CHAPTER

III

RESULTS

The result were analysed as follows

a) Socioeconomic, demographic and household data

b) The whole data Case and Control data (cross-sectional study)

c) Puerly Longitudinal Data

d) Mother and Child Nutritinal status Data

SOCIOECONOMIC DEMOGRAPHIC AND HOUSEHOLD CHARACTERISTIC OF THE CHILDREN

The present longitudinal study was undertaken on Case Phase I (315), Phase II (308), Phase III (297), and Phase IV (284) and Control Phase I (319), Phase II (240), Phase III (230) and Phase IV (201) children (boys and girls) aged 12 to 60 months respectively of their mothers from 22 Integrated child development scheme (ICDS) of Matigara, Darjeeling district, West Bengal. Data was collected from all ICDS centers in four rounds at three monthly intervals (30 days) from August 2013 to April 2014. Data collection in each round included anthropometry (weight, height, mid upper arm circumference, triceps, and sub-scapular skin fold measurements).

Distribution of children according to number of rounds for which they were measured is shown in **Table 3.3**. The data was analyzed both cross-section ally and longitudinally. Multiple observations were available for each child during the study, each independent observation was analyzed longitudinally (in both Case and Control Group). Of the 1294 children enrolled, data on 634 children were obtained for all 4 rounds. 315 Case children and 319 Control Group of children Data collected from these children was considered for longitudinal analysis (**Table 3.2)**. Data could be manageable in two ways. One way the whole data should analyzed those are presented in whole Case and Control data. And another type is the data those are

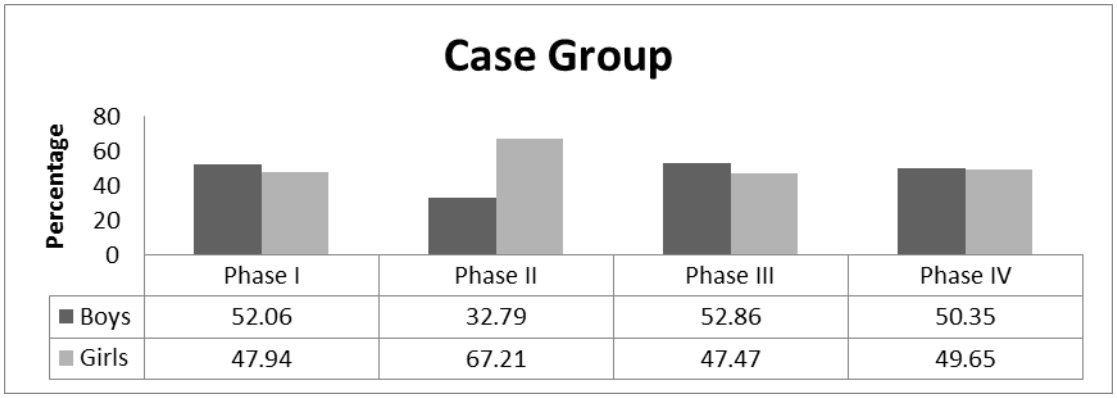
absent and present in any Cases. Like an example if one data is presented in Phase I, II, III but absent in Phase IV those data should be included as one population sample size. This is the idea of data managing. (Dasgupta 2008). Socio-economic and demographic data was collected from the primary caregiver (mother/ grandmother/ father) at the time of enrollment of the children in the study (Case=315 and Control 319) and was updated during each visit. The data included gender, age, birth order, and number of living room, mother's age at child birth, birth interval of children, mother's occupation, father's occupation, house pattern, media exposure, number of sibling, family size, electricity facilities, mother's occupation, father's occupation, income depicted in **Table 3.1.**

Table 3.1: Socioeconomic and Demographic variables of the children : (perentheses indicate percentage)

Variable		CASE				CONTROL			
		Phase I	Phase II	Phase III	Phase IV	Phase I	Phase II	Phase III	Phase IV
		(315)	(308)	(297)	(284)	(319)	(240)	(230)	(201)
Gender	**Boys**	164 (52.06)	101 (32.79)	157 (52.86)	143 (50.35)	164 (51.41)	123 (51.25)	118 (51.34)	97 (48.26)
	Girls	151 (47.94)	207 (67.21)	141 (47.47)	141 (49.65)	155 (48.59)	117 (48.75)	112 (48.69)	104 (51.74)
Age	**12-23 Months**	44 (13.97)	58 (18.83)	36 (12.12)	38 (13.28)	55 (17.24)	26 (10.83)	25 (10.87)	26 (12.93)
	24-35 Months	85 (26.98)	73 (23.70)	67 (22.56)	49 (17.25)	81 (25.39)	48 (20.00)	49 (21.30)	42 (20.89)
	36-47 Months	68 (21.58)	57 (18.51)	64 (21.55)	59 (20.77)	68 (21.31)	63 (26.25)	63 (27.39)	53 (26.37)
	48-59 Months	54 (17.14)	64 (20.78)	66 (22.22)	64 (22.54)	50 (15.67)	56 (23.33)	50 (21.74)	48 (23.88)
	60 Months	65 (20.63)	56 (18.18)	64 (21.55)	74 (26.06)	65 (20.38)	47 (19.58)	43 (18.69)	32 (15.92)
Birth order	**1**	135 (42.86)	128 (41.56)	123(41.41)	115 (40.49)	150 (47.02)	111 (46.25)	101(43.91)	72(35.82)
	2	117 (37.14)	117 (37.99)	112 (37.71)	107 (37.68)	107 (33.54)	73 (30.42)	73(31.74)	73 (36.32)
	3≥	63 (20.00)	63 (20.45)	62 (20.88)	62 (21.83)	62 (19.44)	56 (23.33)	56(24.35)	56 (27.86)
Water facilities	**Yes (piped)**	154 (48.89)	150 (48.70)	145 (48.82)	132 (46.48)	167 (52.35)	139 (57.92)	129 (56.09)	100 (49.75)
	No (others)	161 (51.11)	158 (51.30)	152 (51.18)	152 (53.52)	152 (47.65)	101 (42.08)	101 (43.91)	101(50.25)
Mother age at child birth	**≤ 18 years**	198 (62.86)	190 (61.69)	190 (63.97)	180 (63.38)	215 (67.40)	137(57.08)	127 (55.22)	98 (48.76)
	≥19 years	117 (37.14)	118 (38.31)	107 (36.03)	104(36.62)	104 (32.60)	103 (42.92)	103 (44.78)	103 (51.24)
Birth interval	**< 24 months**	165 (52.38)	155 (50.32)	150 (50.51)	142 (50.00)	177 (55.49)	140 (58.33)	130 (56.52)	101 (50.25)
	≥ 24 months	150 (47.62)	153 (49.68)	147 (49.49)	142 (50.00)	142 (44.51)	100 (41.67)	100 (43.48)	100 (49.75)
Mother's education	**Illiterate**	190 (60.32)	198 (64.29)	193 (64.98)	180(63.38)	215 (67.40)	148 (61.67)	138 (60.00)	109 (54.23)
	Primary ≥	125 (39.68)	110 (35.71)	104 (35.02)	104.(36.62)	104 (32.60)	92 (38.33)	92 (40.00)	92(45.77)
Father's education	**Illiterate**	121 (38.41)	121 (39.29)	110 (37.04)	97 (34.15)	132 (41.38)	147 (61.25)	137(59.57)	108 (53.73)
	Primary ≥	194 (61.59)	187 (60.71)	187 (62.96)	187 (65.85)	187 (58.62)	93 (38.75)	93 (40.43)	93 (46.27)
House Pattern	**Kaccha**	176 (55.87)	172 (55.84)	172 (57.91)	159 (55.99)	194 (60.82)	141 (58.75)	131 (56.96)	102 (50.75)
	Pucca	139 (44.13)	136 (44.16)	125 (42.09)	125 (44.01)	125 (39.18)	99 (41.25)	99 (43.04)	99 (49.25)
Media exposure	**Regularly**	149 (47.30)	141 (45.78)	130 (43.77)	117 (41.20)	152 (47.65)	130 (54.17)	120 (52.17)	91 (45.27)
	Not regularly	166 (52.70)	167 (54.22)	167 (56.23)	167 (58.80)	167 (52.35)	110 (45.83)	110 (47.83)	110 (54.73)
Siblings	**1-2**	198 (62.86)	190 (61.69)	179 (60.27)	166 (58.45)	201 (63.01)	141 (58.75)	131 (56.96)	102 (50.75)
	3 ≥	117(37.14)	116 (37.66)	118(39.73)	118 (41.55)	118 (36.99)	99 (41.25)	99 (43.04)	99 (49.25)
Family Size	**≥ 4**	140 (44.44)	136 (44.16)	125 (42.09)	112 (39.44)	157 (49.22)	148 (61.67)	138 (60.00)	109 (54.23)
	5 ≥	175 (55.56)	172 (55.84)	172 (57.91)	172 (60.56)	162 (50.78)	92 (38.33)	92 (40.00)	92 (45.77)
Toilet Facilities	**No**	165 (52.38)	161 (52.27)	150 (50.51)	137 (48.24)	172 (53.92)	147 (61.25)	137 (59.57)	108 (53.73)
	Yes	150 (47.62)	147 (47.73)	147 (49.49)	147 (51.76)	147 (46.08)	93(38.75)	93 (40.43)	93 (46.27)
Electricity	**No**	187 (59.37)	183 (59.42)	172 (57.91)	159 (55.99)	159 (49.84)	101 (42.08)	101 (43.91)	101 (50.25)
	Yes	128 (40.63)	125 (40.58)	125 (42.09)	125 (44.01)	160 (50.16)	139 (57.92)	129 (56.09)	100 (49.75)
Mother's Occupation	**Housewife**	215 (68.25)	210 (68.18)	199 (67.00)	186 (65.49)	196 (61.44)	187 (77.92)	53(23.04)	133 (66.17)
	Manual worker	100 (31.75)	98 (31.82)	98 (33.00)	98 (34.51)	133 (38.56)	53 (22.08)	177(76.96)	68 (33.83)
Father's Occupation	**Manual worker**	172 (54.60)	168 (54.55)	157 (52.86)	144 (50.70)	144 (45.14)	144 (60.00)	73(31.74)	73 (36.32)
	Others	143 (45.40)	140 (45.45)	140 (47.14)	140 (49.30)	175 (54.86)	96 (40.00)	157 (68.26)	128 (63.68)
Income	**≤ Rs. 2000**	70 (22.22)	170 (55.19)	159 (53.54)	146 (51.41)	181 (56.74)	107 (44.58)	97(42.17)	68 (33.83)
	Rs.2001-4000	71 (22.54)	71 (23.05)	71 (23.91)	71(25.00)	87 (27.27)	83 (34.58)	83 (36.09)	83 (41.29)
	≥ Rs. 4001	174 (55.24)	67 (21.75)	67 (22.56)	67 (23.59)	51 (15.99)	50(20.83)	50 (21.74)	50 (24.88)

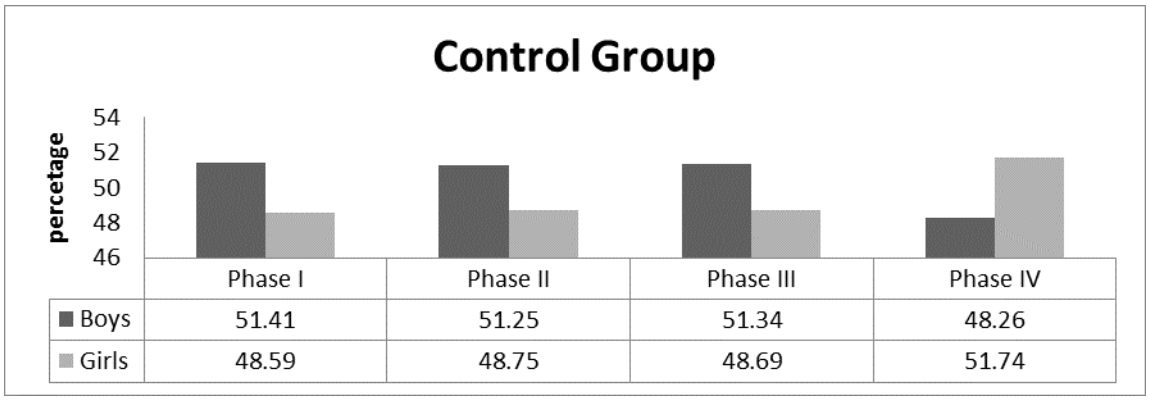
Gender

The present study should highest number of boys 52.86 % present in Phase III of Case Group and 51.41 % in Phase II of Control Group. Girls were observed to be highest 67.21 % in Phase II and 51.74 % in Phase IV. The Control Group 51.41 % boys were present in Phase II and 51.74 % girls were present in Phase IV. The lowest number of boys was in Case Phase II and in Control Phase IV 32.79% and 48.56%. Among girls 47.47% in Case Phase III and 48.59% in Control Group Phase III. These are graphically represented in **Figure 3.1 and 3.2**



(Figures in x-axis indicates percentage)

Figure 3.1 Bar diagram showing the total percentage of the boys and girls in Case Group:

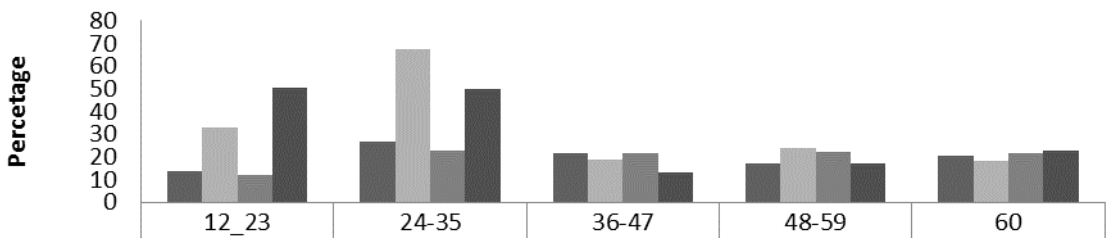


(Figures in x-axis indicates percentage)

Figure 3.2 Bar diagram showing the total percentage of the boys and girls in Control Group

Age

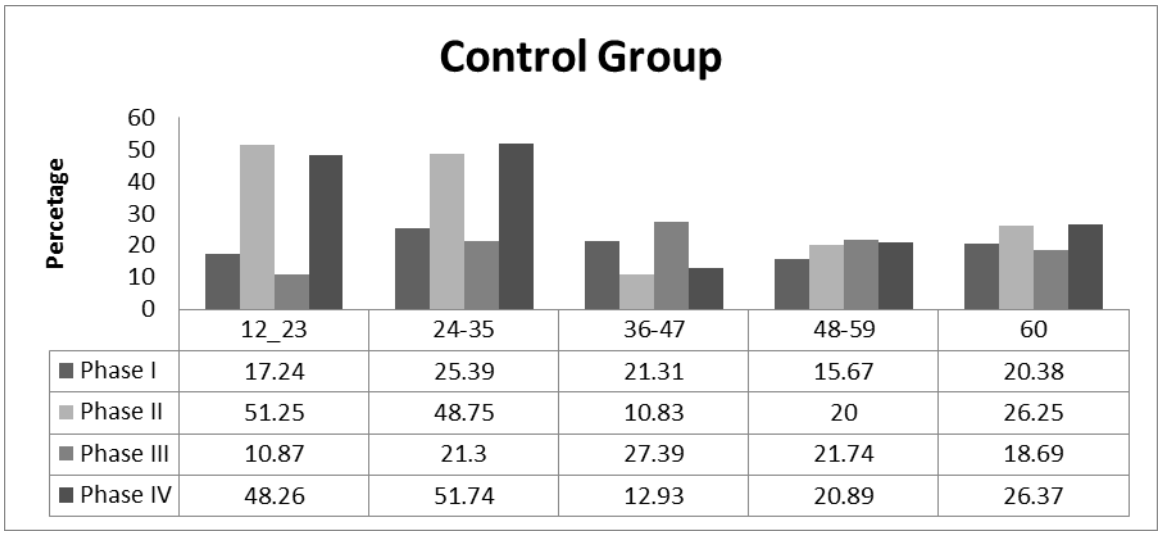
The age Group of 12-23 months had the highest number of children in Case Phase II (18.83%) and the lowest in Phase II (10.83%). The age Group of 24-35 months had the highest number of Case children in Phase I (26.98%) and the lowest in Phase IV (17.25%). The age Group of 36-47 months had the highest number of Control children in Phase III (27.39%) and the lowest in Case Phase II (18.51%). The age Group of 48-59 months had the highest number of Control children in Phase IV (23.88%) and the lowest in Control Phase II (15.67%). The last age of 60 months had the highest number of children in Case Phase IV (26.06%) and the lowest number in Control Phase IV respectively. These are graphically represented in **Figure 3.3 and 3.4.**



	12_23	24-35	36-47	48-59	60
Phase I	13.97	26.98	21.58	17.14	20.63
Phase II	32.79	67.21	18.83	23.7	18.18
Phase III	12.12	22.56	21.55	22.22	21.55
Phase IV	50.35	49.65	13.28	17.25	22.54

(Figures in x-axis indicates percentage, x-axis of age group in months eg. 12-23 months etc)

Figure 3.3 Bar diagram showing the total percentage of the age distribution among boys in Case Group



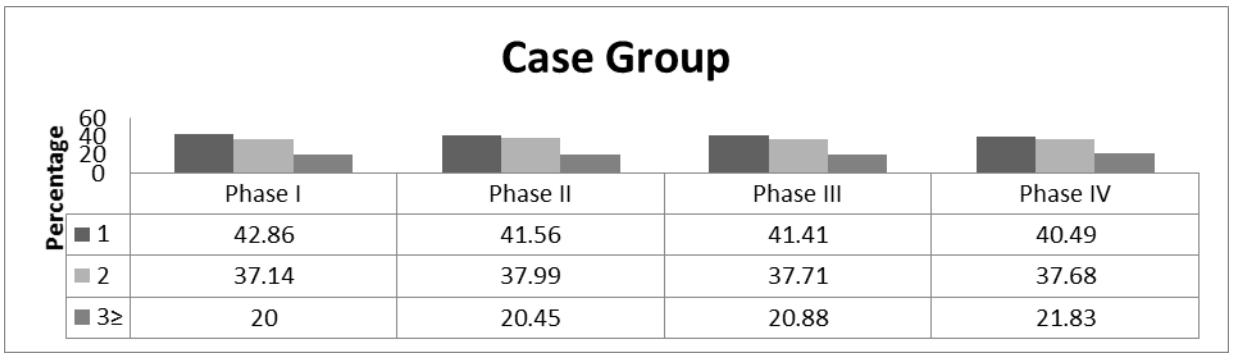
	12_23	24-35	36-47	48-59	60
Phase I	17.24	25.39	21.31	15.67	20.38
Phase II	51.25	48.75	10.83	20	26.25
Phase III	10.87	21.3	27.39	21.74	18.69
Phase IV	48.26	51.74	12.93	20.89	26.37

(Figures in x-axis indicates percentage, x-axis of age group in months eg. 12-23 months etc)

Figure 3.4 Bar diagram showing the total percentage of the age distribution among girls in Control Group

