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## **COMPARATIVE STUDY OF FEEDING PRACTICES OF MOTHERS AND STUNTING AMONG UNDER-5 CHILDREN IN UPLAND/RIVERINE AREAS OF RIVERS STATE**

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### **Abstract**

Feeding is a substantial factor influencing the growth and development of every child. The Nigerian child increasingly faces risks of stunting due to poor feeding. This risk is worsened in locations with accessibility constraints. This study aimed at understanding the regional variations in the Feeding Practice (FP) of mothers and the prevalence of stunting in children living in Rivers state. A cross-sectional survey was adopted to collect data from 316 mother/child pairs using a stratified random sampling method. Information on maternal socio-economic status, dietary history of the children, weight and height measurements were recorded. On a 26-point scale, FP was classified as poor (<9), fair (9 - 18) and good (>18). Descriptive and inferential statistics were used to analyse the data collected. The WHO Athro software was used to obtain the Z scores for stunting. The results showed that the mothers in the two areas were about  $29 \pm 5$  years and had a minimum of secondary education (about 70.1%). The upland/riverine practice of good FP were 45.9% and 52.0% respectively. Although majority of the children were normal (70.6% and 65.3%), stunting was higher in the riverine area (32.7%) than in the upland area (28.0%). Feeding children patiently ( $p = 0.026$ ) and fortified meals ( $p = 0.013$ ) in the upland and serving food on separate plates ( $p = 0.006$ ) alongside feeding thick-enriched pap ( $p = 0.001$ ) in the riverine area positively correlated with height-for-age. Therefore, mothers should endeavour to patiently feed their children more frequently with fortified meals.

### **Keywords:**

*Feeding practice, stunting, under-5 children.*

### **INTRODUCTION**

Infant and young child feeding is a substantial factor influencing the growth and development of every child. Feeding practice comprises of the arrangement adopted by someone in order to provide food to someone who is in needs of it. Infant and young children are dependent on adults so should be adequately fed. UNICEF (2016) and WHO (2023) instruct that infant feeding is very

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critical for their growth, development, health and safety. Udoh and Amodu (2016) informed that optimum infant feeding practice is a substantial factor influencing the growth and development of a child. Despite the energies deployed by UNICEF and WHO in encouraging breastfeeding as one of the major components of its strategy to improve child survival (1998), Nigeria still has a high rate of stunting. The NDHS report 2013 reported figures as high as 22.6% for boys and 19.6% for girls respectively (NPC, 2014). The 2023 Nigeria Demographic and Health Survey (NDHS) reports that, 40% of children are stunted in Nigeria and 22.5% stunting is in the South South (Federal Ministry of Health and Social Welfare of Nigeria (FMoHSW), National Population Commission (NPC) [Nigeria], and ICF., 2024), Davies-Adetugbo et al., (1997) observed that promoting breast-feeding proves to be an important intervention plan for the control and proper management of diarrhoea; remarking that it is a crucial child survival strategy, with exclusive breastfeeding offering the greatest protection. It has been observed that Nigerian mothers breastfeed their infants but exclusive breastfeeding still lacks local credibility (Davies-Adetugbo et al., 1997). The findings of a study by Kamau-Thuita et. al. (2002) revealed that stunting in children was more with children who were briefly breastfed, and lower feeding frequency when compared with those who were not stunted. The nutritional status of the infants and young children in Rivers East Senatorial district was found to have a positive significant relationship with the feeding practice by Azuonwu and Salome (2021). Feeding practice therefore affects the nutritional wellbeing of everyone including children.

