

ORIGINAL ARTICLE

Inequalities in nutritional status among under five children in Haryana state, India: Role of social determinants

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Abstract

Background: Under-nutrition is a major cause of ill health and childhood mortality in India. So far, little attempt has been made to assess whether improvements in nutritional status have masked widening socioeconomic inequalities or produced slower progress among the poor and the disadvantaged. **Aims & objective:** We undertook this study to estimate the burden of under-nutrition among children less than five years in four districts of Haryana and explore the inequalities in rates of malnutrition across different social and economic groups. **Material & Methods:** A community based cross-sectional survey was carried out in four districts of Haryana namely Ambala, Karnal, Panchkula and Yamunanagar. Multi-stage stratified random sampling technique was used to select 2763 children under 5 years of age. Standard anthropometric methods were used. Rates of underweight (WAZ \leq -2 z-score), wasting (WHZ \leq -2 z-score) and stunting (HAZ \leq -2 z-score) were estimated. Multivariate logistic regression was used to determine risk factors and evaluate inequalities across population by social and economic sub-groups. **Results:** The prevalence of underweight, stunting and wasting in four districts of Haryana was 37.4%, 38.2% and 16.4% respectively. Similarly, 12.7%, 13.2% and 3.5% of under-weight children were severely underweight, stunted and wasted respectively. The odds of underweight and stunting increased among the poorest by 2.3 and 1.8 times respectively as compared to the richest category. **Conclusion:** There is persistent problem of under-nutrition in Haryana mostly among the poor, uneducated, and among children of women who do not take ANC care/ breastfeed. Actions on social determinants need urgent prioritization.

Keywords

Child Health; Malnutrition; Underweight; Stunting; Wasting

Introduction

Globally under-nutrition is associated with almost half of all childhood deaths. (1) Although several

nutritional intervention programmes are in operation since the last few decades, under-nutrition is a major cause of ill health and childhood mortality in India. (2) The prevalence of underweight

children in India is among the highest in the world, and is nearly double as that of Sub-Saharan Africa. (3) According to National Family Health Survey-4 (NFHS-4) estimates, nearly 42% of children in India are stunted and 38% are underweight in rural areas. (4) India is home to 55 million of the world's underweight children under age five—about one-third of the global burden of underweight in this age group. (5)

With economic growth, socio-economic inequalities are on a rise in most countries and are higher today than in 1980. (6) India experienced rapid economic boom following the opening of its markets since the 1990s. But this economic growth and prosperity is not reflected in the nutritional status among the children in the country. Such type of growth fosters inequalities and a model of imbalanced growth and development. There is sufficient evidence to suggest that egalitarian societies are associated with higher levels of economic growth and political inclusion. By contrast unequal societies experience higher rates of crime, ill-health drug abuse and persistent poverty. (7)

While most health sector planning and implementation happens at district level in India, NFHS estimates are valid at state level. Their results have thus only a limited use if there were wide district variations.

Aims & Objectives

1. To estimate the burden of under-nutrition among children less than five years of age in four districts of Haryana.
2. To study the inequalities in rates of childhood malnutrition across social and economic groups which could allow us to critically analyse childhood nutrition policies with a public health perspective.

Material & Methods

Study setting and design: The state of Haryana is one of the wealthier states of India with the third highest per capita income in the country in the year 2012–13.(8) A community based cross-sectional survey was carried out in four districts of Haryana namely Ambala, Karnal, Panchkula and Yamunanagar in the year 2014. These districts were chosen purposively in order to assess the baseline nutritional status before Haryana Health Department implemented a pilot nutrition intervention programme in Ambala, Karnal and Panchkula. Yamunanagar district, because of similarity in socio-demographic profile of

its population to case districts, was selected to act as a control. A multi-stage stratified random sampling technique was adopted. In each district, 10% of Sub-Centre (SC) areas were selected randomly with representation from rural, urban and slum areas according to probability proportionate to size (PPS). A total of 40 children were selected from each sub-centre, who were divided equally among two randomly selected villages under the Sub-Centre. In case of more than one child under 5 years in a given household, any one child was selected randomly for inclusion in the study. Those children whose mothers did not give their consent for participation, or where the child was too sick or distressed or was physically deformed to the extent of creating interference in recording a correct measurement, were excluded from the study.