Birth order

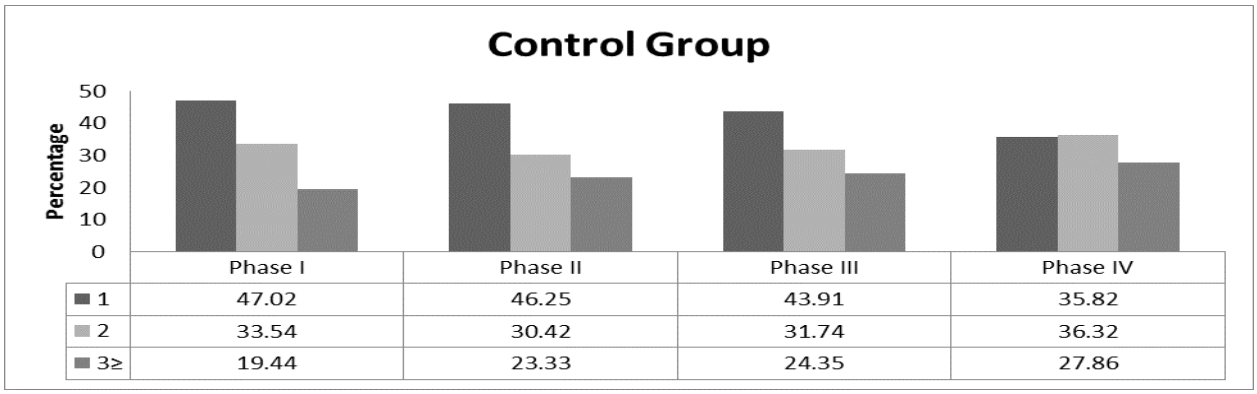
The overall birth order showed that highest percentage of the individual belongs to 1st order birth in Phase I of Case and Control Group 42.86 % and 47.00 % respectively. Birth order two and three were found in Phase II (48.89 %), Phase IV (36.32 %) and Phase IV (21.83 % and 27.86 %) of Case and Control Group of study population. These are graphically represented in **Figure 3.1.5 and 3.1.6.**



	Phase I	Phase II	Phase III	Phase IV
1	42.86	41.56	41.41	40.49
2	37.14	37.99	37.71	37.68
3≥	20	20.45	20.88	21.83

(Figures in x-axis indicates percentage)

Figure 3.5 Bar diagram showing the total percentage of birth order in Case Group children

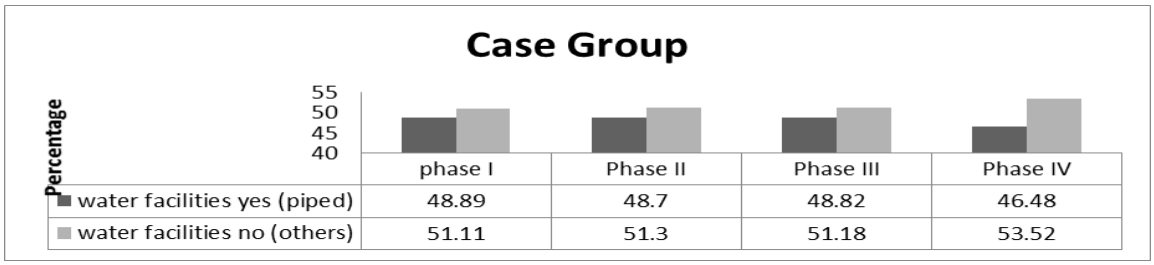


(Figures in x-axis indicates percentage)

Figure 3.6 Bar diagram showing the total percentage of birth order in Control Group

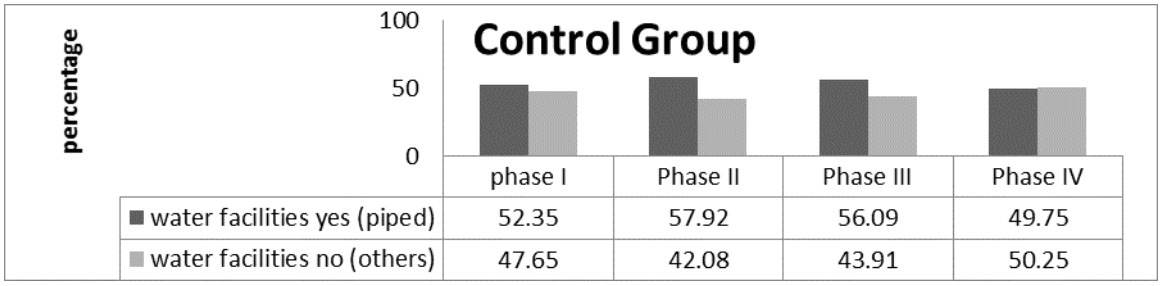
Water facilities

The highest percentage was found in using other source of water in Phase I (51.11 and 47.65), Phase II (51.30 and 42.08), Phase III (51.18 and 43.91) and Phase IV (53.52 and 50.25) of Case and Control Group respectively. The other source of water used was found higher than Case Group in Phase I (48.49 and 52.35), Phase II (48.82 and 57.92), Phase III (48.82 and 56.09), and Phase IV (46.48 and 49.75) of Case and Control Group. These are graphically represented in **Figure 3.7 and 3.8.**



(Figures in x-axis indicates percentage)

Figure 3.7 Bar diagram showing the total percentage of water facilities in Case Group

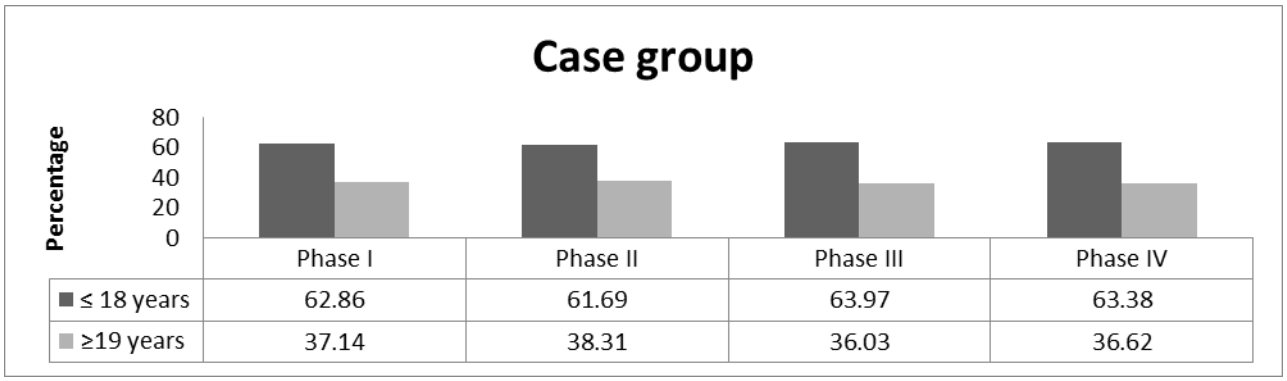


(Figures in x-axis indicates percentage)

Figure 3.8 Bar diagram showing the total percentage of water facilities in Control Group

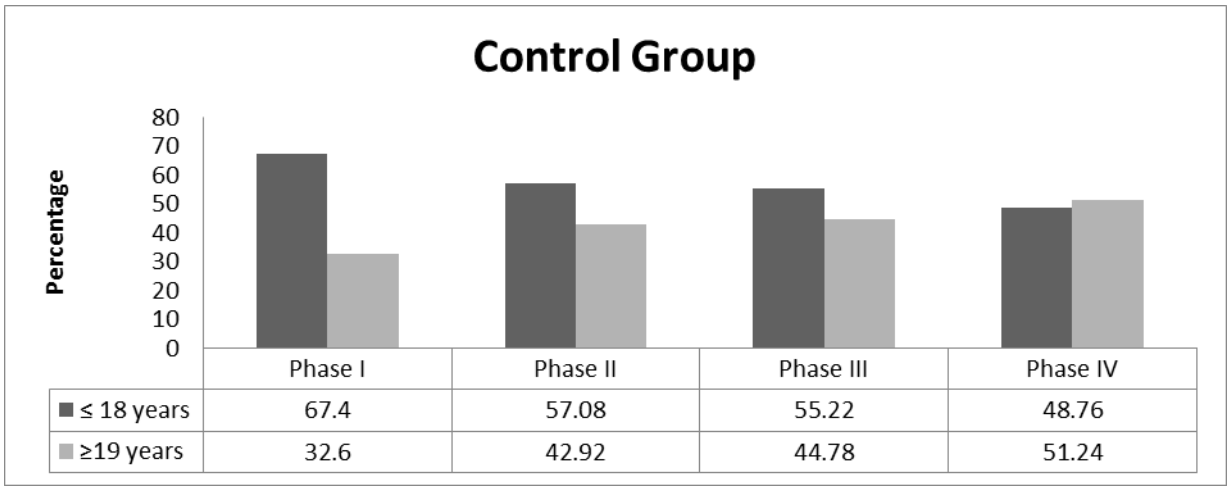
Mother's age at child birth

The average age of mother at first child birth below 18 years age was highest in Phase I (62.86% and 67.40%), Phase II (61.69% and 57.08%), Phase III (63.97% and 55.22%) and Phase IV (63.38% and 48.76%) of Case and Control Group respectively. Those mother's whose age were belongs to above 19 years were found lower then Case Group in Phase I (37.14% and 32.60%), Phase II (38.31% and 42.92%), Phase III (36.03% and 44.78%), and Phase IV (36.62% and 51.24%) of Case and Control Group of study population. These are graphically represented in **Figure 3.9 and 3.10.**



(Figures in x-axis indicates percentage)

Figure 3.9 Bar diagram showing the total percentage of early and late marriage among mother's status in Case Group

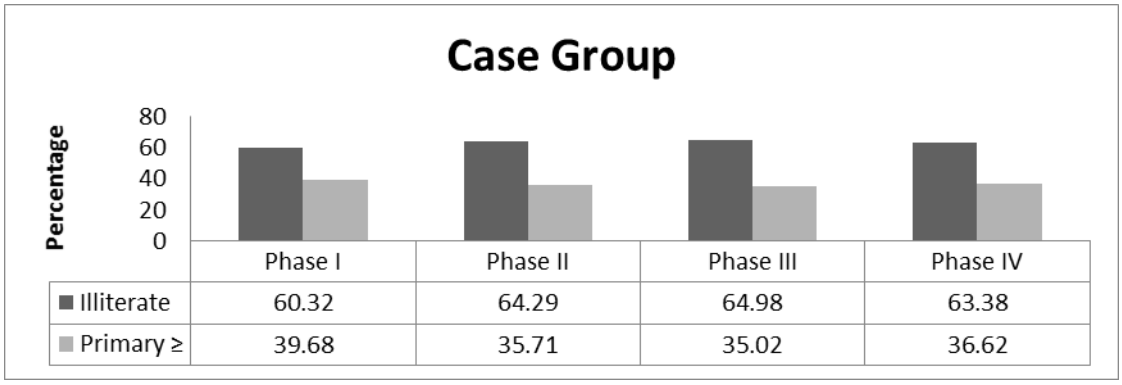


(Figures in x-axis indicates percentage)

Figure 3.10 Bar diagram showing the total percentage of early and late marriage among mother's status in Control Group

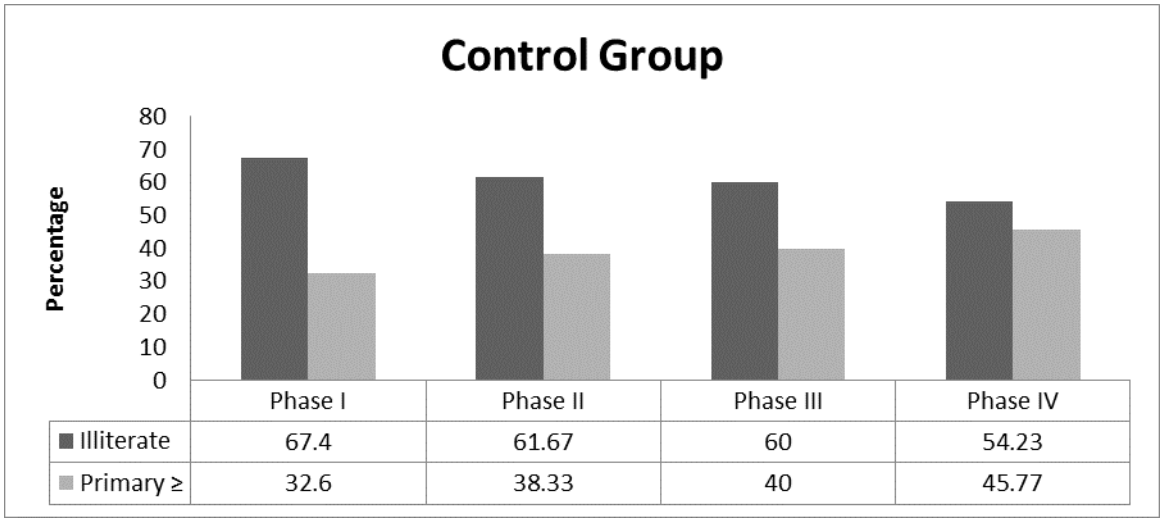
Educational status of parents

Half of the fathers were educated up to secondary level or more; one fifth had primary level education and one fourth were illiterate. In comparison half of the mothers were illiterate; in Phase III of Case Group 39.68 % and in Phase IV of Control Group 45.77 % had primary level education. These are graphically represented in **Figure 3.11 and 3.12.**



(Figures in x-axis indicates percentage)

Figure 3.11 Bar diagram showing the education status of mother's in Case Group

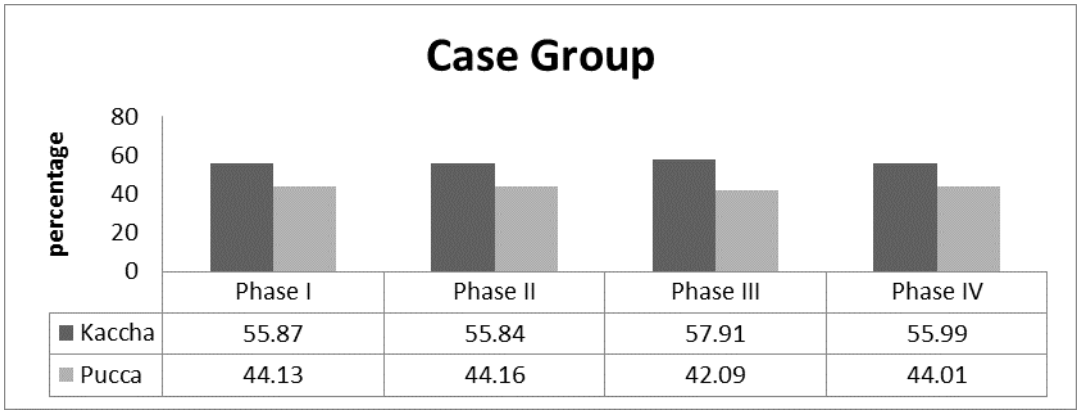


(Figures in x-axis indicates percentage)

Figure 3.12 Bar diagram showing the education status of father's in Control Group

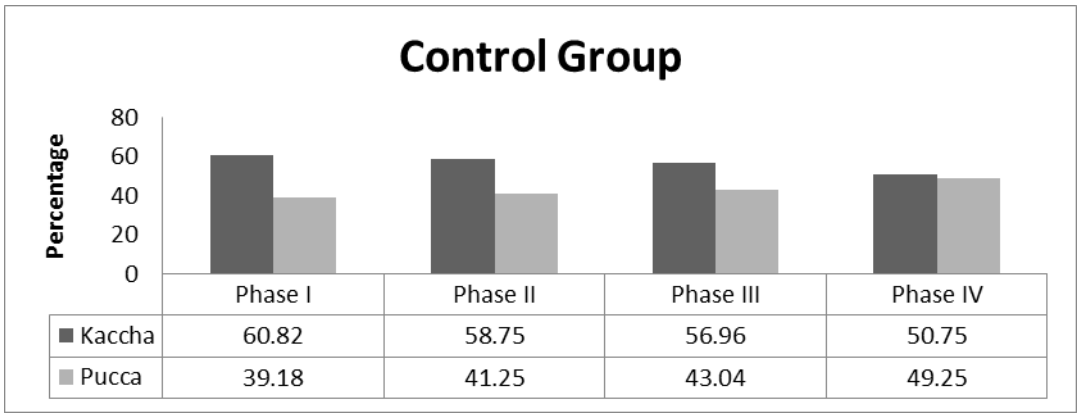
House Pattern

The majority of individual had kuccha type of house (60.82 %) in Phase I of Control Group of study. And pucca house pattern were found highest in Case and Control Group was 44.16 % in Phase II and 49. 25 % in Phase IV respectively. It needs to be mentioned that in Case Group both house pattern in Phase I was 55.87 % and 44.13 %, in Phase II 44.16% and 55.84 % and 44.16 %), Phase III (57.91 % and 42.09%, and Phase IV 55.99 %. In Control Group it is in Phase I 62.82% and 39.18%, Phase II 58.75 % and 41.25%, Phase III 56.96% and 43.04%. In Phase IV 50.75% respectively. These are graphically represented in **Figure 3.13 and 3.14.**



(Figures in x-axis indicates percentage)

Figure 3.13 Bar diagram showing the house pattern in Case Group

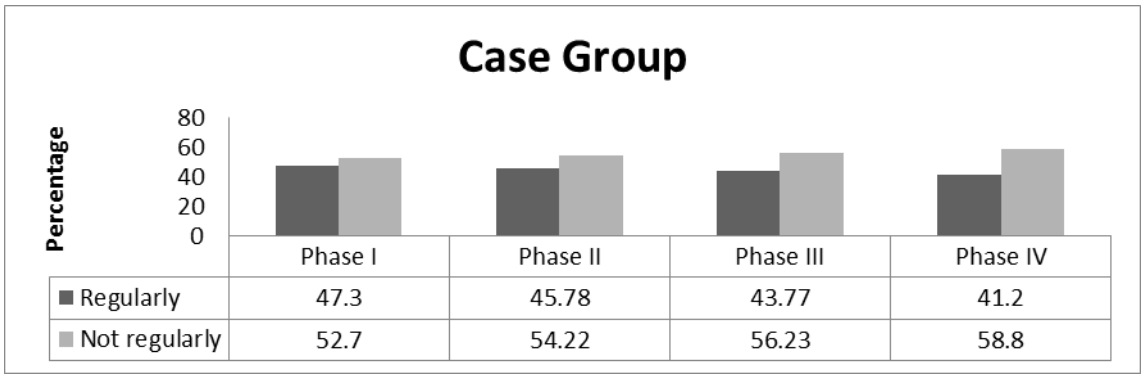


(Figures in x-axis indicates percentage)

Figure 3.14: Bar diagram showing the house pattern in Control Group

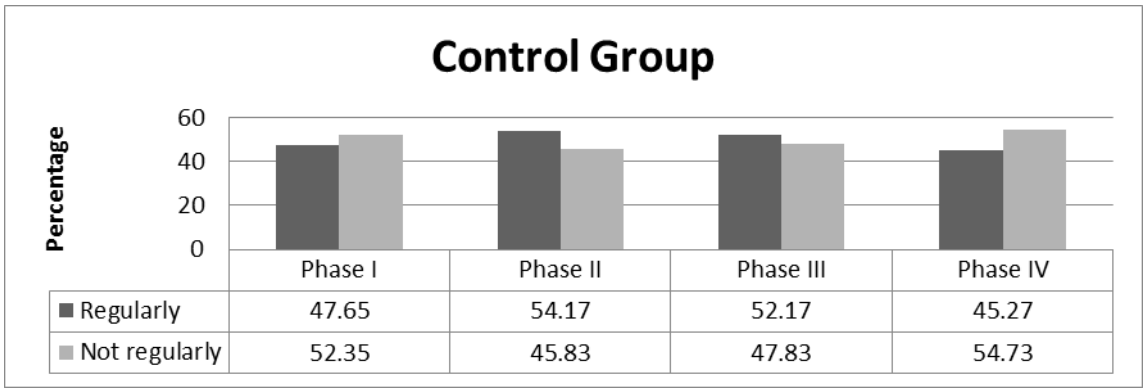
Media exposure

In today's society every individual is overwhelmed by different types of media. The present study showed that the regularly watching media (television, radio, newspapers etc.) in Case Group and Control Group were Phase I (47.30 % and 47.65%), Phase II (45.78% and 54.17%), Phase III (43.77 % and 52.17 %) and Phase IV (41.20% and 45.27%).The "not regularly" were found in Case and Control Phase wise were (52.70 %, 54.22 %, 56.23% and 58.80%) and (52.35 %, 45.83%, 47.83% and 54.73 %) in Phase I, II, III and IV respectively. These are graphically represented in **Figure 3.15 and 3.16.**



(Figures in x-axis indicates percentage)