### **Objectives of the Study**

The objectives of this study were to:

1. assess stunting status of under-five children in Rivers state
2. assess the feeding practice of under-five children in Rivers state
3. compare the feeding practices of mothers and stunting status among under-5 children in upland/riverine areas of rivers state

### **METHODOLOGY**

A cross-sectional survey was adopted to collect data from 316 mother/child pairs in six selected Local Government Areas (LGAs) using a stratified random sampling method. The study area (Rivers state) was stratified based on Upland/Riverine regions. Among the twenty-three LGAs in the state, fifteen are considered upland areas while eight are considered riverine areas. A ratio of 2:1 was used to randomly select four LGAs in the upland area and two LGAs in the riverine area. The children were between the ages of six to fifty-nine (6 - 59) months old. A pretested semi-structured interviewer-administered questionnaire was used to obtain information on maternal socio-economic status, dietary intake of the children, weight and height measurements of both mother and child were recorded. Informed consent was obtained from all the mothers who participated. The informed consent form was translated to Pidgin English language because the state is a multilingual state and the Pidgin English language was widely spoken and understood by everyone who could verbally communicate in that region. Other tools used were; weighing balance, tapes and length meters for anthropometric measurements of mother and child pairs, gift items as compensation for participating. On a 26-point scale, feeding practice was classified as poor (<9), fair (9 - 18) and good (>18). Means and standard deviation were used to describe the

data and Pearson correlation and binary logistics were used to obtain the inferential statistics on the data collected. The WHO Athro software was used to obtain the Z scores for stunting.

## RESULTS

Table 1 shows the demographic characteristics of the mother/child pairs. The results showed that the mothers in the two areas were about  $29 \pm 5$  years and had a minimum of secondary education (about 70.1%). There were more single mothers (25.5%) in the riverine area than in the upland area (13.3%). Income less than ₦40,000.00 was lower in the upland area (58.7%) than in the riverine area (68.4%). The prevalence of stunting was observed to be 28.0% in the upland 32.7% in the riverine area.

Table 2 presents the feeding practice of mothers. Majority (88.29%) of the mothers received breastfeeding counselling and about 40% exclusively breastfed their children for six months. A significant difference ( $p < 0.05$ ) was observed between feeding the child at least three times a day, feeding infant directly and serving food on separate plates between the two groups. Exclusive breastfeeding for six months had a prevalence of about 41% and 35% respectively in the upland and riverine areas but majority (88.29%) of the mothers received breastfeeding counselling. A greater proportion (56.1%) of mothers in the riverine areas fed family food at least three times a day while feeding meals with adequate fat content was more common among mothers in the upland group (88.1%). Serving child's food on separate plate was practiced more among mothers in the riverine area (83.7%). Minimum dietary diversity was lower in the riverine area (79.6%) than in the upland area (83.0%).

Table 3 shows that the more mothers fed infants directly, the lower the stunting among the children.

Table 4 presents the logistic regression of maternal feeding practice and stunting status of the U-5 children. It was observed that children who were fed slowly and patiently were less likely to be stunted in the upland (OR: .421, CI: .180-.980) area while in the riverine area children who were fed with no watery foods (OR: 233, CI: 074-.735), fed slowly and patiently (OR: .116, CI: .017-.079) were less likely to be stunted.

Figure 1 presents the categorization of feeding practice. It reveals that mothers who had good feeding practice were more in the riverine area (52.0%) than in the upland area (45.9%) while fair feeding practice was more in the upland area (54.1%) though not significantly. This implies that mothers in Rivers state show similar feeding practice regardless of the place of residence (upland or riverine).