Sample size: Sample size was computed using software Open-Epi Version 2.3 for estimating association of underweight with a number of indicators. Overall the sample size was highest for assessing the association of exclusive breastfeeding with childhood under-nutrition. With power set at 80%, the confidence interval at 95%, the ratio of exposed to unexposed at 1, proportion of children exclusively breastfed among children with normal weight taken as 40% and the odds of breastfeeding among underweight children as compared to normal weighing children assumed to be 0.6, we estimated a sample size of 542 in each district (271 normal and 271 underweight children). With a design effect of 1.2 to adjust for stratification, the sample size was increased to 640 children in each of the three case districts. To compensate for presence of a single control district, sample size for Yamunanagar district was raised to 843, thus making a total of 2763 cases from four districts.

Data collection: Data on various socio-economic and demographic variables was collected from the parents using a structured questionnaire. Anthropometric measurements such as weight (up to nearest 1g, using TARE function), height (up to nearest 1 mm), and recumbent length in case of infants (up to nearest 1 mm) were carried out using standard equipment and procedures.(9,10,11) Nutritional assessment and classification was carried out using WHO Child Growth Standards according to z-score classification (WHO 1983).(12,13) Information on availability of various household assets was also collected from households to be used for computation of wealth index.

Data analysis: Measures of descriptive statistics like percentages were used to describe the burden of under-nutrition among under-five children. The results were stratified by various socio-demographic and household characteristics. A relative wealth index was estimated by principal component analysis (PCA) technique using the first principal component. An asset-based approach was used because it is said to depict a household's long-run economic status and is not influenced by short-term fluctuations in economic well-being or economic shocks. (14) Bivariate analysis was done to explore the determinants of malnutrition. Multivariate logistic regression analysis was performed to identify the risk factors of malnutrition adjusting for various confounders.

Ethical clearance: Ethical clearance was obtained from the Institute Ethics Committee of Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh. Administrative approval was taken from National Rural Health Mission (NRHM), Haryana. Written informed consent was obtained from the parents of the children included in the study.

Results

The socio-demographic profile of the families surveyed have been presented in table 1. 42.5% of the children studied were females, while 63.7% belonged to rural areas. A majority of the children belonged to 1-3 year age group (47.5%). (Table 1)

The prevalence of underweight, stunting and wasting was 37.4%, 38.2% and 16.4% respectively with 12.7%, 13.2% and 3.5% being severely underweight, stunted and wasted. (Table 2)

Prevalence of under-nutrition increased as age progressed with about half (46%) of the children in the 3-6 year age group being underweight and stunted. The prevalence of underweight was more among children of slum dwellers (44.6%), illiterate parents (53.6%), scheduled castes or tribes (SC/ST) (46.3%), poorest quintile (53.2%), daily wage labourers (46.8%), those practicing open defecation (50.5%) and those mothers who consumed less than 30 iron & folic acid (IFA) tablets during pregnancy (37.3%). All these variables were found to be significantly associated on bivariate analysis ($P < 0.001$) with weight of the children classified as normal or under-weight. (Table 2)

Place of residence, age of the child, education of the mother and wealth status were significant predictors

of both stunting and severe stunting. Children belonging to the poorest quintile had 2.3 (CI=1.6-3.3, $P < 0.001$) times higher odds of being underweight as compared to the children from highest wealth index. Similarly, those belonging to the scheduled castes and other backward castes had 1.6 (CI=1.3-2.0) and 1.4 (CI=1.1-1.8) times higher odds of being underweight as compared to the general caste. Compared to the 0-6 month age group, children belonging to the 1-3 and 3-5 year age group had significantly higher risk of suffering from both underweight and stunting. (Table 3) After controlling for the determinants of malnutrition which were significant in bivariate analysis, we found that age of the child, social group, education of the mother and wealth status were significant predictors of being underweight whereas age (only 1-3 years), education of the mother and wealth status were the significant predictors of severe underweight. Similarly, though urban residence and social group were significant predictors of wasting, they were not so in case of severe wasting. (Table 3)

Age and wealth status were the strongest predictors of severe under-nutrition, both underweight and stunting. Children belonging to the poorest quintile had 3.3 (CI=1.8-6.0, $p < 0.001$) and 2.4 (1.4-4.1, $p < 0.001$) times higher odds of being severe underweight and stunted respectively as compared to the children from highest wealth index. Compared to the 0-6 month age group, children belonging to the 1-3 and 3-6 year age group had significantly higher risk of suffering from both severe underweight and severe stunting. (Table 3)

Discussion

Overall, we found that 37.4%, 38.2% and 16.4% of under-5 year old children were underweight, stunted and wasted respectively. Nearly 12.7%, 13.2% and 3.5% of children were suffering from severe underweight, severe stunting and severe wasting respectively. Age of the child, wealth status and caste were significant determinants of malnutrition. This study brings to fore the role of social determinants like economic status, caste, maternal education in determining the nutritional status of child.