Figure 3.15 Bar diagram showing the media exposure of individuals in Case Group

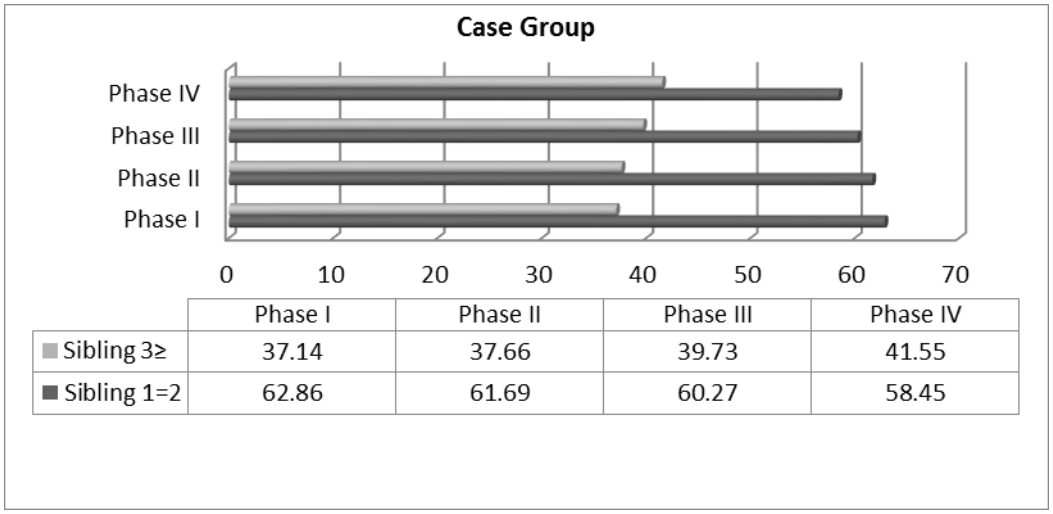


(Figures in x-axis indicates percentage)

Figure 3.16 Bar diagram showing the media exposure of individuals in Case Group

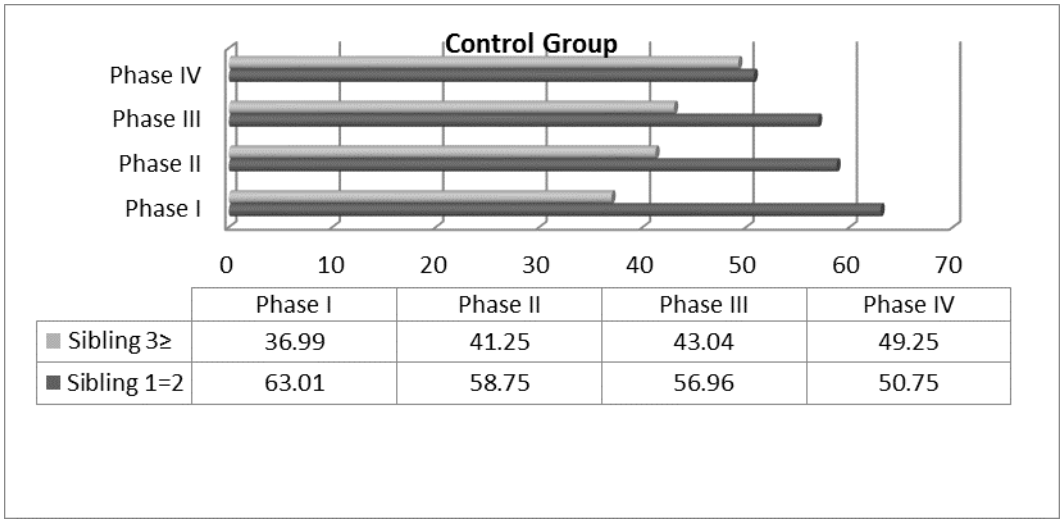
Number of sibling

The number of sibling (3≥ and 1-2) in present study showed that in Case Group were Phase I (37.14 % and 62.86%), Phase II (37.66 % and 61.69 %), Phase III (39.73 % and 60.27%) and Phase IV (41.55% and 58.45%). In Control Group these were found in Phase I (36.99 % and 63.01%), II (41.25% and 58.75%), and III (43.04% and 56.96% and IV (49.25% and 50.75%) respectively. These are graphically represented in **Figure 3.17 and 3.18.**



(Figures in x-axis indicates percentage)

Figure 3.17: Bar diagram showing the number of sib size in Case Group



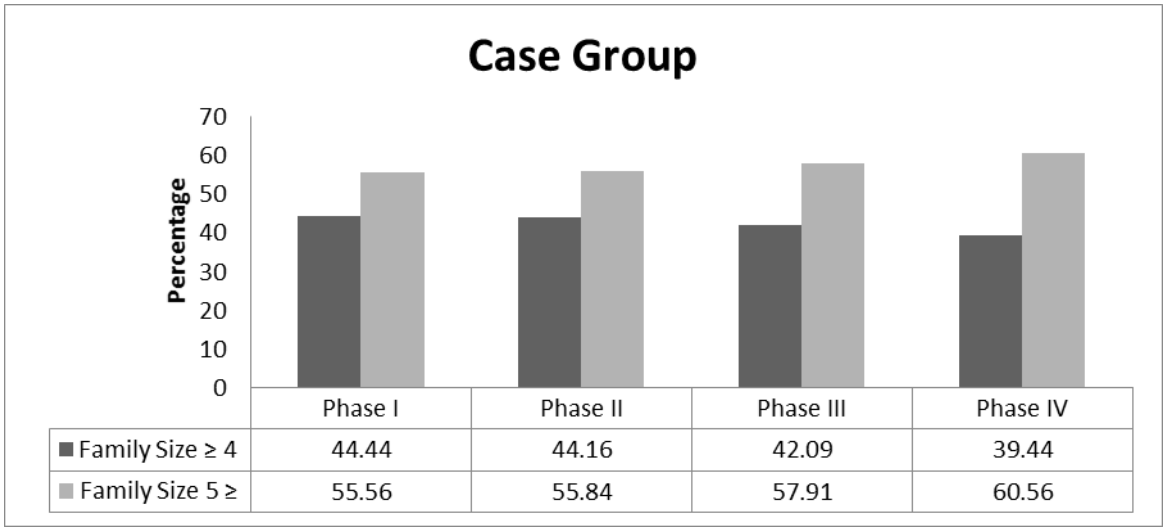
	Phase I	Phase II	Phase III	Phase IV
Sibling 3≥	36.99	41.25	43.04	49.25
Sibling 1=2	63.01	58.75	56.96	50.75

(Figures in x-axis indicates percentage)

Figure 3.18. Bar diagram showing the number of sib size in Control Group

Size of the family

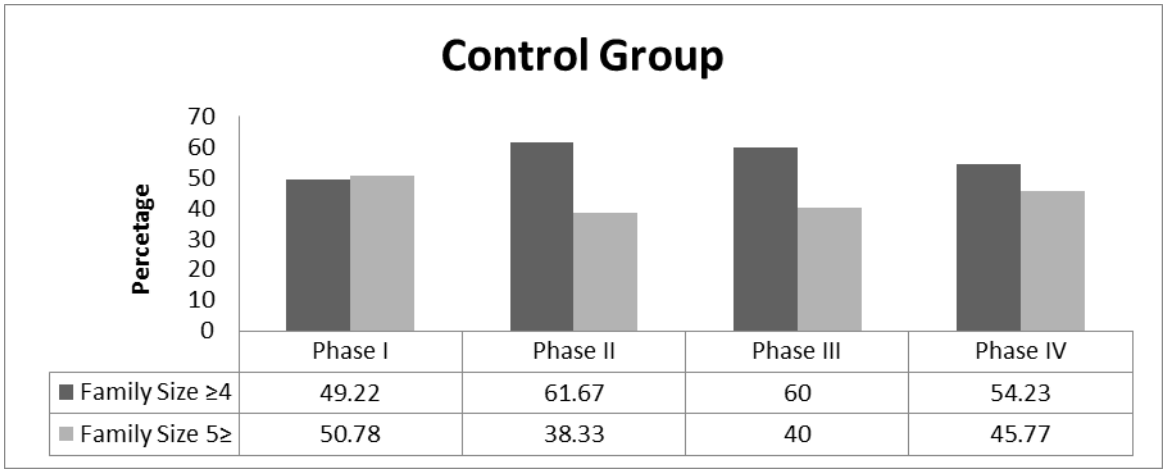
The family size below four members were highest in Case Group of Phase I was 44.44 % and Control Group in Phase II it was 61.67 %. The overall family size ≥5 was seen in Case Group was 61.44 % higher in Phase IV than Control Group (38.56 %) in Phase I. These are graphically represented in **Figure 3.19 and 3.20.**



	Phase I	Phase II	Phase III	Phase IV
Family Size ≥ 4	44.44	44.16	42.09	39.44
Family Size 5 ≥	55.56	55.84	57.91	60.56

(Figures in x-axis indicates percentage)

Figure 3.19: Bar diagram showing the number of family size in Case Group

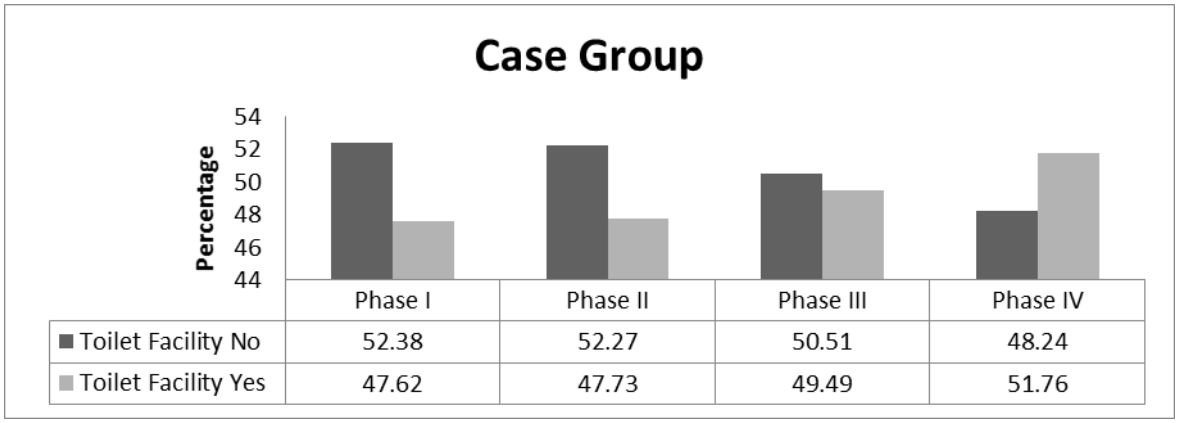


(Figures in x-axis indicates percentage)

Figure 3.20: Bar diagram showing the number of family size in Control Group

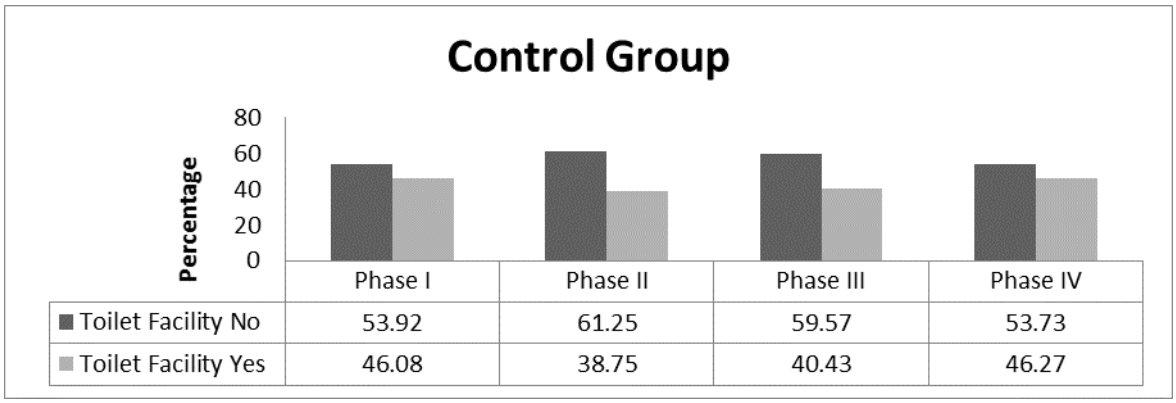
Toilet facilities

The present study showed that 'no' Toilet should in higher percentage found in Case Group (52.38%, 52.27%, 50.51% and 48.24%) and in Control Group (47.62%, 47.73%, 49.49 % and 51.76%) in Phase I, II, III and IV. Those were informed 'yes' were found in Case Group (47.62%, 47.73.%, 49.49%, and 51.76%) and in Control Group (46.08%, 38.75%, 40.43% and 46.27%) in Phase I, II, III and IV. These are graphically represented in **Figure 3.21 and 3.22.**



(Figures in x-axis indicates percentage)

Figure 3.21: Bar diagram showing the percentage of toilet facilities in Case Group

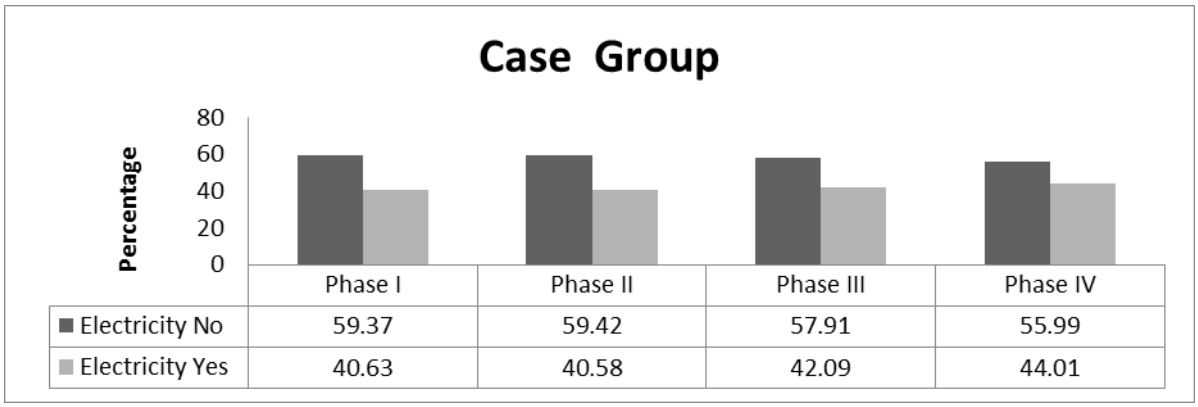


(Figures in x-axis indicates percentage)

Figure 3.22. Bar diagram showing the percentage of toilet facilities in Control Group

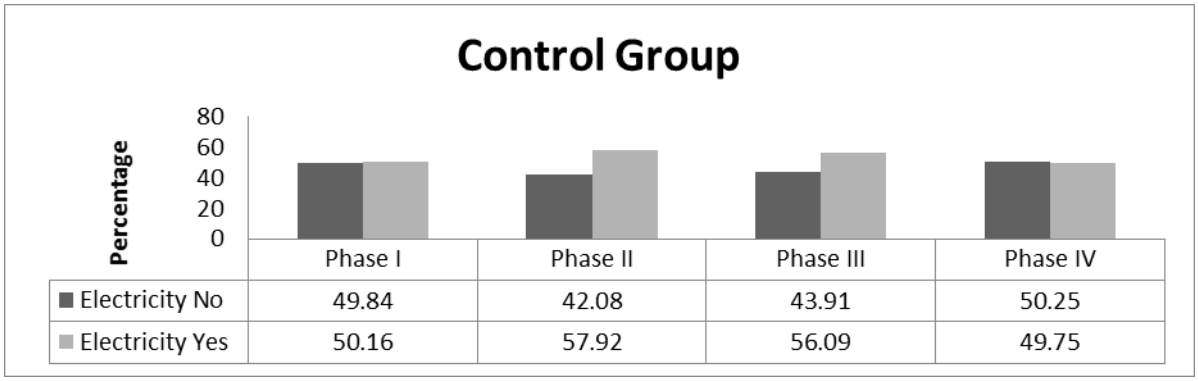
Electricity facilities

The present study showed that 'no' electricity was in higher in Case Group 59.37%, 59.42%, 57.91% and 55.99% and in Control Group 36.99%, 41.25%, 43.04 % and 49.25% in Phase I, II, III and IV. And those were informed 'yes' were found in Case Group (40.63%, 40.58%, 42.09%, and 44.01%. In Control Group 50.16%, 57.92%, 56.09% and 49.75% in Phase I, II, III and IV. These are graphically represented in **Figure 3.23 and 3.24.**



(Figures in x-axis indicates percentage)

Figure 3.1.23: Bar diagram showing electricity facilities in Case Group

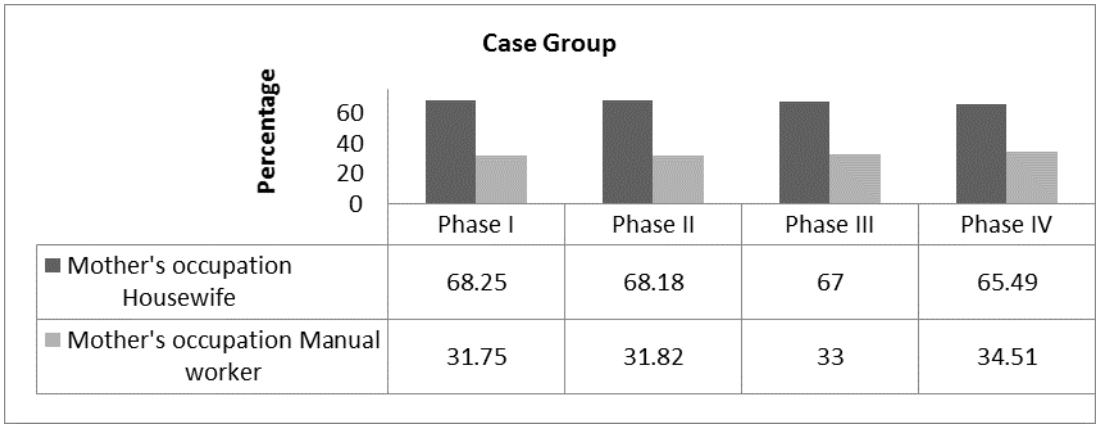


(Figures in x-axis indicates percentage)

Figure 3.24. Bar diagram showing the electricity facilities in Control Group

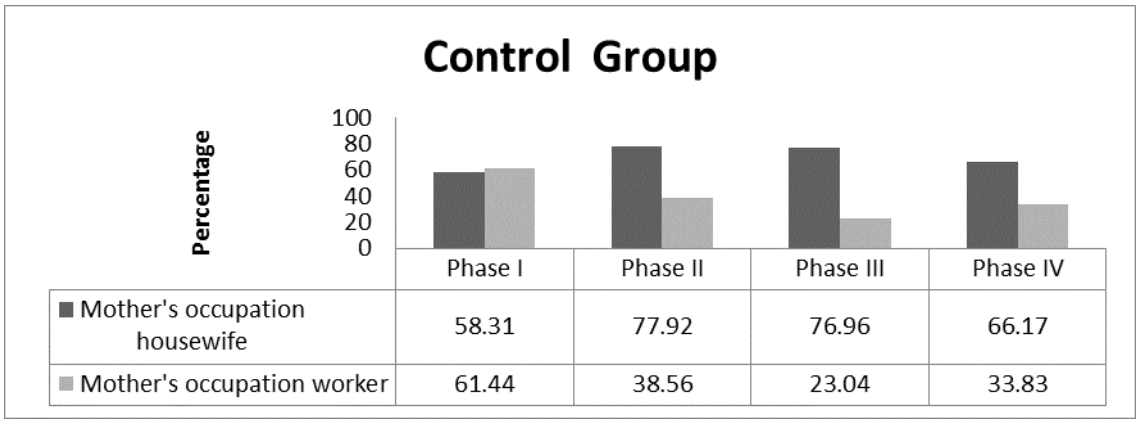
Occupational status of parents

Nearly fathers were working as factory laborers, rickshaw pullers, small vendors like fruit and vegetable vendors, chole/jaljeera vendors and small vendors in street markets, semi-skilled jobs like carpenters, tailors, gardeners, drivers and sanitary worker (treat as manual worker). Clerk, teachers, involved in public and private service sectors and had business (treat as others). Majority of the mothers were housewives (68.25 %) and were not gainfully employed outside home. About (31.75%) of mothers worked as industrial laborers and an equal proportion of mothers worked as domestic helpers. These are graphically represented in **Figure 3.24, 3.25. 3.26 and 3.27.**