## TABLES AND FIGURES

Table 1: Demographic Characteristics of the Mother/Child pairs

	Variables	Total 316 (100%)	Upland 218 (100%)	Riverine 98 (100%)
<b>Mother</b>	<b>Mean age</b>	29.03±5.66	29.18±5.57	28.87±5.88
	<b>Age range</b>	16-48	16-48	16-46
	< 20	9(2.9)	7(3.2)	2(2.0)
	20-24years	61(19.3)	38(17.4)	23(23.5)
	25-29years	107(33.9)	72(33.0)	35(35.7)
	30-34years	85(26.9)	63(28.9)	22(22.4)
	35-39years	43(13.6)	31(14.2)	12(12.2)
	≥ 40	11(3.5)	7(3.2)	4(4.1)
	<b>Marital Status</b>			
	Single	54(17.1)	29(13.3)	25(25.5)
	Married	262(82.9)	189(86.7)	73(74.5)
	<b>Educational level</b>			
	No formal	5(1.6)	2(0.9)	3(3.1)
	Primary	47(14.9)	29(12.8)	18(18.4)
	Secondary	224(70.9)	154(70.6)	70(71.4)
	Tertiary	40(12.7)	34(15.6)	7(7.1)
<b>Maternal Income</b>				
≤#40,000	195(61.7)	128(58.7)	67(68.4)	
#41,000-80,000	73(33.5)	56(57.1)	36(36.7)	
> #80,000	48(15.2)	34(15.6)	14(14.3)	
<b>Child</b>	<b>Mean age</b>	25.49±14.75	27.20±15.06	21.7±13.36
	6-23mths	165(52.2)	109(50.0)	57(57.1)
	24 -59mths	151(47.8)	109(50.0)	42(42.9)
	<b>Gender</b>			
	Male	155(49.1)	108(49.5)	47(48.0)
	Female	161(50.9)	110(50.5)	51(52.0)
	<b>Type of birth</b>			
	Singleton	305(96.5)	209(95.9)	96(98.0)
	Multiple birth	11(3.5)	9(4.1)	2(2.0)
	<b>Height for Age</b>			
	Severe (<-3SD)	45(14.2)	26(11.9)	19(19.4)
Mild (≤ -2SD to ≤ -3SD)	48(15.2)	35(16.1)	13(13.3)	
Normal (>-2SD to 2SD)	195(61.7)	139(63.8)	56(57.1)	
(≤ 2SD to ≤ 3SD)	14(4.4)	7(3.2)	7(7.1)	
(>3SD)	14(4.4)	11(5.0)	3(3.1)	

**Table 2: Feeding Practice of Mothers**

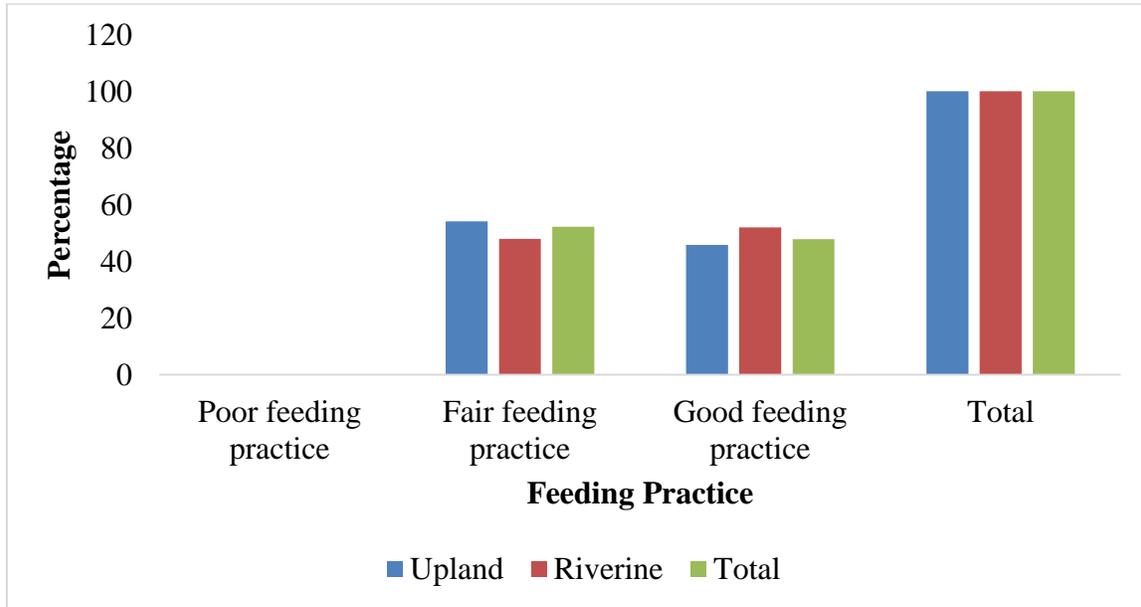
<b>Feeding Practice</b>	<b>Total 316(100%)</b>	<b>Upland 218(100%)</b>	<b>Riverine 98(100%)</b>	<b>X<sup>2</sup></b>	<b>p-value</b>
<b>Duration of EBF in months</b>				3.16	.789
<6	191(60.4)	128(58.7)	63(64.3)		
6	125(39.6)	90(41.3)	35(35.7)		
<b>Complementary Feed introduction</b>				11.93	.154
<6	178(56.3)	117(53.7)	61(62.2)		
6	130(41.1)	95(43.6)	35(35.7)		
>6	8(2.5)	6(1.8)	2(2.0)		
<b>Received breastfeeding Counselling</b>	279(88.3)	22(10.1)	15(15.3)		
<b>Breastfeeding duration</b>				10.22	.037
<6 months	10(3.2)	4(1.8)	6(6.1)		
6-11 months	89(28.2)	54(24.8)	35(35.7)		
12-18 months	196(62.0)	146(67.0)	50(51.0)		
19- 24 months	21(6.7)	14(6.4)	7(7.1)		
Mean duration	12.57±4.30	12.89±4.00	11.84±4.85		
<b>Breastfed before complementary food</b>	190(60.1)	120(55.1)	70(71.4)	7.57	.006
<b>Common complementary feed</b>					
Pap + milk	196(62.0)	127(58.3)	69(70.4)		
Only pap	60(19.0)	51(23.4)	9(9.2)		
<b>Served food on separate plates</b>	241(76.3)	159(72.9)	82(83.7)	4.306	0.045
<b>Fed infants slowly</b>	279(88.3)	185(84.9)	90(91.8)	4.438	0.109
<b>Fed thick and enriched pap</b>	208(65.8)	146(67.0)	62(63.3)	.413	.302
<b>Minimised distraction while feeding</b>	280(88.6)	198(90.8)	82(83.7)	3.426	0.084
<b>Avoided drinks with low nutritive value</b>	178(56.3)	119(54.6)	59(60.2)	0.867	0.392
<b>Daily intake of fruits/vegetables</b>	237(75.0)	164(75.2)	73(74.5)	0.020	0.889
<b>Fed meals with fat content</b>	269(85.1)	192(88.1)	77(78.6)	5.21	.074
<b>Fed child at least 3x a day</b>	176(55.7)	121(55.5)	55(56.1)	12.307	.001
<b>Met MMF</b>	175(55.4)	121(55.5)	55(55.1)		