According to NFHS-3 estimates, the prevalence of underweight, stunting and wasting in Haryana was 39.6%, 45.7% and 19.1% respectively. (15) We found that the prevalence of acute and chronic malnutrition has remained almost similar during the

last 8 years in Haryana. The study results were also similar to a previous analysis in neighbouring Union Territory of Chandigarh where no decadal change in nutritional status of children was reported between 1997 and 2007. (16) A proposed link to this persistent levels of under-nutrition is the sustained and rather increasing levels of income inequality in the society, and low status of other social determinants. This calls for action on the front of social determinants, as envisaged in the Commission on Social Determinants of Health, i.e. improve daily living conditions; tackle the inequitable distribution of power, money and resources and; measure and understand the problem and assess the impact of action. (17)

Underweight and wasting was significantly higher among children born to lower caste families compared to those born to general category, highlighting inequalities similar to that reported in literature published earlier from India. (2,18,19) Another study looking at the trend of socio-economic disparities in childhood under-nutrition found that household wealth, caste, and maternal education were significant predictors of under-nutrition outcomes. There was no change in the pattern of the caste based disparities in under-nutrition between 1992 and 2005. (20) In the same study the author said that inequalities by wealth and education account for most of the caste-based disparities in under-nutrition. Children in the age group of 1-3 years and 3-5 years were found to have a greater risk of under-nutrition, both underweight and stunting similar to another study by Meshram *et al* in India who found that the risk was highest in the 1-3 year age group. (21) This might be due to faulty breastfeeding and child feeding practices and recurrent morbidities in the younger age group that results in poor nutritional status during the later period. Socio-economic development indicators like wealth index are strongly associated with under-nutrition which is supported by other studies. (20,21,22,23,24)

Maternal education was associated with nutritional outcomes among children. Previous literature suggests enough evidence in support of this in various settings including Jamaica, Bolivia and Kenya. (25,26,27) Certain mechanisms like their enhanced ability for home care of child, to recognize illness and seek treatment for their children, to understand medical instructions and apply treatment and more reception to medical care have been some of the

proposed links. (28) Other studies have found a strong link between maternal education, social economic status and child nutrition. Educated women are likely to get better jobs; marry men with higher education and income; live in better neighbourhoods which influence child health. (25,29,30) A study in India demonstrated a clear gradient in the association between wealth quintiles and maternal education and the probability of being undernourished, with greater wealth and higher education associated with lower probabilities of under-nutrition. (20) These disparities either widened or stayed the same during the time of economic growth i.e. 1992-2005. (20)

Conclusion & Recommendation

There is high and persistent problem of under-nutrition in Haryana which is more concentrated among the poor, uneducated, slum dwellers, and among children of women who do not take ANC care/ breastfeed. Action on social determinants is urgently warranted.

Limitation of the study

Since selection of districts for the study was dependent upon design of the pilot project for nutritional intervention programme of NRHM, Haryana, the study could be conducted in only four northern districts of the state which may not be representative of the whole state. Since the selected districts are among the well performing districts of the state, the prevalence of under-nutrition in Haryana is likely to be higher than what is reported in our study.

Relevance of the study

This paper gives the burden of under-nutrition among under five children at the district level which is crucial for program planning and implementation. It also examines the role of social determinants which play an important role in determining the nutritional status of children in Haryana.

Authors Contribution

SP and SKD were involved in conceptualization and design of the study, critically revised the manuscript and gave final approval of the version to be published. AS and SKR were involved in collection of data, analysis and interpretation of data. JPT was involved in analysis and interpretation of data, drafting of the manuscript. AKA and SP critically revised the manuscript for important intellectual

content and gave final approval of the version to be published.