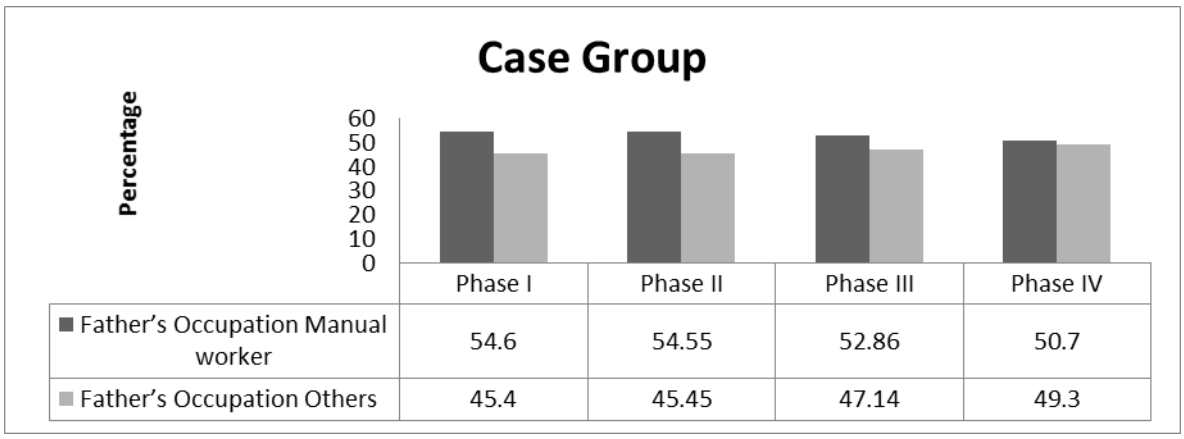
(Figures in x-axis indicates percentage)

Figure 3.24: Bar diagram showing the mother's occupational status in Case Group



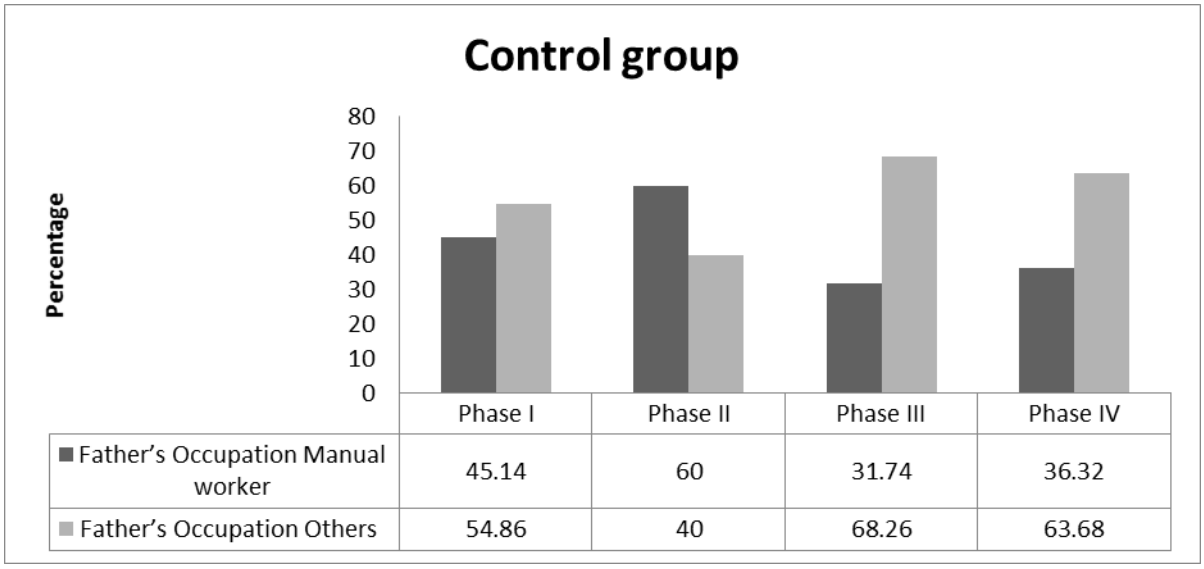
(Figures in x-axis indicates percentage)

Figure 3.25: Bar diagram showing the mother's occupational status in Control Group



(Figures in x-axis indicates percentage)

Figure 3.26: Bar diagram showing the father's occupational status in Case Group

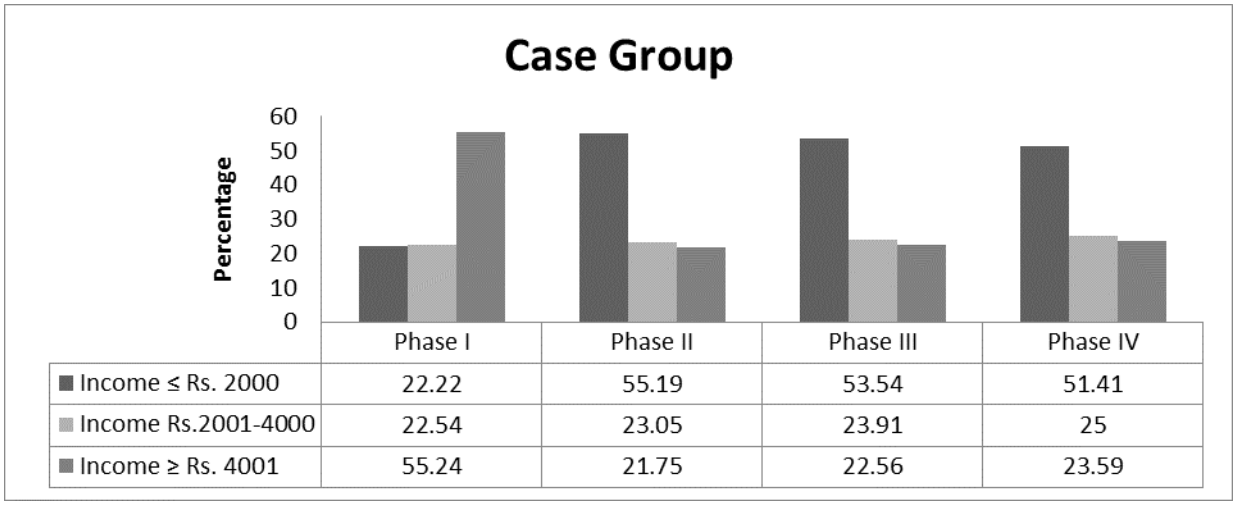


(Figures in x-axis indicates percentage)

Figure 3.27: Bar diagram showing the father's occupational status in Control Group

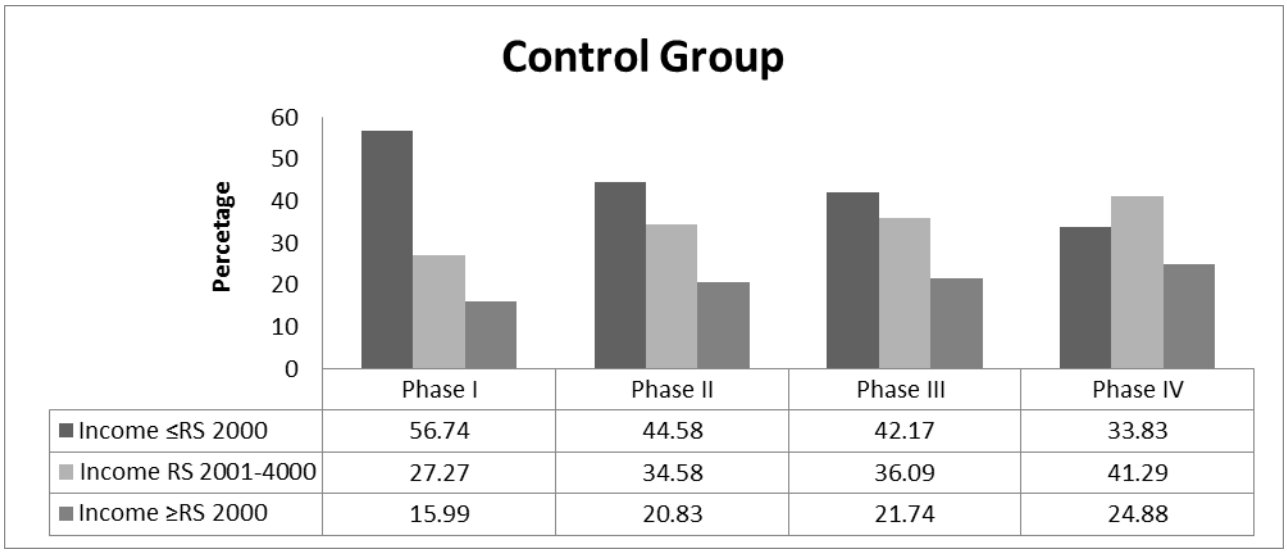
Monthly family income

The present study showed the minimum income was below 2000 in Case and Control Group in Phase I 22.22 % and 56.74%, Phase II 55.19% and 44.58%, Phase III 53.54 % and 42.17 %, Phase IV 51.41 % and 33.83% . Most of the individuals belonged to the Rs.2001-Rs.4000 income category in Phase I (22.54 % and 22.26%), Phase II (23.05 % and 34.58%), Phase III (23.91% and 36.09 %), and Phase IV (25.00 % and 41.29 %). Finally the >Rs. 4000 income category in Phase I 55.24 % and 21.00 %), Phase II 21.75 % and 20.83 %, Phase III 22.56 % and 21.74%, Phase IV 23.59 % and 24.88%. These are graphically represented in **Figure 3.28 and 3.29.**



(Figures in x-axis indicates percentage)

Figure 3.28: Bar diagram showing the family income status among the Case Group



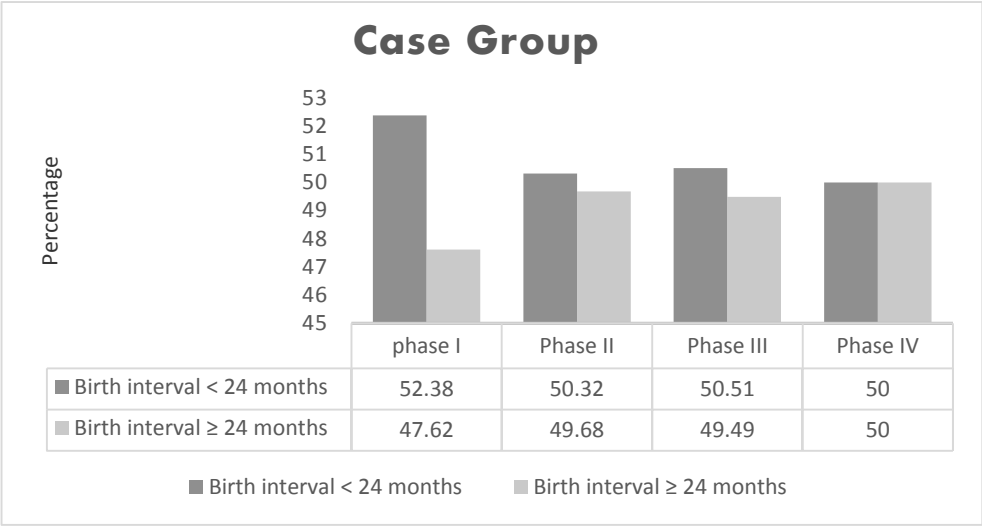
(Figures in x-axis indicates percentage)

Figure 3.29: Bar diagram showing the family income status among the Control Group

Birth interval of child

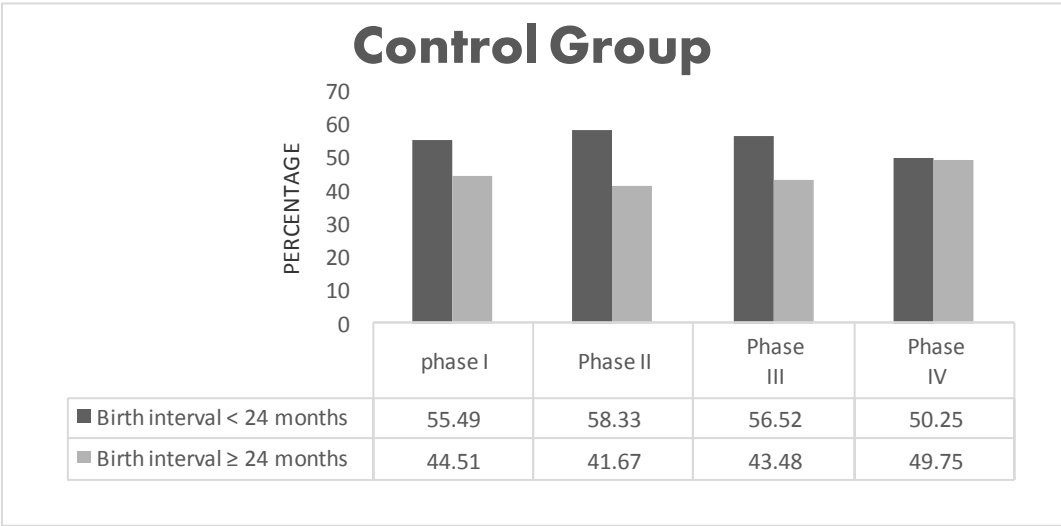
The bar diagram showed that the average interval of child birth below 24 months of mothers was higher in Case Group of Phase I (52.38 %) and Control Group of Phase II (58.33 %) and lower in Case Group of Phase IV (50.00 %) and

Control Group of Phase IV (49.75%) respectively. These are graphically represented in **Figure 3.1.30 and 3.1.31.**



(Figures in x-axis indicates percentage)

Figure 3.30: Bar diagram showing the birth interval among the Case Group of present study children



(Figures in x-axis indicates percentage)

Figure 3.31: Bar diagram showing the birth interval among the Control Group of present study children

Table 3.4 shows the value of the children (both Case and Control) in the present study

Table 3.2: Children covered in the study

S. no	Name of ICDS center	No. of Enrolled Children of registered list	No. of subject Taken children for Case data	No. of subject Taken children for Control data (Not present in School)	Total Considered Children
1	Matigara Tea garden	34 (2.61)	5 (1.58)	12 (2.92)	17 (4.26)
2	Tumbajote	45 (3.46)	12 (3.80)	11 (5.11)	23 (6.78)
3	Beldangi	(58) (4.45)	17 (5.39)	11 (9.98)	28 (9.15)
4	Tumba-I	28 (2.15)	5 (1.58)	13 (3.16)	18 (2.84)
5	Mohargaon Tea garden	65 (4.99)	12 (3.80)	12 (2.92)	24 (3.79)
6	Patiramjote	93 (7.14)	23 (7.30)	11 (10.46)	24 (13.56)
7	KholaBhaktari	30 (2.3)	2 (0.63)	14 (3.89)	16 (4.41)
8	Anil Nagar	30 (2.3)	6 (1.90)	14 (3.41)	20 (4.73)
9	Labour village	120 (9.22)	18 (5.71)	16 (8.76)	34 (5.36)
10	Hara Krishna Pally	37 (2.84)	12 (3.81)	6 (3.89)	18 (2.84)
11	Bhanga Pull-I	50 (3.84)	13 (4.13)	32 (7.79)	45 (7.09)
12	ShuktiGodown	60 (4.61)	5 (1.59)	23 (5.6)	28 (4.42)
13	Labour village Matigara -II	95 (7.3)	23 (7.30)	6 (1.88)	29 (4.57)
14	Thakkar -I	26 (2)	6 (1.90)	8 (2.51)	14 (2.21)
15	Kala Busty	63 (4.84)	13 (4.13)	14 (4.39)	27 (4.26)
16	Parimalnagar	30 (2.3)	11 (3.49)	8 (2.51)	19 (2.99)
17	ShisuDangi	54 (4.15)	15 (4.76)	14 (4.39)	29 (4.57)
18	Tiranga More	30 (2.3)	25 (7.94)	18 (5.64)	43 (6.78)
19	Sukhna Busty	122 (9.37)	12 (3.81)	21 (6.58)	33 (5.21)
20	Chadmuni Tea garden	76 (5.84)	35 (11.11)	13 (40.75)	48 (7.57)
21	Khapril More	44 (3.38)	32 (10.16)	18 (5.64)	50 (7.88)
22	Nischintapur	112 (8.6)	13 (4.13)	24 (7.52)	81 (5.83)
Total		1294 (100)	315 (100)	319 (100)	634 (100)

The Table shows the composition of children (both boys and girls) in the four phases (both Case and Control)

Table 3.3: Composition of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case and Control Group

Data Status	Age (months)	Phase I		Phase II		Phase III		Phase IV	
		Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Case Group	**12-23**	17 (10.37)	27 (17.88)	17 (16.83)	41 (19.81)	17 (10.90)	19 (13.48)	18 (12.59)	20 (14.18)
	24-35	50 (30.49)	35 (23.18)	25 (24.75)	48 (23.19)	35 (22.44)	32 (22.70)	28 (19.58)	21 (14.89)
	36-47	45 (27.44)	23 (15.23)	15 (14.85)	42 (20.29)	43 (27.56)	21 (14.89)	35 (24.48)	24 (17.02)
	48-59	24 (14.63)	30 (19.87)	25 (24.75)	39 (18.84)	31 (19.87)	35 (24.82)	30 (20.98)	34 (24.11)
	60	28 (17.07)	37 (24.50)	19 (18.81)	37 (17.87)	30 (19.23)	34 (24.11)	32 (22.38)	42 (29.79)
	Total	164 (52.06)	151 (47.94)	101 (32.79)	207 (67.21)	157 (52.86)	141 (47.47)	143 (50.35)	141 (49.65)
		315		308		297		284	
Control Group	**12-23**	21 (12.80)	34 (21.94)	10 (8.13)	16 (13.68)	10 (8.47)	15 (13.39)	15 (15.46)	11 (10.58)
	24-35	50 (30.49)	31 (20.00)	28 (22.76)	20 (17.09)	29 (24.58)	20 (17.86)	24 (24.74)	18 (17.31)
	36-47	45 (27.44)	23 (14.84)	31 (25.20)	32 (27.35)	32 (27.12)	31 (27.68)	23 (23.71)	30 (28.85)
	48-59	20 (12.20)	30 (19.35)	27 (21.95)	29 (24.79)	22 (18.64)	28 (25.00)	15 (15.46)	33 (31.73)
	60	28 (17.07)	37 (23.87)	27 (21.95)	20 (17.09)	25 (21.19)	18 (16.07)	20 (20.62)	12 (11.54)
	Total	164 (51.41)	155 (48.59)	123 (51.25)	117 (48.75)	118 (51.34)	112 (48.69)	97 (48.26)	104 (51.74)
		319		240		230		201	

Perthensis indicate percentage

USING THE WHOLE DATA PHASE-WISE (CROSS-SECTIONAL)

Changes of anthropometric variables of Case and Control Group

The mean and standard deviation of the anthropometric variables (Height, Weight, MUAC. Head Circumference, Triceps and Sub –Scapular skin fold measurement) of Case and Control Group in four Phases of present study is presented in **Table 3.4**. From Phase I to Phase IV the variables were gradually increased in age wise.

These point changes occurs among Case and Control Group of data. The ANOVA test shows that significant association in both Group except in Phase I, Phase II among boys triceps skin fold data among girls in 12-23 months (Sub scapular skin fold), 36-47 months (triceps skin fold, sub scapular skin fold, MUAC) respectively.

The result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.4 and 3.6.** The result also shows that there was a point difference between girls and boys in each Phase of the present study.