**Table 3: The Pearson Correlation Coefficients of the Variables**

Place of residence/ Variable	Stunting	Height-for-Age zscore	
Upland	Stunting	1	-0.112
	Height for Age z score	-0.112	1
	Gave only pap	-0.137*	0.082
	EBF for 6months	0.001	0.114
	Receive BF counselling	-0.074	0.038
	Fed thick and enriched pap	-0.063	0.350*
	Daily intake of fruits and vegetables	-0.063	0.194**
	Fed meals with adequate fat content	0.083	0.049
	Avoided drinks with low nutritive value	-0.055	0.061
	Fed infant directly	-0.259**	-0.003
	Fed infant slowly and patiently	-0.149*	0.151*
	Fed fortified foods	0.047	0.203*
	Served food on separate plate	-0.007	0.151*
Riverine	Stunting	1	-0.124
	Height for Age z score	-0.124	1
	Gave only pap	0.017	0.003
	EBF for 6months	0.015	0.142
	Received BF counselling	-0.099	0.211*
	Fed thick and enriched pap	0.04	0.463*
	Ensured that foods must not be watery	-0.238*	0.105
	Daily intake of fruits and vegetables	-0.073	0.038
	Fed meals with adequate fat content	-0.112	0.04
	Avoided drinks with low nutritive value	-0.029	0.173
	Fed infant directly	-0.075	-0.187
	Fed infant slowly and patiently	-0.171	-0.18
	Fed fortified foods	-0.017	-0.035
Served food on separate plate	-0.073	0.274**	