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Tables

TABLE 1 CHARACTERISTICS OF UNDER-FIVE YEAR OLD CHILDREN SURVEYED IN FOUR DISTRICTS

		Ambala N (%)	Karnal N (%)	Panchkula N (%)	Yamunanagar N (%)	Total N (%)
Gender	Male	380 (59.4)	364 (56.9)	363 (56.7)	483 (57.3)	1590 (57.5)
	Female	260 (40.6)	276 (43.1)	277 (43.3)	360 (42.7)	1173 (42.5)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Residence	Rural	440 (68.8)	440 (68.8)	440 (68.8)	440 (52.2)	1760 (63.7)
	Urban	100 (15.6)	100 (15.6)	100 (15.6)	198 (23.5)	498 (18)
	Slum	100 (15.6)	100 (15.6)	100 (15.6)	205 (24.3)	505 (18.3)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Age of the child	0-6 month	54 (8.4)	64 (9.8)	64 (10)	81 (10.5)	263 (9.5)
	6 months -1 year	76 (11.8)	96 (14.6)	74 (11.6)	124 (14.7)	370 (13.4)
	1-3 years	287 (45)	313 (49.5)	313 (48.9)	400 (47.6)	1313 (47.5)
	3-6 years	223 (34.9)	167 (26)	189 (29.5)	230 (27.2)	809 (29.3)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Social Group	SC/ST	269 (41.9)	211 (33)	215 (33.6)	359 (42.6)	1054 (38.1)
	OBC	237 (37.1)	199 (31.1)	152 (23.8)	273 (32.4)	861 (31.2)
	Others	134 (21)	230 (36)	273 (42.7)	211 (25)	848 (30.7)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Occupation of father	Labour wages	85 (13.3)	111 (17.1)	3 (0.3)	11 (1)	210 (7.6)
	Self Employed	473 (74)	478 (75.3)	404 (63.3)	721 (86.1)	2076 (75.1)
	Regular salaries	82 (12.7)	51 (7.6)	233 (36.4)	111 (12.9)	477 (17.3)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Education of father	Illiterate	117 (18.3)	168 (26.4)	151 (23.6)	111 (13.2)	547 (19.8)
	Up to primary school	143 (22.4)	143 (22.3)	85 (13.3)	198 (23.5)	569 (20.6)
	Up to secondary school	251 (39.2)	200 (31.3)	189 (29.5)	331 (39.3)	971 (35.1)
	Higher secondary and above	129 (20.1)	129 (20.1)	215 (33.6)	203 (24.1)	676 (24.5)
	Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)
Wealth Quintile	Poorest	104 (16.3)	174 (27.2)	170 (26.6)	105 (12.5)	553 (20)
	Poor	99 (15.5)	170 (26.6)	103 (16.1)	181 (21.5)	553 (20)
	Medium	165 (25.8)	94 (14.7)	93 (14.5)	200 (23.7)	552 (20)
	Rich	134 (20.9)	86 (13.4)	158 (24.7)	174 (20.6)	552 (20)
	Richest	138 (21.6)	116 (18.1)	116 (18.1)	183 (21.7)	553 (20)
Total	640 (100)	640 (100)	640 (100)	843 (100)	2763 (100)	

TABLE 2 PREVALENCE OF UNDERWEIGHT, WASTING AND STUNTING AMONG UNDER-FIVE YEAR OLD CHILDREN IN HARYANA STATE

Characteristics	Underweight		Wasting		Stunting	
	Overall n (%)	Severe n (%)	Overall n (%)	Severe n (%)	Overall n (%)	Severe n (%)
Overall	987(37.4)	335(12.7)	423(16.4)	90(3.5)	908(38.2)	313(13.2)
Districts						
Ambala	238(39.1)	87(14.3)	102(17.2)	29(4.9)	212(39.3)	92(17.1)
Karnal	238(40.3)	95(16.1)	124(21.9)	24(4.2)	189(36.3)	65(12.5)
Panchkula	211(35.3)	71(11.9)	83(14.0)	12(6.0)	209(37.6)	73(13.2)
Yamunanagar	300(35.6)	82(9.7)	114(13.9)	25(3.0)	298(39.1)	83(10.9)
Age						
0-6 months	61(23.6)	22(8.5)	36(14.6)	6(2.4)	34(14.5)	13(5.5)
6-12 months	86(24.6)	28(8.0)	58(17.1)	13(3.8)	80(24.2)	20(6.1)
1-3 years	485(38.6)	170(13.5)	212(17.3)	47(3.8)	476(42.5)	155(13.9)
3-5 years	355(45.9)	115(14.9)	116(15.3)	23(3.0)	318(46.1)	125(18.1)