In case of both boys and girls aged 12-23 months, it is seen that thre are increased in all the anthropometric measurement from Phase I to Phase IV Using Anova for Case Group (**Table 3.5**), and for Control Group (**Table 3.7**). Sex differences were observed between boys and girls in each phase. However differences in height, weight, MUAC, HC were statistically significant ($p<0.05$) in most cases. But in case of Control Group differences in height, weight, MUAC, HC, sub scapula, and Triceps in each cases.

Table 3.4: Changes in age and sex specific mean of anthropometric variables of Case Group over four interval study periods.

Age (months)	Variables	Phase I (315)		F	Phase II (308)		F	Phase III (297)		F	Phase IV (284)		F
		Boys (164)	Girls (151)		Boys (101)	Girls (207)		Boys (157)	Girls (141)		Boys (143)	Girls (141)	
12-23	Height	71.18±4.07	70.18±4.97	11.21**	71.29±5.19	70.29±8.09	8.21*	71.40±6.31	70.41±4.21	3.87	71.51±9.43	70.52±4.33	9.21
	Weight	8.16±1.5	4.15±1.65	9**	8.27±4.7	4.26±4.77	6	8.38±3.59	4.37±7.89	6.62	8.49±6.71	4.49±1.01	7
	MUAC	12.32±1.12	10.85±1.04	6.79**	12.43±2.24	10.96±4.16	3.79	12.54±3.36	11.07±7.28	9.37	12.65±6.48	11.19±0.40	4.79
	Head C	43.75±2.20	42.15±2.50	4.58**	43.86±3.32	42.26±5.62	1.58	43.97±4.44	42.37±8.74	12.12*	43.97±4.44	42.49±1.86	2.58
	Triceps	6.20±1.31	5.80±7.80	2.37	6.31±2.43	5.92±0.92	0.63	6.42±3.55	6.03±4.04	1.28	6.58±3.8	6.14±7.16	0.37
	Sub-scapular	4.06±1.14	4.08±1.19	5.12	4.17±2.26	4.17±4.31	2.12	4.28±3.38	4.28±7.43	1.32	4.59±6.51	4.40±0.55	3.12
24-35	Height	82.18±3.07	80.18±4.97	7.87	82.29±4.19	80.29±8.09	4.87	82.40±5.31	80.41±1.21	3.92	82.71±8.44	80.52±4.33	5.87
	Weight	8.24±1.21	41.51±6.5	10.62*	8.35±2.33	4.26±4.77	7.62	8.46±3.45	4.37±7.89	6.52	8.77±6.58	4.49±1.01	8.62
	MUAC	12.43±1.24	10.85±1.04	13.37*	12.54±2.36	10.96±4.16	10.37*	12.65±3.48	11.07±7.28	0.58	12.96±6.61	11.19±0.40	11.37*
	Head C	43.79±2.60	42.15±2.50	16.12*	43.90±3.72	42.26±5.62	13.12*	44.01±4.84	42.37±8.74	1.63	44.32±7.97	42.49±1.86	14.12*
	Triceps	6.80±1.40	5.80±7.80	2.72	6.91±2.52	5.92±0.92	0.28	7.02±3.64	6.03±4.04	3.84	7.33±6.77	6.14±7.16	0.72
	Sub-scapular	4.06±1.14	4.06±1.19	5.32	4.17±2.26	4.17±4.31	2.32	4.28±3.38	4.28±7.43	1.79	4.59±6.51	4.40±0.55	3.32
36-47	Height	89.08±4.37	86.18±4.97	7.92	89.19±5.49	86.29±8.09	4.92	89.30±6.61	86.41±1.21	0.66	89.61±9.74	86.52±4.33	5.92
	Weight	9.21±2.45	8.15±1.65	10.52*	9.32±3.57	8.26 ±4.77	7.52*	9.43±4.69	8.37±7.89	0.47	9.74±7.82	8.49±1.21	8.52
	MUAC	13.85±1.04	13.95±1.64	4.58	13.96±2.16	14.06 ± 4.76	1.58	14.07±3.28	14.17±7.88	1.6	14.38±6.41	14.29±1.31	2.58
	Head C	45.65±1.52	45.53±1.52	2.37	45.76±2.64	45.64 ± 4.64	0.63	45.87±3.76	45.75±7.76	2.73	46.18±6.89	45.87±1.76	0.37
	Triceps	7.81±1.80	7.82±1.35	0.16	7.92±2.92	7.93 ± 4.47	2.84	8.03±4.04	8.04±7.59	3.87	8.34±7.17	8.16±4.71	1.84
	Sub-scapular	5.06±1.13	4.50±1.16	2.21	5.17±2.25	5.17 ± 4.28	0.79	5.28±3.37	5.28±7.40	6.62	5.59±6.50	5.40±2.52	0.21
48-59	Height	95.08±4.37	94.18±4.97	3.34	95.19±5.49	94.29 ±3.09	0.34	95.30±6.61	94.41±1.21	9.37	95.61±9.74	94.52±4.43	1.34
	Weight	9.30±2.45	8.25±1.75	4.47	9.38±3.60	8.28 ± 4.80	1.47	9.45±4.71	8.39±7.95	12.12*	9.86±7.82	8.52±1.31	2.47
	MUAC	13.88±1.14	13.97±1.44	5.6	14.01±2.36	14.96 ±4.76	2.6	14.17±3.38	14.21±7.89	1.28	14.43±6.45	15.29±1.20	3.6
	Head C	45.68±1.45	45.57±1.62	6.73	45.78±2.68	45.64 ±464	3.73	45.91±3.86	45.79±7.87	1.32	46.21±6.76	45.86±3.88	4.73
	Triceps	7.85±1.82	7.92±1.45	7.86	7.96±1.23	7.98 ±4.27	4.86	8.13±4.14	8.12±7.62	2.73	8.42±7.21	8.17±1.79	5.86
	Sub-scapular	5.07±1.23	5.06±1.26	8.99	5.27±2.15	5.32 ±4.81	5.99	5.31±3.47	5.31±7.45	3.86	5.69±6.52	5.34±1.12	6.99
60	Height	102.08±2.37	93.44±4.98	10.12*	102.19±3.49	94.55 ±4.19	7.12	102.3±4.41	96.67±1.41	4.99	102.61±7.74	99.78±4.33	8.12
	Weight	9.32±3.45	8.15±3.65	11.25*	9.32±4.57	8.26±6.77	8.25	9.47±5.69	8.37±9.89	6.12	9.73±8.62	8.35±3.01	9.25
	MUAC	13.90±1.04	13.95±1.64	2.38	13.96±2.16	14.98±4.16	9.38*	14.07±3.28	14.17±7.88	7.25	14.41±6.51	14.29±1.21	10.38*
	Head C	45.70±1.52	45.53±1.52	3.51	45.76±2.64	45.71±4.74	10.51*	45.87±376	45.75±7.76	8.38*	46.16±6.69	45.87±3.42	1.51
	Triceps	7.89±1.80	7.82±1.35	0.64	7.92±2.92	7.99±4.67	11.64*	8.03±4.04	8.43±7.59	9.51*	8.64±7.27	8.16±0.71	2.64
	Sub-scapular	5.10±1.13	5.16±1.16	15.77**	5.47±2.25	5.32±4.28	12.77*	5.28±3.37	5.18±7.31	11.64*	5.19±6.10	5.46±1.52	13.77
Total	Height	94.08±4.37	92.18±4.97	4.34	93.19±5.49	91.29 ±3.09	0.34	93.30±6.61	93.41±1.21	9.37	94.61±9.74	93.52±4.43	1.34*
	Weight	9.10±2.45	7.25±1.75	5.47	8.38±3.60	7.28 ± 4.80	1.47	7.45±4.71	7.39±7.95	10.12*	8.86±7.82	6.52±1.31	12.47*
	MUAC	11.88±1.14	11.97±1.44	5.6	12.01±2.36	11.96 ±4.76	12.6*	12.17±3.38	12.21±7.89	0.28	13.43±6.45	11.29±1.20	3.6
	Head C	42.68±1.45	43.57±1.62	4.73	44.78±2.68	44.64 ±464	3.73	43.91±3.86	44.79±7.87	0.32	45.21±6.76	43.86±3.88	0.73
	Triceps	5.85±1.82	7.92±1.45	12.86*	6.96±1.23	6.98 ±4.27	0.86	7.13±4.14	7.12±7.62	0.73	7.42±7.21	7.17±1.79	5.86
	Sub-scapular	3.07±1.23	5.06±1.26	10.99*	4.27±2.15	5.32 ±4.81	5.99	5.31±3.47	4.31±7.45	3.86	4.69±6.52	4.34±1.12	6.99

Table 3.5. ANOVA test-value of anthropometric variables of Case Group over four interval study periods.

Age (months)	Variables	Phase I (315) vs. II (308) (p-value)		Phase II (308) vs. III (297) (p-value)		Phase III (297) vs. IV (284) (p-value)		Phase IV (284) vs. I (315) (p-value)	
		Boys vs Boys	Girls vs Girls	Boys vs Boys	Girls vs. Girls	Boys vs. Boys	Girls vs. Girls	Boys vs. Boys	Girls vs. Girls
12-23	Height	0.035*	0.019*	0.011*	0.045*	0.006*	0.008*	0.021*	0.015*
	Weight	0.009*	0.012*	0.016*	0.017*	0.028*	0.009*	0.026*	0.023*
	MUAC	0.029*	0.014*	0.3	0.011*	0.009*	0.033*	0.019*	0.11
	Head C	0.037*	0.013*	0.014*	0.042*	0.019*	0.01*	0.009*	0.03*
	Triceps	0.008*	0.029*	0.29	0.012*	0.103	0.01*	0.093	0.087
	Sub scapular	0.024*	0.29	0.003*	0.039*	0.025*	0.037*	0.05*	0.1
24-35	Height	0.035*	0.03*	0.09	0.04*	0.005*	0.034*	0.001*	0.024*
	Weight	0.013*	0.015*	0.011*	0.043*	0.013*	0.012*	0.017*	0.013*
	MUAC	0.024*	0.003*	0.016*	0.014*	0.011*	0.013*	0.002*	0.098
	Head C	0.023*	0.027*	0.3	0.015*	0.003*	0.037*	0.088	0.025*
	Triceps	0.036*	0.026*	0.014*	0.046*	0.096	0.023*	0.096	0.026*
	Sub scapular	0.034*	0.09	0.29	0.032*	0.01*	0.036*	0.016*	0.03*
36-47	Height	0.023*	0.027*	0.003*	0.041*	0.026*	0.038*	0.004*	0.18
	Weight	0.038*	0.024*	0.09	0.047*	0.003*	0.121	0.005*	0.027*
	MUAC	0.037*	0.28	0.011*	0.13	0.15	0.008*	0.013*	0.027*
	Head C	0.022*	0.025*	0.016*	0.051*	0.015*	0.009*	0.008*	0.019*
	Triceps	0.121	0.1	0.033*	0.049*	0.016*	0.049*	0.09	0.015*
	Sub scapular	0.033*	0.11	0.008*	0.013*	0.02*	0.01*	0.012*	0.023*
48-59	Height	0.021*	0.03*	0.009*	0.123	0.018*	0.17	0.061	0.11
	Weight	0.114	0.087	0.033*	0.027*	0.017*	0.02*	0.052*	0.009*
	MUAC	0.033*	0.25	0.01*	0.044*	0.003*	0.079	0.045*	0.033*
	Head C	0.017*	0.098	0.01*	0.031*	0.019*	0.087	0.017*	0.01*
	Triceps	0.012*	0.023*	0.037*	0.055*	0.004*	0.16	0.011*	0.01*
	Sub scapular	0.032*	0.011*	0.034*	0.033*	0.097	0.04*	0.042*	0.037*
60	Height	0.017*	0.094	0.012*	0.038*	0.105	0.05*	0.012*	0.034*
	Weight	0.01*	0.021*	0.013*	0.017*	0.018*	0.13	0.039*	0.012*
	MUAC	0.031*	0.016*	0.037*	0.014*	0.006*	0.08	0.04*	0.013*
	Head C	0.027*	0.18	0.023*	0.052*	0.007*	0.081	0.043*	0.037*
	Triceps	0.01*	0.009*	0.036*	0.098	0.015*	0.12	0.014*	0.023*
	Subscapular	0.031*	0.3	0.038*	0.023*	0.01*	0.052*	0.015*	0.036*

(*=p>0.005)

Table 3.6. Changes in age and sex specific mean of anthropometric variables of Control Group over four interval study periods.

Age (months)	Variables	Phase I (319)		F	Phase II (240)		F	Phase III (230)		F	Phase IV (201)		F
		Boys (164)	Girls (155)		Boys (123)	Girls (117)		Boys (118)	Girls (112)		Boys (97)	Girls (104)	
12-23	Height	72.50±6.38	70.5±07.28	11.37	72.51±5.57	72.49±7.20	10.37	72.84±7.07	72.81±0.33	8.37	73.16±0.20	73.12±3.46	6.37
	Weight	8.48±3.66	4.47±3.96	14.12	8.49±2.85	8.47±4.48	13.12	8.82±4.35	8.78±7.61	11.12	9.13±7.48	9.10±0.74	9.12
	MUAC	12.64±3.43	11.17±3.35	0.72	12.65±2.62	12.63±4.25	0.28	12.98±4.12	12.94±7.38	2.28	13.29±7.25	13.26±0.51	4.28
	Head C	44.07±4.51	42.47±4.81	3.32	44.08±3.70	44.06±5.33	2.32	44.41±5.20	44.37±8.46	0.32	44.72±8.33	44.69±1.59	1.68
	Triceps	6.52±3.62	6.13±0.11	5.92	6.53±2.81	6.51±4.44	4.92	6.86±4.31	6.82±7.57	2.92	7.17±7.44	7.14±0.70	0.92
	Subscapular	4.38±3.45	4.38±3.50	8.52	4.39±2.64	4.37±4.27	7.52	4.72±4.14	4.68±7.40	5.52	5.03±7.27	5.00±0.53	3.52
24-35	Height	82.50±5.38	80.50±7.28	2.58	82.51±4.57	82.49±6.20	1.58	82.84±6.07	82.80±9.33	-0.42	83.15±9.20	831±2246	2.42
	Weight	8.56±3.52	4.47±3.96	0.37	8.57±2.71	8.55±4.34	0.63	8.90±4.21	8.86±7.47	-2.63	9.21±7.34	9.18±0.60	4.63
	MUAC	12.75±3.55	11.17±3.35	1.84	12.76±2.74	12.74±4.37	2.84	13.09±4.24	13.05±7.50	-4.84	13.40±7.37	13.37±0.63	6.84
	Head C	44.11±4.91	42.47±4.81	0.21	44.12±4.10	44.10±5.73	0.79	44.45±5.60	44.41±8.86	-2.79	44.76±8.73	44.73±1.99	4.79
	Triceps	7.12±3.71	6.13±0.11	1.34	7.13±2.90	7.11±4.53	0.34	7.46±4.40	7.42±7.66	-1.66	7.77±7.53	7.74±0.79	3.66
	Subscapular	4.38±3.45	43.83±5.0	2.47	4.39±2.64	4.37±4.27	1.47	4.72±4.14	4.68±7.40	-0.53	5.03±7.27	5.00±0.53	-2.53
36-47	Height	89.40±6.68	86.50±7.28	3.6	89.41±5.87	89.39±7.50	2.6	89.74±7.37	89.71±0.63	0.6	90.06±0.50	90.02±3.76	-1.4
	Weight	9.53±4.76	8.47±3.96	4.73	9.54±3.95	9.52±5.58	3.73	9.87±5.45	9.83±8.71	1.73	10.18±8.58	10.15±1.84	-0.27
	MUAC	14.17±3.35	14.27±3.95	5.86	14.18±2.54	14.16±4.17	4.86	14.51±4.04	14.47±7.30	2.86	14.82±7.17	14.79±0.43	0.86
	Head C	45.97±3.83	45.85±3.83	6.99	45.98±3.02	45.96±4.65	5.99	46.31±4.52	46.27±7.78	3.99	46.62±7.65	46.59±0.91	1.99
	Triceps	8.13±4.11	8.14±3.66	9.21*	8.14±3.30	8.12±4.93	8.21	8.47±4.80	8.43±8.06	6.21	8.78±7.93	8.75±1.19	4.21
	Subscapular	5.38±3.44	5.38±3.47	7.11	5.39±2.63	5.37±4.26	6.10	5.72±4.13	5.68±7.39	4.01	6.03±7.26	6.00±0.52	3
48-59	Height	95.406.68	94.50±7.28	5.79	95.41±5.87	95.39±7.50	4.79	95.74±3.37	95.71±0.63	3.79	96.06±0.50	96.02±3.76	0.79
	Weight	9.53±4.76	8.47±3.96	3.58	9.54±3.95	9.52±5.58	2.58	9.87±5.45	9.83±8.71	1.58	10.18±8.58	10.15±1.84	-1.42
	MUAC	14.17±3.35	14.27±3.95	1.37	14.18±2.54	14.16±4.17	0.37	14.51±4.04	14.47±7.30	-0.63	14.82±7.17	14.79±0.43	-3.63
	Head C	45.97±3.83	45.85±3.83	4.12	45.98±3.02	45.96±4.65	3.12	46.31±4.52	46.27±7.78	2.12	46.62±7.65	46.59±0.91	-0.88
	Triceps	8.13±4.11	8.14±3.66	2.87	8.14±3.30	8.12±4.93	3.87	8.47±4.80	8.43±8.06	1.87	8.78±7.93	8.75±1.19	1.87
	Subscapular	5.38±3.44	5.38±3.47	5.62	5.39±2.63	5.37±4.26	6.62	5.72±4.13	5.68±7.39	4.62	6.03±7.26	6.00±0.52	6.62
60	Height	102.40±4.68	99.76±7.28	5.12	102.41±3.87	102.39±5.50	6.12	10.27±45.37	102.70±4.81	4.12	103.05±8.50	103.0±2176	6.12
	Weight	9.53±5.76	8.47±5.96	6.25	9.54±4.95	9.52±6.58	7.25	9.87±6.45	9.83±9.71	5.25	10.18±9.58	1015±284	7.25
	MUAC	14.17±3.35	14.27±3.95	7.38	14.18±2.54	14.16±4.17	8.38	14.51±4.04	14.47±7.30	6.38	14.82±7.17	1479±043	8.38
	Head C	45.97±3.83	45.85±3.83	8.51	45.98±3.02	45.96±4.65	9.51	46.31±4.52	46.27±7.78	7.51	46.62±7.65	46.59±091	9.51
	Triceps	8.13±4.11	8.14±3.66	9.64*	8.14±3.30	8.12±4.93	10.64	8.47±4.80	8.43±8.06	8.64	8.78±7.93	8.75±1.19	10.64
	Subscapular	5.38±3.44	5.38±3.47	10.77*	5.39±2.63	5.37±4.26	11.77*	5.72±4.13	5.68±7.39	9.77	6.03±7.26	6.00±0.52	11.77
Total	Height	93.406.68	93.50±7.28	12.79*	94.41±5.87	94.39±7.50	0.79	93.74±3.37	93.71±0.63	13.79*	94.06±0.50	95.02±3.76	0.79
	Weight	7.53±4.76	7.47±3.96	0.58	7.54±3.95	8.52±5.58	0.58	7.87±5.45	5.83±8.71	11.58*	10.18±8.58	9.15±1.84	-1.42
	MUAC	13.17±3.35	12.27±3.95	5.86	12.18±2.54	12.16±4.17	4.86	13.51±4.04	11.47±7.30	2.86	12.82±7.17	13.79±0.43	0.86
	Head C	44.97±3.83	43.85±3.83	0.99	42.98±3.02	44.96±4.65	0.99	44.31±4.52	41.27±7.78	3.99	44.62±7.65	44.59±0.91	0.99
	Triceps	7.13±4.11	7.14±3.66	9.21	7.14±3.30	7.12±4.93	8.21	6.47±4.80	7.43±8.06	6.21	7.78±7.93	8.75±1.19	4.21
	Subscapular	4.38±3.44	4.12±3.47	0.77	4.39±2.63	5.37±4.26	14.77*	4.72±4.13	4.68±7.39	9.77	5.03±7.26	6.00±0.52	11.77*

Table 3.7 ANOVA test-value of anthropometric variables of Control Group over four interval study periods.