**Table 4: Logistic Regression of Maternal Feeding Practice and Stunting Status of the U-5 Children**

Place of residence		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
<b>Upland</b>	fat_content	.608	.572	1.130	1	.288	1.837	.598	5.641
	feed_thick_pap	-.120	.343	.124	1	.725	.886	.453	1.735
	no_watery_foods	.151	.392	.149	1	.699	1.163	.540	2.507
	adeq_fd_density	.798	.580	1.891	1	.169	2.221	.712	6.923
	daily_fruits_veges	-.231	.388	.353	1	.553	.794	.371	1.699
	slow_and_patient_feeding	-.866	.433	4.005	1	<b>.045</b>	.421	.180	.982
<b>Riverine</b>	fat_content	-.129	.698	.034	1	.853	.879	.224	3.453
	feed_thick_pap	.255	.520	.241	1	.624	1.291	.466	3.576
	no_watery_foods	-	.585	6.175	1	<b>.013</b>	.233	.074	.735
	adeq_fd_density	.832	.663	1.573	1	.210	2.298	.626	8.434
	daily_fruits_veges	-.413	.636	.421	1	.517	.662	.190	2.304
	slow_and_patient_feeding	-	.979	4.845	1	<b>.028</b>	.116	.017	.790
		2.154							



**Figure 1: Feeding Practice Categorisation by Ranking**

## DISCUSSION

The results showed that the mothers in this study were young both in the upland and in the riverine areas. This demonstrates the need for guidance and support even though there are social, economic and health benefits associated with maternal youthfulness. Studies have shown that youthful populations have certain consequences that can be properly addressed with adequate support system (Udeh et al., 2023; Ruckwongpatr et al., 2022; Cahil & Gowing, 2024). Cohabitation is a traditionally accepted practice in the riverine areas of Rivers state. This might be responsible for the high proportion of single mothers observed in that region. This may hold adverse consequences for children raised in such households especially where resources are minimal (Hertz et al. 2020). The prevalence of stunting was observed to be high in the two regions but higher in the riverine area. According to Asiegbu and Ariyo (2024) the practice of open defecation is still high in the upland areas and very high in the riverine areas of Rivers state. This finding aligns with those of Rahman et al. (2020) and Luke et al. (2024) who posited that children are exposed to myriads of health challenges and a consequent malnutrition in areas with predominant open defecation.

Despite receiving breastfeeding counselling, exclusive breastfeeding in both upland and riverine areas were observed to be lower than the 50% WHO recommendation (UNICEF Nigeria, 2024) mark by 2025 but a little bit higher than the 29% prevalence in the country currently (NPC, 2024). This calls for a well-targeted action to promote the adoption of exclusive breastfeeding in Rivers state. A significant difference ( $p < 0.05$ ) was observed between feeding the child at least three times a day, feeding infant directly and serving food on separate plates between the two groups. This may be as a result of the employment status of mothers and their marital status. It is suspected that the more employed mothers were the less time they may have to attend to the children's feeding directly

The more mothers served food on separate plates, the lower the chances of having stunted children. Serving food on separate plates helps the mother or the caregiver to know the actual amount of food consumed by a child. This gives room to monitor food quantities consumed which is highly recommended (Federal Ministry of Nigeria, 2010).

Children who were fed slowly and patiently were less likely to be stunted in the upland (OR: .421, CI:.180-.980) area while in the riverine area children who were fed with no watery foods (OR:.233, CI: .074-.735), fed slowly and patiently (OR: .116, CI:.017-.079) were less likely to be stunted. This confirms the efficacy of the item on feeding infants slowly and patiently in the IYCN, (2010) guideline on infant and young child feeding practice.

Mothers who had good feeding practice were more in the riverine area (52.0%) than in the upland area (45.9%) while fair feeding practice was more in the upland area (54.1%) though not significantly. This implies that mothers in Rivers state show similar feeding practice regardless of the place of residence (upland or riverine).

## CONCLUSION

The prevalence of stunting was higher in the riverine area than in the upland area. Serving food on separate plates for children as well as feeding them slowly and patiently could improve their nutritional status. Mothers in Rivers state showed similar feeding practice regardless of the place of residence (upland or riverine). There is need to provide guidance and support to mothers in both upland and riverine areas since mothers were observed to be typically young.

## RECOMMENDATIONS

1. It is recommended that breastfeeding counselling should continue and more mothers should be encouraged and supported to receive this counselling.
2. Mothers in both upland and riverine areas should endeavour to serve food on separate plates for their children to ensure the child has sufficient food.
3. Mothers in both upland and riverine areas should also feed their children slowly and patiently to promote a positive relationship with food.

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