P value	<0.01	<0.01	0.57	0.61	<0.01	<0.01
Gender						
Male	574(37.8)	196(12.9)	263(17.8)	62(4.2)	517(38.1)	181(13.3)
Female	412(36.8)	139(12.4)	159(14.6)	28(2.6)	390(38.2)	132(12.9)
p value	0.58	0.70	<0.05	<0.05	0.96	0.77
Place of residence						
Rural	623(37.4)	220(13.2)	309(19.1)	67(4.1)	569(37.3)	193(12.7)
Urban	143(29.9)	36(7.5)	49(10.4)	10(21.)	130(30.1)	45(10.4)
Slum	221(44.6)	79(16.0)	65(13.4)	13(2.4)	209(49.5)	75(17.8)
p value	<0.01	<0.01	<0.01	0.06	<0.01	<0.01
Social group						
SC/ST	465(46.3)	176(17.5)	201(20.6)	44(4.5)	392(44.2)	150(16.9)
OBC	323(39.1)	100(12.1)	129(15.9)	24(2.9)	300(28.8)	107(14.3)
General and other	193(24.0)	55(6.8)	89(11.4)	19(2.4)	312(38.1)	56(7.6)
p value	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Education of parent						
Illiterate	274(53.6)	113(22.1)	104(20.8)	27(5.4)	223(51.6)	103(23.8)
Primary and below Primary	258(47.0)	97(17.7)	111(20.8)	21(3.9)	220(45.3)	71(14.6)
Middle and Matric	328(35.2)	91(9.8)	137(15.1)	27(3.0)	310(36.3)	93(10.9)
Higher secondary and above	123(19.1)	31(4.9)	68(11.0)	13(2.1)	152(25.9)	46(7.8)
p value	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
Occupation of parent						
Labour wages	89(46.8)	38(20.0)	55(30.4)	12(6.63)	66(40.0)	28(17.0)
Self Employed	781(39.3)	269(13.5)	313(16.2)	68(3.5)	719(40.6)	253(14.3)
Regular salaries	108(24.3)	22(4.9)	50(11.3)	8(1.8)	116(27.3)	31(7.3)
p value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Wealth quintile						
Poorest	278(53.2)	116(22.2)	108(21.0)	24(4.7)	225(50.4)	95(21.3)
Poor	246(46.9)	97(18.5)	102(20.2)	18(3.6)	211(46.1)	71(15.5)
Middle	219(41.1)	60(11.3)	33(17.9)	19(3.6)	206(42.3)	85(17.5)
Rich	142(27.0)	44(8.4)	67(13.0)	21(4.1)	139(28.5)	32(6.6)
Richest	102(19.1)	18(3.4)	53(10.2)	8(1.5)	127(25.3)	30(5.9)
p value	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Source of drinking water						
Pipe/Tube well	797(37.4)	267(12.5)	352(16.9)	71(3.4)	738(38.0)	254(13.3)
Others	47(33.3)	18(12.7)	15(10.9)	5(3.6)	41(33.9)	15(12.4)
p value	0.33	0.94	0.06	0.89	0.37	0.83
Sanitation						
Flush/pit latrine	652(33.1)	189(9.6)	284(14.7)	55(2.8)	640(35.3)	203(11.2)
Open defecation	277(50.5)	126(23.0)	45(16.8)	4(4.5)	33(40.7)	14(17.3)
Other facility	39(43.3)	11(12.2)	114(21.6)	26(5.3)	223(48.9)	92(20.2)
p value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Consumption of IFA during pregnancy						
<30 tablets	282(37.3)	84(11.1)	101(13.7)	22(3.0)	287(42.5)	83(12.3)
30-89 tablets	40(30.1)	18(13.5)	27(21.3)	9(7.1)	28(22.8)	6(4.9)
≥90 tablets	76(23.8)	23(7.2)	46(14.9)	8(2.6)	51(17.1)	15(5.0)
p value	<0.01	0.07	0.08	<0.05	<0.01	<0.01