Age (months)	Variables	Phase I (319) vs. II (240) (p-value)		Phase II (240) vs. III (230) (p-value)		Phase III (230) vs. IV (201) (p-value)		Phase IV (201) vs. I (319) (p-value)	
		Boys vs. Boys	Girls vs. Girls	Boys vs. Boys	Girls vs. Girls	Boys vs. Boys	Girls vs. Girls	Boys vs. Boys	Girls vs. Girls
12-23	Height	0.23	0.036*	0.019*	0.01*	0.011*	0.018*	0.027*	0.043*
	Weight	0.022**	0.051*	0.013*	0.023*	0.025*	0.027*	0.017*	0.049*
	MUAC	0.08	0.027*	0.03*	0.061	0.15	0.015*	0.017*	0.017*
	Head C	0.06	0.03*	0.027*	0.023*	0.011*	0.012*	0.021*	0.011*
	Triceps	0.07	0.031*	0.027*	0.028*	0.006*	0.013*	0.022*	0.012*
	Subscapular	0.058*	0.013*	0.025*	0.021*	0.009*	0.021*	0.023*	0.039*
24-35	Height	0.08	0.032*	0.03*	0.014*	0.019*	0.014*	0.023*	0.014*
	Weight	0.010**	0.055*	0.011*	0.102	0.005*	0.02*	0.024*	0.123
	MUAC	0.048*	0.033*	0.016*	0.019*	0.016*	0.034*	0.024*	0.13
	Head C	0.21	0.038*	0.3	0.015*	0.026*	0.02*	0.029*	0.047*
	Triceps	0.024*	0.017*	0.014*	0.018*	0.01*	0.013*	0.031*	0.041*
	Subscapular	0.19	0.014*	0.29	0.112	0.096	0.022*	0.031*	0.015*
36-47	Height	0.007**	0.052*	0.003*	0.064	0.058*	0.012*	0.032*	0.04*
	Weight	0.084	0.045*	0.09	0.003*	0.08	0.011*	0.033*	0.044*
	MUAC	0.17	0.042*	0.28	0.004*	0.019*	0.024*	0.033*	0.027*
	Head C	0.13	0.046*	0.11	0.097	0.048	0.028*	0.037*	0.025*
	Triceps	0.16	0.043*	0.25	0.006*	0.21	0.025*	0.034*	0.03*
	Subscapular	0.094	0.049*	0.098	0.078	0.024*	0.03*	0.035*	0.011*
48-59	Height	0.049**	0.017*	0.021*	0.085	0.19	0.018*	0.008*	0.016*
	Weight	0.01**	0.011*	0.009*	0.014*	0.007*	0.007*	0.009*	0.3
	MUAC	0.02*	0.012*	0.012*	0.099	0.084	0.008*	0.01*	0.014*
	Head C	0.079	0.039*	0.029*	0.007*	0.17	0.005*	0.01*	0.29
	Triceps	0.04*	0.014**	0.015*	0.105	0.13	0.01*	0.012*	0.003*
	Subscapular	0.059*	0.123	0.026*	0.017*	0.16	0.105	0.114	0.09
60	Height	0.052*	0.13	0.024*	0.01*	0.094	0.112	0.121	0.28
	Weight	0.12	0.047*	0.1	0.023*	0.049*	0.029*	0.038*	0.11
	MUAC	0.081	0.041*	0.087	0.061	0.01*	0.031*	0.036*	0.25
	Head C	0.05*	0.015**	0.023*	0.023*	0.02*	0.011*	0.013*	0.098
	Triceps	0.087	0.04*	0.094	0.028*	0.079	0.032*	0.037*	0.021*
	Sub scapular	0.15	0.044*	0.18	0.021*	0.04*	0.026*	0.035*	0.009*

Changes of anthropometric variables of Case and Control Group based on WHO z-score

The mean and standard deviation(±) of the WHO z-score anthropometric variables of Height-for –age (HAZ), Weight-for-age (WAZ), MUAC (mid upper arm circumference)-for-age (MUACZ), Head Circumference-for-age (HAZ), Triceps skin fold for-age (TSFZ) and Sub–Scapular of skin fold-for-age (SSFZ) measurement of Case and Control Group are presented in Tables 3.8 and 3.9. From Phase I to Phase IV the variables gradually increases or decreases in age wise.

All the anthropometric measurement from Phase I to Phase IV using Schieff's test for Case Group and for Control Group is shown in **Table 3.10**. Sex differences were observed between boys and girls in each phase. However differences in Height-for –age (HAZ), Weight-for-age (WAZ), MUAC (mid upper arm circumference)-for-age (MUACZ), Head Circumference-for-age (HAZ), Triceps skin fold for-age (TSFZ) and Sub–Scapular of skin fold-for-age (SSFZ) were statistically significant ($p<0.05$) in most cases. But in case of Control Group differences in Height-for –age (HAZ), Weight-for-age (WAZ), MUAC (mid upper arm circumference)-for-age (MUACZ), Head Circumference-for-age (HAZ), Triceps skin fold for-age (TSFZ) and Sub–Scapular of skin fold-for-age (SSFZ) in each cases.

The overall result shows that statistical significant association among boys and girls with Scheffe's test. The association of changes in point difference adjacent in increase of age that was found in different Phases of Case and Control study

Table: 3.8. Changes in age and sex specific mean of WHO z-score variables of Case Group over four interval study periods.

Age (months)	Variables	Phase I (315)		Phase II (308)		Phase III (297)		Phase IV (284)		Schieff's test	
		Boys (164)	Girls (151)	Boys (101)	Girls (207)	Boys (157)	Girls (141)	Boys (143)	Girls (141)		
12-23	HAZ	-1.24±1.24	-1.14±1.23	-1.25±7.57	-2.20±9.19	-3.35±3.51	-1.15±2.43	0.49±1.23	-3.23±1.36	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3# 1vs4* 4vs3≠
	WAZ	-1.23±2.58	-1.13±2.57	-1.28±4.96	1.11±3.47	1.24±1.59	1.68±1.33	1.48±2.57	1.60±8.32		
	MUACZ	-2.68±9.06	-2.48±9.04	0.58±2.33	-1.28±4.93	-4.1±9.89	-1.10±3.15	-1.43±9.04	-3.46±6.44		
	HCZ	1.71±9.74	1.51±9.75	2.14±7.16	1.30±9.92	1.3±9.01	1.62±8.64	1.96±9.75	2.66±6.66		
	TSFZ	-1.66±3.20	-1.46±3.21	1.00±7.55	-1.05±0.94	-1.39±2.08	-1.27±0.57	-0.41±3.21	-5.62±4.72		
	SSFZ	1.82±4.34	1.72±4.33	2.12±8.45	1.36±9.65	1.23±1.87	1.54±4.57	2.07±4.33	2.59±8.04		
24-35	HAZ	-2.63±1.68	-1.53±1.67	1.61±5.97	-1.01±1.41	0.07±5.56	-2.22±8.06	-0.38±1.67	-4.27±3.06	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3≠ 2vs3* 1vs4* 4vs3≠
	WAZ	1.63±4.42	1.52±3.44	-2.28±6.67	1.44±0.55	1.59±0.26	1.5±9.66	1.8±8.44	2.37±2.72		
	MUACZ	-1.43±1.01	-0.13±1.51	-2.60±9.81	1.21±3.02	0.49±3.21	0.43±3.59	-3.18±1.21	-1.16±5.66		
	HCZ	1.68±5.14	1.58±5.18	-2.60±4.82	1.50±2.38	1.30±9.84	1.69±1.65	1.93±5.18	3.02±1.83		
	TSFZ	-1.20±1.21	-1.12±1.1	-4.19±1.11	-1.32±4.06	3.47±1.32	-2.21±8.98	-4.95±1.43	-2.76±8.58		
	SSFZ	1.37±8.85	0.17±8.88	3.43±7.57	1.66±9.07	1.49±6.81	-3.93±0.78	0.62±8.88	1.18±6.31		
36-47	HAZ	-3.51±4.68	-0.51±4.74	-1.24±8.12	1.08±7.85	-0.04±9.32	-4.20±5.19	-0.26±4.74	-2.37±0.27	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠
	WAZ	1.66±2.14	1.26±2.24	2.3±8.46	1.37±5.29	1.41±5.08	1.61±6.52	1.91±2.24	2.52±0.61		
	MUACZ	1.63±4.47	1.3±3.44	-3.15±7.57	-2.20±9.19	-0.35±3.51	-2.15±2.43	0.49±1.23	-1.23±1.36		
	HCZ	-1.48±1.46	-0.38±1.36	1.58±4.96	1.11±3.47	1.24±1.59	1.68±1.33	1.48±2.57	1.60±8.32		
	TSFZ	1.35±8.31	1.25±8.32	0.58±2.33	1.28±4.93	-0.19±.89	-1.10±3.15	-2.43±9.04	-1.46±6.44		
	SSFZ	-0.71±4.44	-0.216.44	2.14±7.16	1.30±9.92	1.3±9.01	-1.62±8.64	-3.15±7.57	-3.20±9.19		
48-59	HAZ	2.41±4.66	2.11±6.66	1.10±7.55	1.05±0.94	-0.39±2.08	-2.27±0.57	1.58±4.96	-1.11±3.47	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3≠ 1vs4≠ 4vs3*
	WAZ	-5.87±2.72	-0.87±4.72	2.12±845	1.36±9.65	1.23±1.87	1.54±4.57	-2.58±2.33	-2.28±4.93		
	MUACZ	2.34±6.04	1.34±8.04	1.61±5.97	0.01±1.32	0.07±5.56	-1.22±8.06	2.14±7.16	1.30±9.92		
	HCZ	-2.52±2.06	-0.52±3.06	-0.22±7.17	-3.22±7.17	1.59±0.26	-1.5±9.66	1.00±7.55	-1.05±0.94		
	TSFZ	-2.48±4.36	-0.48±1.36	1.44±6.24	1.44±6.24	-0.35±3.51	-1.15±2.43	2.12±8.45	-1.36±9.65		
	SSFZ	1.35±7.32	0.35±8.32	-0.26±9.58	-2.26±9.58	1.24±1.59	-2.681.32	1.61±5.97	-1.01±1.31		
60	HAZ	-2.71±4.44	-1.71±6.44	1.62±4.88	1.62±4.88	-0.1±9.89	0.103.15	-0.22±7.17	-2.2±27.17	1vs2* 1vs3* 2vs3* 1vs4≠ 4vs3*	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠
	WAZ	2.41±3.66	0.41±6.66	-0.56±9.62	-3.56±9.62	1.3±9.01	1.62±8.64	1.44±6.24	1.44±6.24		
	MUACZ	-2.87±3.72	-0.87±4.72	1.68±7.38	1.68±7.38	-0.39±2.08	0.27±0.57	-0.26±9.58	-2.26±9.58		
	HCZ	2.34±2.04	2.34±8.04	-1.22±7.17	-3.22±7.17	1.23±1.87	1.54±4.57	-0.15±7.57	-1.20±9.19		
	TSFZ	-3.52±1.06	-0.52±3.06	1.44±6.24	1.44±6.24	0.07±5.56	0.22±8.06	1.58±4.96	1.11±3.47		
	SSFZ	-2.48±4.36	-0.48±1.36	-0.26±9.58	-3.26±9.58	-1.59±0.26	-1.5±9.66	0.58±2.33	-1.28±4.93		

Table 3.9. Changes in age and sex specific mean of WHO z-score variables of Control Group over four interval study periods

Age (months)	Variables	Phase I (319)		Phase II (240)		Phase III (230)		Phase IV (201)		Schieff's test	
		Boys (164)	Girls (155)	Boys (123)	Girls (117)	Boys (118)	Girls (112)	Boys (97)	Girls (104)		
12-23	HAZ	-1.98±1.77	-2.71±1.36	-3.06±1.57	-1.95±1.23	-2.74±1.79	-2.80±1.42	-2.63±1.31	1.46±1.13	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3# 1vs4* 4vs3≠
	WAZ	-3.99±1.43	-2.87±1.68	-3.75±1.85	-4.35±3.15	1.06±984	1.45±1.05	1.17±1.11	-1.27±1.04		
	MUACZ	-2.91±1.04	-2.94±1.44	-2.92±2.47	-1.81±2.47	-1.77±1.10	-1.34±1.01	-3.66±1.21	-2.44±1.14		
	HCZ	-1.51±1.25	-3.18±1.66	-1.90±1.56	-3.20±244	1.49±1.81	-4.93±1.08	1.67±1.10	2.70±1.03		
	TSFZ	-2.89±3.21	-3.10±2.72	-2.57±1.17	-1.46±1.17	-2.04±1.32	1.20±1.02	-1.06±1.02	1.16±1.07		
	SSFZ	-2.40±2.67	-2.11±1.04	-1.93±1.06	-3.20±1.24	1.41±1.28	-3.61±1.52	1.52±1.01	2.62±1.80		
24-35	HAZ	-2.86±1.67	-2.75±3.06	-2.61±1.58	-1.50±1.58	-2.01±1.30	-2.73±1.60	-1.89±1.21	-2.79±1.70	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3* 1vs4* 4vs3≠
	WAZ	-4.59±1.60	-3.10±1.28	-2.72±1.12	1.38±1.88	-1.01±1.31	-1.89±1.15	-2.90±1.31	-3.19±2.09		
	MUACZ	-2.66±1.01	-2.64±1.66	-2.91±1.62	-1.80±1.62	-2.93±0.41	-2.96±1.18	-2.82±1.41	-1.72±1.41		
	HCZ	-3.54±1.82	1.54±1.83	-1.66±262	1.44±1.38	-1.53±1.05	1.16±1.01	-1.42±1.05	2.67±1.55		
	TSFZ	-3.43±1.20	-3.33±1.21	-1.96±1.02	-1.85±1.01	-2.91±1.08	-3.12±1.17	-2.80±1.08	-1.70±1.08		
	SSFZ	-1.61±1.12	-3.05±3.69	1.31±1.43	2.42±1.43	-3.42±1.74	-2.09±1.42	-1.31±1.14	2.78±1.26		
36-47	HAZ	-4.50±1.74	-1.61±0.27	-1.54±1.96	-1.43±1.96	-2.88±1.67	-2.77±1.56	-2.77±1.07	-1.67±1667		
	WAZ	-2.67±1.24	-1.28±0.61	-3.46±1.82	1.57±1.82	-0.61±1.04	-1.12±1.02	-1.50±1.14	0.59±4396	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3*
	MUACZ	-2.50±1.57	-2.55±1.19	-3.06±1.57	-1.95±1.57	-2.68±1.01	-2.66±1.01	-2.57±1.02	-1.47±1.12		
	HCZ	-1.76±1.04	-1.23±1.53	-2.75±1.85	1.35±3.15	-1.56±1.24	2.52±1.27	-2.45±1.24	0.64±5176		
	TSFZ	-2.76±767	-2.06±1.07	-2.92±2.47	-1.81±2.47	-3.45±1.31	-3.35±1.14	-3.34±1.13	-2.24±1.11		
	SSFZ	-3.20±284	-1.04±1.08	-1.59±3.51	-1.39±2.43	-1.63±1.20	-3.07±1.13	-2.52±1.21	1.57±1.21		
48-59	HAZ	-4.34±2.45	-2.29±1.06	1.01±1.59	1.44±1.32	-1.52±1.14	-1.63±1.03	-1.41±4744	-2.31±1.23	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3*
	WAZ	-2.22±1.55	-1.98±1.36	-1.43±1.90	-1.13±1.85	-4.65±2.42	1.26±1.10	1.76±1.02	1.86±1.22		
	MUACZ	-2.73±1.03	-2.34±1.01	1.15±1.10	-3.38±1.64	-2.00±1.70	-2.73±1.20	-1.89±1.12	-2.79±1.31		
	HCZ	-1.06±3.33	-2.90±1.15	-1.63±2.08	-2.96±1.43	-1.01±1.31	-1.89±1.15	-1.90±1.31	2.19±1.24		
	TSFZ	-2.35±1.32	-2.13±1.18	-0.00±1..13	-2.30±1.57	-2.93±1.41	-2.96±1.38	-2.82±1.41	-1.72±1.41		
	SSFZ	-2.25±1.82	-1.84±1.13	-1.16±444	-1.01±1.94	-2.53±2.05	2.16±1.60	-1.42±1.05	2.67±1.51		
60	HAZ	-5.20±2.84	-1.04±1.08	1.35±026	-2.35±1.60	-2.91±1.08	-3.12±1.17	-2.80±1.08	-1.70±1.28	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2* 1vs3* 2vs3* 1vs4* 4vs3≠
	WAZ	-3.34±2.45	-2.29±1.06	-1.59±351	-1.39±1.03	-1.42±1.74	1.19±1.02	-1.31±1.04	0.78±1.06		
	MUACZ	-1.22±1.55	-1.98±1.36	-1.00±159	-2.44±1.32	-2.01±1.70	-2.73±1.36	-1.89±1.11	-3.79±1.70		
	HCZ	-1.73±1.03	-2.34±1.01	-1.43±890	-1.13±1.05	-1.01±1.31	-1.89±1.15	-1.90±1.31	2.19±1.12		
	TSFZ	-3.06±2.12	-3.90±1.45	1.15±1.10	1.38±1.14	-2.93±1.41	-2.96±1.38	-2.82±1.42	-1.72±1.21		
	SSFZ	-2.25±1.81	-2.13±1.98	-1.63±1.01	-2.96±1.43	-3.53±1.45	1.16±1.01	-1.42±1.15	2.67±1.51		

Table 3.10. Results of Schiffe's test with regards comparison of Case and Control Group over four interval study periods

Age in months	Case Group				Control Group			
	Boys	p-value	Girls	p-value	Boys	p-value	Girls	p-value
12-23	1vs2*	0.002	1vs2*	0.002	1vs2*	0.013	1vs2*	0.017
	1vs3 *	0.005	1vs3*	0.02	1vs3 *	0.005	1vs3*	0.012
	2vs3≠	0.11	2vs3*	0.013	2vs3≠	0.31	2vs3*	0.023
	1vs4*	0.021	1vs4*	0.007	1vs4*	0.021	1vs4*	0.016
	4vs3≠	0.101	4vs3*	0.008	4vs3≠	0.301	4vs3*	0.019
24-35	1vs2 *	0.00	1vs2*	0.014	1vs2 *	0.00	1vs2*	0.025
	1vs3 *	0.01	1vs3*	0.013	1vs3 *	0.031	1vs3*	0.014
	2vs3≠	0.134	2vs3≠	0.421	2vs3≠	0.234	2vs3≠	0.132
	1vs4≠	0.112	1vs4*	0.015	1vs4≠	0.312	1vs4*	0.003
	4vs3≠	0.235	4vs3≠	0.105	4vs3≠	0.115	4vs3≠	0.123
36-47	1vs2 *	0.00	1vs2*	0.004	1vs2 *	0.00	1vs2*	0.002
	1vs3 *	0.01	1vs3*	0.007	1vs3 *	0.03	1vs3*	0.006
	2vs3*	0.001	2vs3*	0.022	2vs3*	0.002	2vs3*	0.012
	1vs4*	0.004	1vs4*	0.016	1vs4*	0.003	1vs4*	0.006
	4vs3*	0.006	4vs3*	0.011	4vs3*	0.002	4vs3*	0.001
48-59	1vs2 *	0.012	1vs2*	0.023	1vs2 *	0.032	1vs2*	0.003
	1vs3 *	0.013	1vs3*	0.028	1vs3 *	0.015	1vs3*	0.008
	2vs3*	0.021	2vs3*	0.017	2vs3*	0.023	2vs3*	0.027
	1vs4≠	0.315	1vs4≠	0.106	1vs4≠	0.114	1vs4≠	0.306
	4vs3≠	0.105	4vs3±	0.124	4vs3≠	0.205	4vs3±	0.214
60	1vs2 *	0.014	1vs2*	0.018	1vs2 *	0.011	1vs2*	0.019
	1vs3 *	0.004	1vs3*	0.107	1vs3 *	0.002	1vs3*	0.005
	2vs3≠	0.407	2vs3*	0.03	2vs3≠	0.107	2vs3*	0.000
	1vs4*	0.022	1vs4*	0.019	1vs4*	0.022	1vs4*	0.000
	4vs3≠	0.116	4vs3*	0.108	4vs3≠	0.116	4vs3*	0.001

 # stat not sign at 5% level
***stat sign at 5% level**

Changes of anthropometric variables of Case and Control Group body composition measurement:

The mean and standard deviation of the body composition measurement of percent body fat (PBF), fat mass (FM), fat free mass (FFM), Fat mass index (FMI), and fat free mass index (FFMI) measurement of Case and Control Group was found in four Phases of present study. From Phase I to Phase IV are present in **Table 3.11**. the variables were gradually increases or decreases in age wise.

