) compared to poor nutritional status for the same study group. Withdrawal from specific foods by the study children was due to medical conditions like food allergies following directives from the study children's medical specialists. The study children's report on commitment not to skip meals due to the expected reward and punishment from the parents had enabled majority of the children to feed and by feeding they had maintained or improved their nutritional status. The findings rejected four of the null hypotheses showing that there was a strong relationship between the independent variables and the dependent variables of the study.

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