TABLE 3 RISK FACTORS FOR UNDERWEIGHT, WASTING AND STUNTING AMONG CHILDREN UNDER-FIVE YEARS OF AGE

	Underweight		Wasting		Stunting	
	Overall OR (95% CI Lower, Upper)	Severe OR (95% CI Lower, Upper)	Overall OR (95% CI Lower, Upper)	Severe OR (95% CI Lower, Upper)	Overall OR (95% CI Lower, Upper)	Severe OR (95% CI Lower, Upper)
Residence						
Rural(RF)	-	-	-	-	-	-
Urban	0.94(0.74,1.21)	0.78(0.53,1.16)	0.64**(0.45,0.89)	0.61(0.29,1.28)	0.85(0.66,1.10)	1.03(0.71,1.50)
Slum	1.01(0.80,1.26)	0.96(0.70,1.31)	0.59**(0.43,0.80)	0.59(0.31,1.13)	1.37**(1.10,1.75)	1.18(0.85,1.63)
Gender of the child						
Male(RF)			-	-		
Female			0.81(0.55,1.02)	0.67(0.42,1.07)		
Age of the child						
0-6 months(RF)	-	-	-	-	-	-
6-12 months	1.12(0.76,1.67)	0.98(0.54,1.81)	1.29(0.80,2.10)	1.64(0.61,4.42)	1.91**(1.21,3.00)	1.08(0.52,2.24)
1-3 years	2.16**(1.56,3.00)	1.73*(1.06,2.83)	1.22(0.82,1.82)	1.52(0.64,3.64)	4.71**(3.18,6.78)	2.79**(1.54,5.10)
3-5 years	2.76**(1.97,3.88)	1.77*(1.07,2.93)	1.03(0.67,1.57)	1.11(0.44,2.82)	5.06**(3.38,7.59)	3.47**(1.90,6.34)
Social Group						
SC/ST	1.61**(1.26,2.05)	1.40(0.96,2.02)	1.55**(1.13,2.12)	1.23(0.66,2.31)	1.24(0.96,1.58)	1.51*(1.04,2.20)
OBC	1.39**(1.10,1.77)	1.09(0.75,1.60)	1.21(0.88,1.66)	0.85(0.44,1.63)	1.24(0.97,1.58)	1.39(0.96,2.03)
Other General(RF)	-	-	-	-	-	-
Education of the mother						
Illiterate (RF)	-	-	-	-	-	-
Primary and below	0.87(0.67,1.13)	0.91(0.66,1.27)	0.99(0.72,1.37)	0.65(0.35,1.21)	0.92(0.69,1.22)	0.63**(0.44,0.90)
Primary						
Middle and Matric	0.69**(0.54,0.89)	0.64**(0.45,0.90)	0.80(0.58,1.10)	0.50*(0.27,0.95)	0.74*(0.56,0.97)	0.58**(0.41,0.83)
Higher Secondary and Above	0.45**(0.33,0.63)	0.51**(0.31,0.85)	0.72(0.48,1.09)	0.46(0.20,1.10)	0.62(0.45,0.87)	0.69(0.43,1.10)
Occupation of the father						
Wage Labourer (RF)	-	-	-	-	-	-
Self Employed	1.08(0.78,1.51)	1.06(0.69,1.62)	0.66*(0.46,0.97)	0.69(0.34,1.39)	1.39(0.97,2.00)	1.10(0.69,1.77)
Regular Salaried	0.82(0.55,1.23)	0.57(0.31,1.06)	0.55*(0.34,0.90)	0.43(0.16,1.19)	1.00(0.65,1.53)	0.73(0.40,1.34)
Sanitation						
Flush/Pit latrine (RF)-						
Open defecation	0.83(0.53,1.31)	0.74(0.38,1.44)	0.75(0.41,1.35)	1.18(0.40,3.47)	0.80(0.49,1.30)	0.95(0.51,1.78)
Other facility	1.08(0.86,1.36)	1.48**(1.11,1.98)	0.99(0.75,1.30)	1.42(0.83,2.44)	1.17(0.92,1.50)	1.23(0.90,1.69)
Wealth Quintile						
Poorest	2.33**(1.65,3.30)	3.26**(1.78,5.97)	1.46(0.93,2.29)	1.28(0.46,3.55)	1.84**(1.30,2.61)	2.42**(1.42,4.13)
Poor	1.93**(1.39,2.67)	3.13**(1.74,5.64)	1.54*(1.00,2.37)	1.28(0.48, 3.42)	1.61**(1.16,2.24)	1.83**(1.10,3.10)
Medium	1.72**(1.25,2.35)	1.99*(1.10,3.60)	1.32(0.87,2.00)	1.38(0.54,3.57)	1.48**(1.10,2.02)	2.33**(1.42,3.83)
Rich	1.21(0.89,1.65)	2.02*(1.13,3.63)	1.13(0.76,1.69)	2.33*(0.99,5.50)	0.98(0.72,1.32)	0.96**(0.56,1.63)
Richest(RF)	-	-	-	-	-	-

OR=Odd ratio, CI=Confidence interval, RF= Reference categories, **p<0.01, *p<0.05