All the measurement from Phase I to Phase IV Using Schieff's test for Case Group and for Control Group in **Table 3.13**. Sex difference were observed between boys and girls in each phase. However differences in percent body fat (PBF), fat mass (FM), fat free mass (FFM), Fat mass index (FMI), and fat free mass index (FFMI) were statistically significant ($p<0.05$) in most cases. But in case of Control Group differences in percent body fat (PBF), fat mass (FM), fat free mass (FFM), Fat mass index (FMI), and fat free mass index (FFMI) in each cases.

Point differerece was found in each Cases of study. The overall result shows that statistical significant association among boys and girls with Scheffe's test. The association of changes in point difference adjacent in increase of age that was found in different Phases of Case and Control study (**Table 3.11**).

Table 3.11. Changes in age and gender specific mean of body composition variation of Case Group over four interval study periods.

Age (Years)	Variables	Phase I (315)		Phase II (308)		Phase III (297)		Phase IV (284)		Schieff's test	
		Boys (164)	Girls (151)	Boys (101)	Girls (207)	Boys (157)	Girls (141)	Boys (143)	Girls (141)		
12-23	PBF	6.98±1.45	6.08±3.48	5.10±3.58	8.20±4.69	6.11±3.68	4.30±2.80	9.15±4.79	7.34±1.91	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	1.41±1.23	1.51±1.44	2.53±1.54	2.63±2.65	3.54±1.64	2.73±1.76	3.58±2.75	2.77±1.87		
	FFM	4.43±1.57	5.53±3.02	11.55±3.12	11.65±4.23	12.56±3.22	11.75±3.34	12.60±4.33	11.79±1.45		
	FMI	1.54±1.60	1.64±1.41	2.66±1.51	2.76±2.62	3.67±1.61	2.86±1.73	3.71±2.72	2.90±1.84		
	FFMI	6.35±1.32	6.45±2.43	12.47±2.53	10.57±3.64	13.48±2.63	12.67±4.75	13.52±3.74	12.71±1.86		
24-35	PBF	8.98±2.37	7.99±2.48	13.11±3.58	8.12±3.69	14.13±5.68	13.13±3.80	14.15±1.79	13.15±1.91	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	1.41±1.33	1.42±0.44	2.54±1.54	2.55±1.65	3.56±1.64	2.56±1.76	3.58±1.75	2.58±1.87		
	FFM	7.43±1.91	7.44±2.02	11.56±3.12	11.57±3.23	12.58±5.22	11.58±3.34	12.60±1.33	11.60±1.45		
	FMI	1.54±1.30	1.55±0.41	2.67±1.51	2.68±1.62	3.69±1.61	2.69±1.73	3.71±1.72	2.71±1.04		
	FFMI	7.35±1.32	6.36±1.43	12.48±2.53	12.49±2.64	13.50±4.63	12.50±2.75	13.52±1.74	12.52±3.86		
36-47	PBF	9.98±2.37	11.99±4.48	13.21±3.58	10.22±5.69	14.33±5.68	13.23±1.80	14.35±1.79	13.26±1.91	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	1.41±3.33	1.42±2.44	2.64±1.54	2.65±3.65	3.76±1.64	2.66±1.76	3.78±1.75	2.68±1.87		
	FFM	8.43±1.91	10.44±4.02	11.66±3.12	9.67±5.23	12.78±5.22	11.68±1.34	12.80±1.33	11.71±1.45		
	FMI	1.54±1.30	1.55±1.01	2.77±1.51	2.78±1.62	3.89±1.61	2.79±1.73	3.91±1.72	2.81±1.84		
	FFMI	9.35±1.32	11.36±3.43	12.58±2.53	12.59±4.64	13.70±4.63	12.60±1.75	13.72±1.74	12.62±1.86		
48-59	PBF	10.98±2.37	11.99±4.58	13.21±3.78	11.22±5.99	14.36±1.08	13.23±1.20	14.39±1.99	13.26±2.31	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	1.41±2.33	1.42±2.54	2.64±1.74	2.65±1.95	3.79±1.84	2.66±1.16	3.81±1.95	2.69±1.27		
	FFM	9.43±1.91	10.44±4.12	11.66±3.32	11.67±5.53	12.81±3.42	11.68±1.74	12.84±1.53	11.71±1.85		
	FMI	1.54±0.30	1.55±2.51	2.77±1.71	2.78±1.92	3.92±1.81	2.79±1.13	3.94±1.92	2.82±1.24		
	FFMI	10.35±1.32	11.36±3.53	12.58±2.73	11.59±4.94	13.73±2.83	12.60±1.15	13.76±0.94	12.63±1.26		
60	PBF	11.98±2.37	13.24±7.78	13.26±4.39	10.68±1.88	13.28±1.03	14.70±1.59	13.30±1.71	15.70±7.59	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	1.41±2.12	2.67±5.74	2.69±2.35	4.10±1.84	2.70±1.96	4.13±1.55	2.73±1.67	5.13±1.55		
	FFM	10.43±1.91	11.69±7.32	11.71±3.93	11.13±1.42	11.73±1.54	13.15±1.13	11.75±1.25	14.15±1.13		
	FMI	1.54±3.47	2.80±5.71	2.82±2.32	4.23±1.81	2.83±1.03	4.26±1.52	2.86±1.64	5.26±1.52		
	FFMI	11.35±1.32	12.61±6.73	12.63±3.34	10.05±1.83	12.64±1.95	14.07±1.54	12.67±1.66	15.07±1.54		

Table 3.12. Changes in age and sex specific mean of body composition variation of Control Group over four interval study periods.

Age (Years)	Variables	Phase I (319)		Phase II (240)		Phase III (230)		Phase IV (201)		Schieff's test	
		Boys (164)	Girls (155)	Boys (123)	Girls (117)	Boys (118)	Girls (112)	Boys (97)	Girls (104)		
12-23	PBF	13.12±7.89	13.20±8.12	14.52±6.79	13.31±8.14	14.56±8.90	13.46±9.56	12.19±2.21	13.12±7.89	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	2.55±5.85	2.63±6.08	3.95±4.75	2.74±6.10	3.99±6.86	2.89±7.52	1.62±0.17	2.55±5.85		
	FFM	11.57±7.43	11.65±7.66	12.97±6.33	11.76±7.68	13.01±8.44	11.91±9.10	10.64±1.75	11.57±7.43		
	FMI	2.68±5.82	2.76±6.05	4.08±4.72	2.87±6.07	4.12±6.83	3.02±7.49	1.75±0.14	2.68±5.82		
	FFMI	12.49±6.84	12.57±7.07	13.89±5.74	12.68±7.09	13.93±7.85	12.83±8.51	11.56±1.16	12.49±6.84		
24-35	PBF	13.13±7.89	13.12±7.12	14.54±8.79	13.14±6.14	14.57±0.90	13.27±7.56	12.19±2.21	13.13±7.89	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	2.56±5.85	2.55±5.08	3.97±6.75	2.57±4.10	3.99±8.86	2.70±5.52	1.62±0.17	2.56±5.85		
	FFM	11.58±7.43	11.57±6.66	12.99±8.33	11.59±5.68	13.02±0.44	11.72±7.10	10.64±1.75	11.58±7.43		
	FMI	2.69±5.82	2.68±5.05	4.10±6.72	2.70±4.07	4.12±8.83	2.83±5.49	1.75±0.14	2.69±5.82		
	FFMI	12.50±6.84	12.49±6.07	13.91±7.74	12.51±5.09	13.93±9.85	12.64±6.51	11.56±1.16	12.50±684		
36-47	PBF	13.23±7.89	13.22±9.12	14.74±8.79	13.25±0.14	14.77±2.90	13.38±3.56	12.19±2.21	13.23±789	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FM	2.66±5.85	2.65±7.08	4.17±6.75	2.67±8.10	4.20±0.86	2.81±1.52	1.62±0.17	2.66±5.85		
	FFM	11.68±7.43	11.67±8.66	13.19±8.33	11.69±9.68	13.22±2.44	11.83±3.10	10.64±1.75	11.68±7.43		
	FMI	2.79±5.82	2.78±7.05	4.30±6.72	2.80±8.07	4.33±0.83	2.94±1.49	1.75±0.14	2.79±5.82		
	FFMI	12.60±6.84	12.59±8.07	14.11±7.74	12.61±9.09	14.14±1.85	12.75±2.51	11.56±1.16	12.60±6.84		
48-59	PBF	13.23±8.09	13.22±9.42	14.78±0.99	13.25±0.54	14.80±6.10	13.38±4.96	12.19±2.21	13.23±8.09	1vs2* 1vs3* 2vs3≠ 1vs4 4vs3 1vs2	1vs2 1vs3 2vs3 1vs4 4vs3 1vs2
	FM	2.66±6.05	2.65±7.38	4.20±8.95	2.67±8.50	4.23±4.06	2.81±2.92	1.62±0.17	2.66±6.05		
	FFM	11.68±7.63	11.67±8.96	13.23±0.53	11.70±0.08	13.25±5.64	11.83±4.50	10.64±1.75	11.68±7.63		
	FMI	2.79±6.02	2.78±7.35	4.33±8.92	2.80±8.47	4.36±4.03	2.94±2.89	1.75±0.14	2.79±6.02		
	FFMI	12.60±7.04	12.59±8.37	14.14±9.94	12.61±9.49	14.17±5.05	12.75±3.91	11.56±1.16	12.60±7.04		
60	PBF	13.28±8.70	14.68±5.31	13.69±4.11	14.72±0.93	13.72±1.82	15.83±0.24	12.19±2.21	13.28±8.70		
	FM	2.71±6.66	4.11±3.27	3.12±2.07	4.14±8.89	3.14±9.78	5.25±8.20	1.62±0.17	2.71±6.66	1vs2* 1vs3* 2vs3≠ 1vs4* 4vs3≠	1vs2 1vs3 2vs3 1vs4 4vs3
	FFM	11.73±8.24	13.13±4.85	12.14±3.65	13.17±0.47	12.17±1.36	14.27±9.78	10.64±1.75	11.73±8.24		
	FMI	2.84±6.63	4.24±3.24	3.25±2.04	4.27±8.86	3.27±9.75	5.38±8.17	1.75±0.14	2.84±6.63		
	FFMI	12.65±7.65	14.05±4.26	13.06±3.06	14.08±9.88	13.09±0.77	15.19±9.19	11.56±1.16	12.65±7.65		

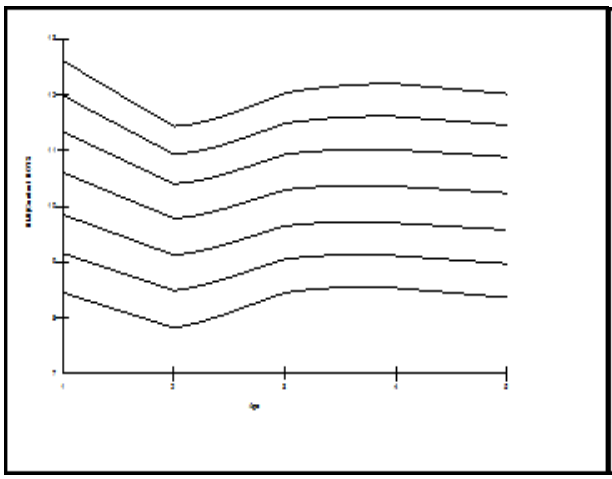
Table: 3.13. The comparison of Case and Control Group over four interval study periods

Age in months	Case Group				Control Group			
	Boys	p-value	Girls	p-value	Boys	p-value	Girls	p-value
12-23	1vs2*	0.002	1vs2*	0.002	1vs2*	0.013	1vs2*	0.017
	1vs3 *	0.005	1vs3*	0.02	1vs3 *	0.005	1vs3*	0.012
	2vs3≠	0.11	2vs3*	0.013	2vs3≠	0.31	2vs3*	0.023
	1vs4*	0.021	1vs4*	0.007	1vs4*	0.021	1vs4*	0.016
	4vs3≠	0.101	4vs3*	0.008	4vs3≠	0.301	4vs3*	0.019
24-35	1vs2 *	0.00	1vs2*	0.014	1vs2 *	0.00	1vs2*	0.025
	1vs3 *	0.01	1vs3*	0.013	1vs3 *	0.031	1vs3*	0.014
	2vs3≠	0.134	2vs3≠	0.421	2vs3≠	0.234	2vs3≠	0.132
	1vs4≠	0.112	1vs4*	0.015	1vs4≠	0.312	1vs4*	0.003
	4vs3≠	0.235	4vs3≠	0.105	4vs3≠	0.115	4vs3≠	0.123
36-47	1vs2 *	0.00	1vs2*	0.004	1vs2 *	0.00	1vs2*	0.002
	1vs3 *	0.01	1vs3*	0.007	1vs3 *	0.03	1vs3*	0.006
	2vs3*	0.001	2vs3*	0.022	2vs3*	0.002	2vs3*	0.012
	1vs4*	0.004	1vs4*	0.016	1vs4*	0.003	1vs4*	0.006
	4vs3*	0.006	4vs3*	0.011	4vs3*	0.002	4vs3*	0.001
48-59	1vs2 *	0.012	1vs2*	0.023	1vs2 *	0.032	1vs2*	0.003
	1vs3 *	0.013	1vs3*	0.028	1vs3 *	0.015	1vs3*	0.008
	2vs3*	0.021	2vs3*	0.017	2vs3*	0.023	2vs3*	0.027
	1vs4≠	0.315	1vs4≠	0.106	1vs4≠	0.114	1vs4≠	0.306
	4vs3≠	0.105	4vs3±	0.124	4vs3≠	0.205	4vs3±	0.214
60-71	1vs2 *	0.014	1vs2*	0.018	1vs2 *	0.011	1vs2*	0.019
	1vs3 *	0.004	1vs3*	0.107	1vs3 *	0.002	1vs3*	0.005
	2vs3≠	0.407	2vs3*	0.03	2vs3≠	0.107	2vs3*	0.000
	1vs4*	0.022	1vs4*	0.019	1vs4*	0.022	1vs4*	0.000
	4vs3≠	0.116	4vs3*	0.108	4vs3≠	0.116	4vs3*	0.001

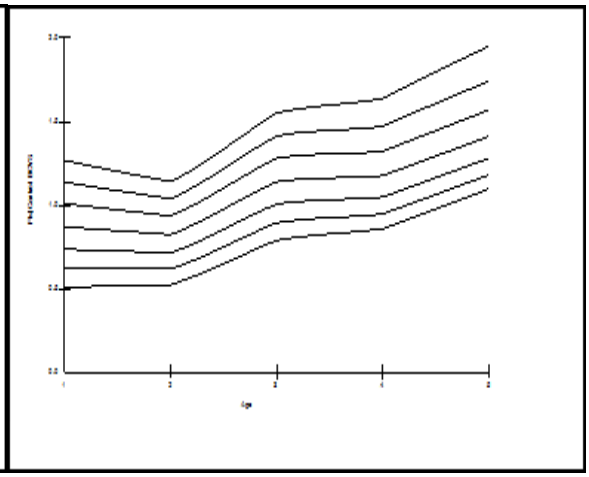
Figure 3.32 shows that the Fat Mass Fat free Mass: LMS among Case and Control Group of children

Boys Case Group

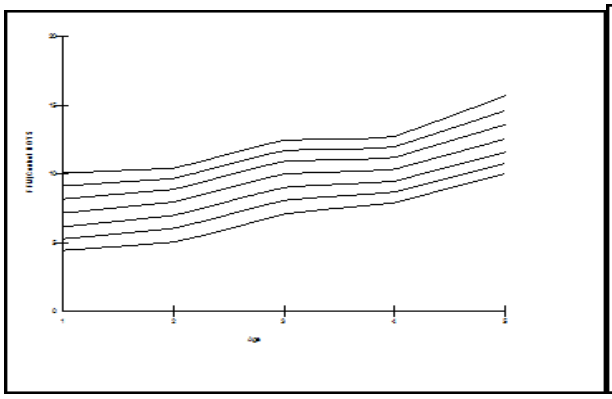
PBF (percent body fat)



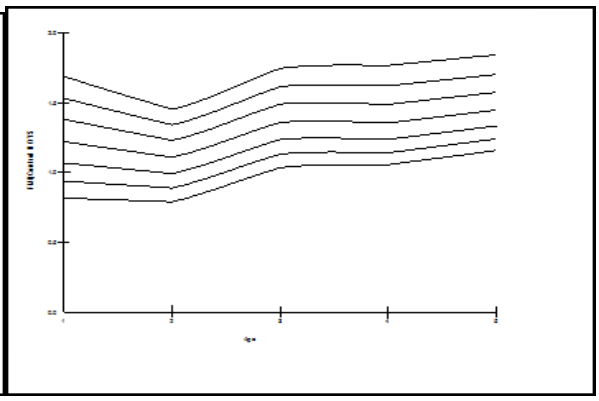
FM (Fat Mass)



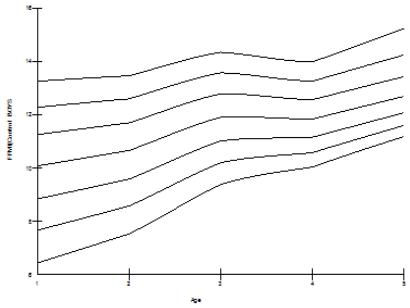
FFM (Fat Free Mass



FMI (Fat Mass Index)

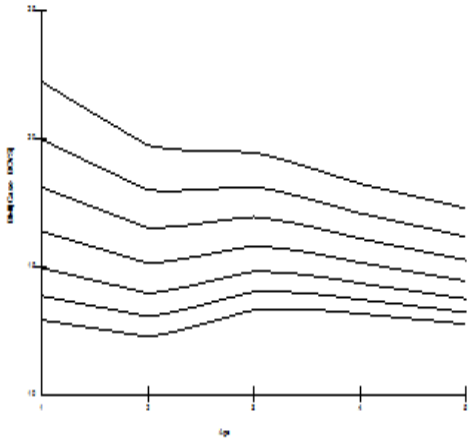


FFMI (Fat Free mass Index)

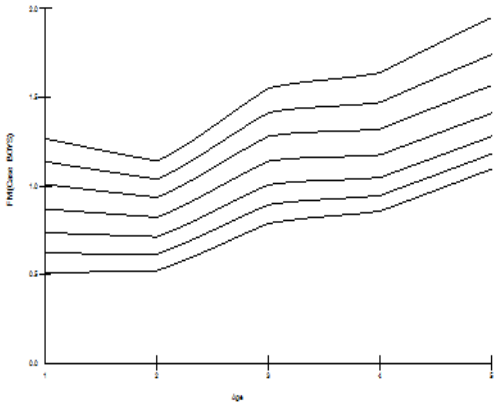


Boys Control Group

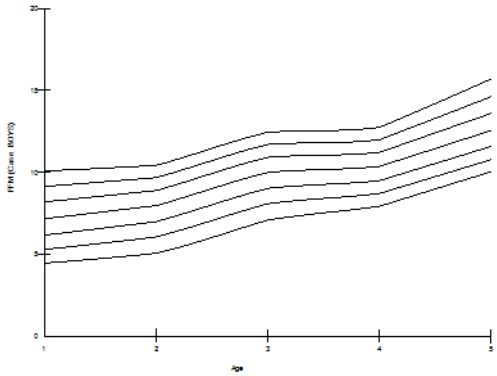
PBF (Percent body Fat)



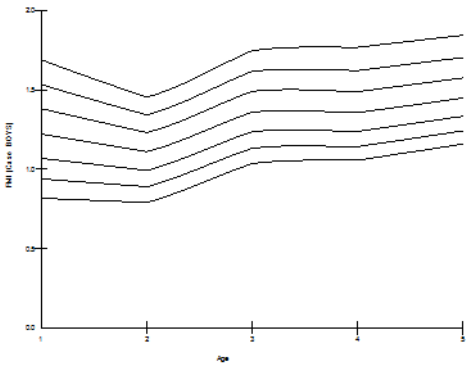
FM (Fat Mass)



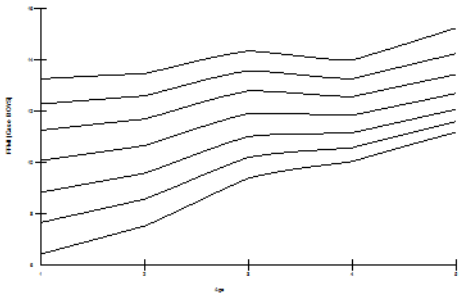
FFM (Fat Free Mass)



FMI (Fat Mass Index)



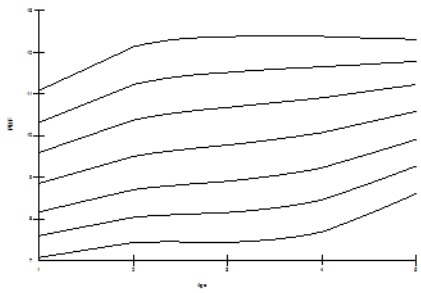
FFMI (Fat Free Mass Index)



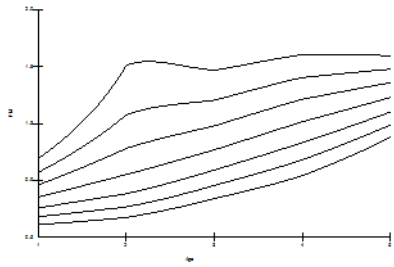
Girls Case Group:

PBF, FM, FFM, FMI, FFMI, BMI

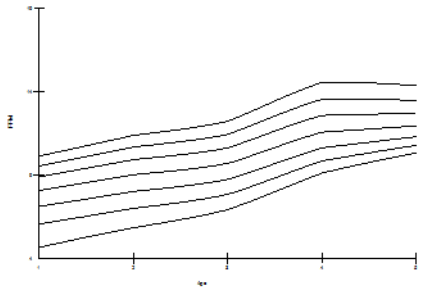
PBF (Percent Body Fat)



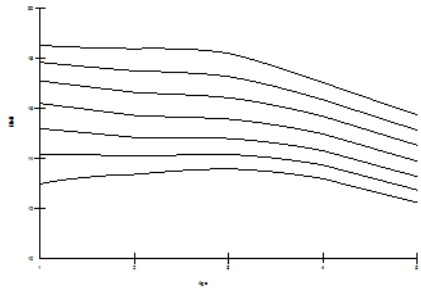
FM (Fat Mass)



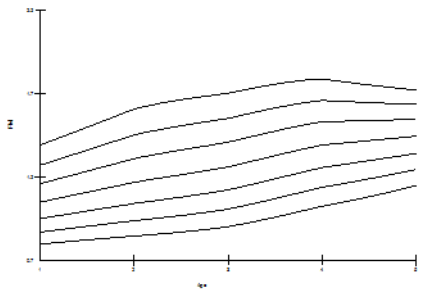
FFM (Fat Free Mass)



FMI (Fat Mass Index)

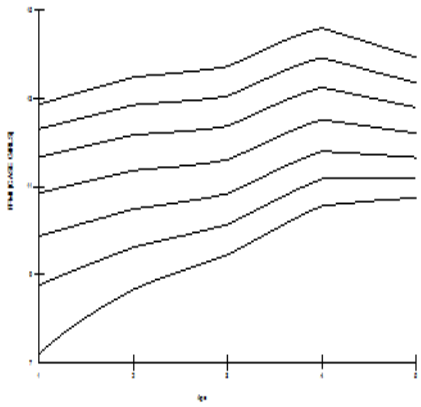


FFMI (Fat Free Mass Index)



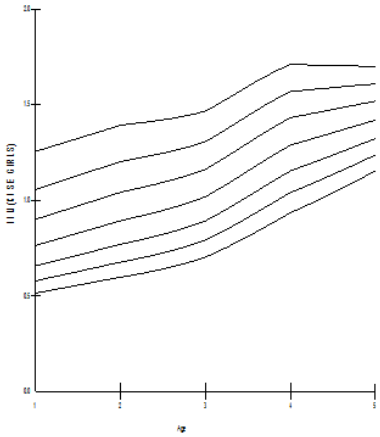
Boys Control data:

PBF (Percent Body Fat)

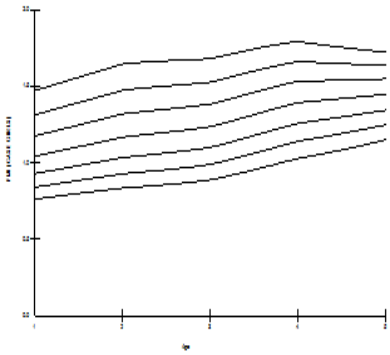


FM (Fat Mass)

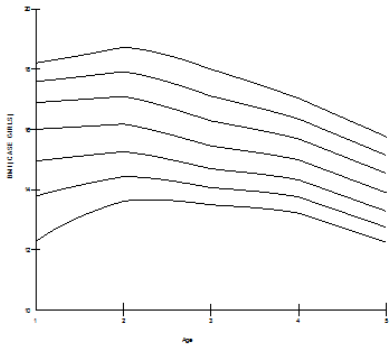
FFM (Fat Free Mass)



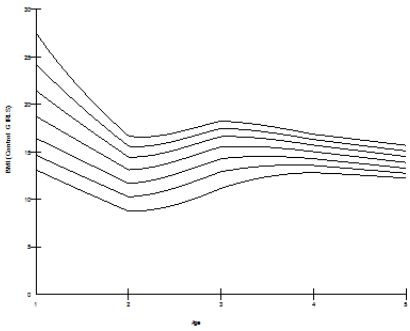
FMI (Fat Mass Index)



FFMI (Fat Free Mass Index)

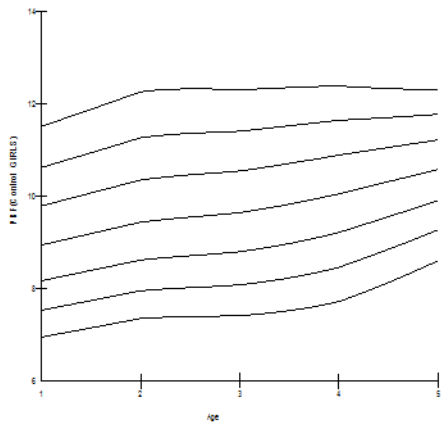


BMI (Body Mass Index)

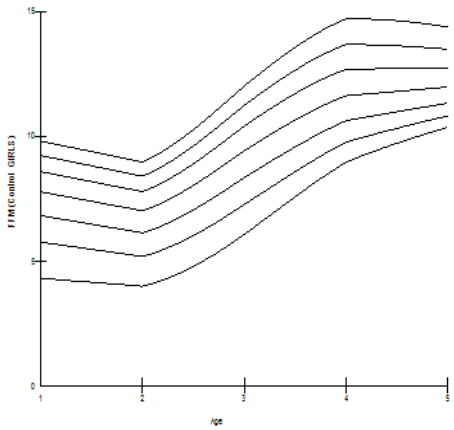


Girls Control data

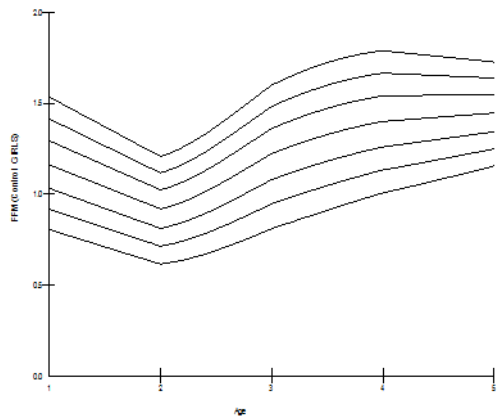
PBF (percent Body Fat)



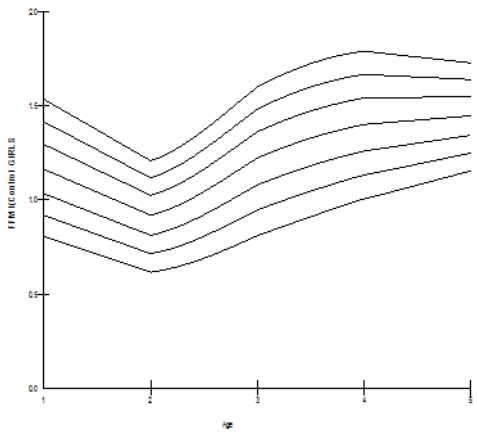
FM (Fat Mass)



FFM (Fat Free Mass)

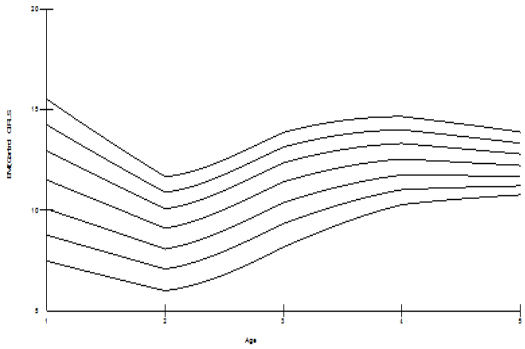


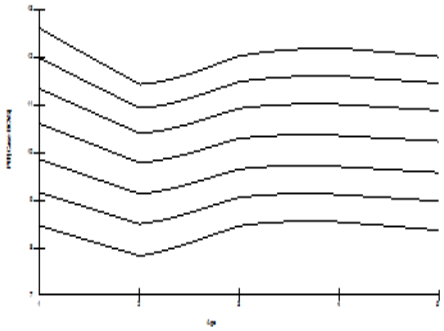
FMI (Fat Mass Index)



FFMI (Fat Free Mass Index)

BMI (Body Mass Index)





Prevalence of under nutrition (WAZ, HAZ and WHZ):

The age-specific prevalence of thinness was observed in **Table 3.14** of Case Group and Control Group in **Table 3.15.** The result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.14 and 3.15.** X^2 analysis shows in **Table 3.14** of Case Group and **Table 3.15** of Control Group shownthe statistically significant.

Table: 3.14. Prevalence of Stunting, under nutrition, and Wasting among Case Group of children:

Age Months	Variables	Phase I (315)				Phase II (308)				Phase III (297)				Phase IV (284)				X^2	
		Boys (164)		Girls (151)		Boys (101)		Girls (207)		Boys (157)		Girls (141)		Boys (143)		Girls (141)			
		Moderate	Severe	Moderate	Severe	Moderate	Severe	Moderate	Severe	Moderate	Severe	Moderate	Severe	Moderate	Severe	Moderate	Severe	***p***	**df**
12-23	Stunting (HAZ)	10 (6.10)	5 (3.05)	5 (3.31)	4 (2.65)	9 (8.91)	2 1.98	3 1.45	8 3.86	4 2.55	0 0.00	4 2.84	0 0.00	3 2.10	2 1.40	8 5.67	1 0.71	10.9	7
	Underweight (WAZ)	9 (5.49)	8 (4.88)	11 (7.28)	5 (3.31)	0 (0.00)	1 0.99	2 0.97	4 1.93	2 1.27	2 1.27	8 5.67	9 6.38	7 4.90	5 3.50	0 0.00	7 4.96	13.4*	7
	Wasting (WAZ)	9 (5.49)	8 (4.88)	2 (1.32)	4 (2.65)	4 (3.96)	9 8.91	1 0.48	7 3.38	4 2.55	7 2.00	1 0.71	4 2.84	0 0.00	8 5.59	5 3.55	0 0.00	22.5*	7
24-35	Stunting (HAZ)	2 (1.22)	9 (5.49)	6 (3.97)	7 (4.64)	5 (4.95)	0 0.00	6 2.90	0 0.00	1 0.64	2 1.27	9 6.38	7 4.96	4 2.80	0 0.00	2 1.42	1 0.71	13.9*	7
	Underweight (WAZ)	5 (3.05)	13 (7.93)	2 (1.32)	7 (4.64)	1 (0.99)	5 4.95	4 1.93	2 0.97	4 2.55	2 1.27	9 6.38	7 4.96	7 4.90	1 0.70	4 2.84	2 1.42	15.7*	7
	Wasting (WAZ)	4 (2.44)	0 (0.00)	6 (3.97)	4 (2.65)	5 (4.95)	4 3.96	5 2.42	4 1.93	3 1.91	2 1.27	4 2.84	4 2.84	5 3.50	4 2.80	5 3.55	4 2.84	5.21	7
36-46	Stunting (HAZ)	4 (2.44)	6 (3.66)	9 (5.96)	3 (1.99)	2 (1.98)	2 1.98	3 33.33	15 7.25	3 1.91	12 7.64	1 12.50	4 80.00	2 1.40	1 0.70	1 11.11	4 20.00	29.7*	7
	Underweight (WAZ)	3 (1.83)	3 (1.21)	4 (2.65)	6 (3.97)	4 3.96)	1 0.99	1 11.11	1 0.48	0 0.00	5 3.18	0 0.00	7 4.96	0 0.00	7 4.90	1 11.11	2 1.42	30.3*	7
	Wasting (WAZ)	0 (0.00)	5 3.05	7 (4.64)	5 (3.31)	0 0.00	3 2.97	8 3.86	6 2.90	6 3.82	14 8.92	8 5.67	16 11.35	8 5.59	16 11.19	0 0.00	6 4.26	27.3*	7
47-59	Stunting (HAZ)	3 (1.83)	3 (1.83)	0 (0.00)	7 (4.64)	2 1.98	1 0.99	9 4.35	0 0.00	1 0.64	2 1.27	8 5.67	7 4.96	2 1.40	1 0.70	9 6.38	15 10.64	12.12	7
	Underweight (WAZ)	4 (2.44)	2 (1.22)	6 (3.97)	3 (1.99)	6 5.94	6 5.94	3 1.45	15 7.25	3 1.91	12 7.64	1 0.71	4 2.84	2 1.40	1 0.70	1 0.71	4 2.84	14.19	7
	Wasting (WAZ)	6 (3.66)	5 (3.05)	4 (2.65)	0 (0.00)	2 1.98	1 0.99	1 0.48	1 0.48	7 4.46	5 3.18	0 0.00	7 4.96	0 0.00	7 4.90	1 0.71	2 1.42	5.32	7
60	Stunting (HAZ)	7 (4.27)	4 (2.44)	8 (5.30)	6 (3.97)	8 7.92	2 1.98	8 3.86	6 2.90	6 3.82	14 8.92	8 5.67	16 11.35	8 5.59	16 11.19	8 5.67	6 4.26	12.21	7
	Underweight (WAZ)	5 (3.05)	3 (1.83)	3 (1.99)	7 (4.64)	2 1.98	0 0.00	1 0.48	1 25.00	7 4.46	5 3.18	0 0.00	7 4.96	0 0.00	7 4.90	1 0.71	2 1.42	15.87	7
	Wasting (WAZ)	7 (4.27)	1 (0.61)	2 (1.32)	2 (1.32)	6 5.94	3 2.97	8 3.86	6 2.90	6 3.82	14 8.92	8 5.67	16 11.35	8 5.59	16 11.19	8 5.67	6 85.71	5.02	7
Total prevalence of all category of Under nutrition		78 (47.56)	75 (45.73)	75 (49.67)	70 (46.36)	56 55.45	40 39.60	63 30.43	76 36.71	57 36.31	98 62.42	69 48.94	115 81.56	56 39.16	92 64.34	54 38.30	62 43.97	32.23	7

Perthensis indicate percentage

Table 3.15. Prevalence of Stunting, under nutrition and Wasting among Control Group of children:

Age Months	Variables	Phase I (315)				Phase II (308)				Phase III (297)				Phase IV (284)				X^2	
		Boys (164)		Girls (151)		Boys (101)		Girls (207)		Boys (157)		Girls (141)		Boys (143)		Girls (141)			
		-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	p	d.f.
12-23	Stunting (HAZ)	8 (4.88)	4 (2.44)	6 3.87)	9 5.81)	2 1.63)	2 1.63)	2 1.71)	7 5.98)	4 3.39)	0 0.00	3 2.68	3 2.68	3 3.09	1 1.03	2 1.92	1 0.96	21.9	7
	Underweight (WAZ)	1 (0.61)	17 (10.37)	2 1.29)	2 1.29)	5 4.07)	1 0.81)	2 1.71)	3 2.56)	2 1.69)	2 1.69	8 7.14	3 2.68	3 3.09	5 5.15	0 0.00	4 3.85	23.4*	7
	Wasting (WAZ)	8 (4.88)	7 4.27)	1 0.65)	4 2.58)	4 3.25)	9 7.32)	1 0.85)	7 5.98)	4 3.39)	7 2.00	1 0.89	4 3.57	0 0.00	2 2.06	5 4.81	0 0.00	12.5*	7
24-35	Stunting (HAZ)	1 (0.61)	8 4.88)	9 5.81)	3 1.94)	5 4.07)	0 0.00)	0 0.00)	0 0.00)	1 0.85	2 1.69	0 0.00	0 0.00	4 4.12	0 0.00	0 0.00	1 0.96	23.9*	7
	Underweight (WAZ)	5 (3.05)	12 7.32)	9 5.81)	7 4.52)	1 0.81)	5 4.07)	2 1.71)	2 1.71)	2 1.69	2 1.69	9 8.04	7 6.25	7 7.22	1 1.03	2 1.92	2 1.92	25.7*	7
	Wasting (WAZ)	3 (1.83)	5 3.05)	9 5.81)	0 0.00)	5 4.07)	4 3.25)	2 1.71)	0 0.00)	3 2.54	0 0.00	2 1.79	4 3.57	5 5.15	4 4.12	5 4.81	2 1.92	15.21	7
36-46	Stunting (HAZ)	3 (1.83)	1 0.61)	4 2.58)	3 1.94)	0 0.00)	3 2.44)	2 1.71)	5 4.27)	3 2.54	2 1.69	1 0.89	4 3.57	2 2.06	1 1.03	0 0.00	4 3.85	19.7*	7
	Underweight (WAZ)	8 (4.88)	2 50.00)	5 3.23)	5 3.23)	4 3.25)	1 0.81)	1 0.85)	1 33.33)	3 2.54	5 4.24	0 0.00	7 6.25	0 0.00	3 3.09	1 0.96	2 1.92	10.3*	7
	Wasting (WAZ)	6 (3.66)	1 5.88)	5 3.23)	4 2.58)	8 6.50)	6 4.88)	8 6.84)	6 5.13)	6 5.08	0 0.00	2 1.79	6 5.36	4 4.12	6 6.19	0 0.00	6 5.77	27.3*	7
47-59	Stunting (HAZ)	3 (1.83)	1 14.29)	6 3.87)	3 1.94)	6 4.88)	4 3.25)	3 2.56)	5 4.27)	3 2.54	2 1.69	1 0.89	2 1.79	2 2.06	1 1.03	1 0.96	3 2.88	12.12	7
	Underweight (WAZ)	5 (3.05)	2 1.22)	5 3.23)	7 4.52)	3 2.44)	1 0.81)	1 0.85)	1 0.85)	7 5.93	5 4.24	0 0.00	5 4.46	0 0.00	2 2.06	1 0.96	2 1.92	14.19	7
	Wasting (WAZ)	6 3.66)	4 2.44)	8 5.16)	2 1.29)	8 6.50)	6 4.88)	8 6.84)	6 5.13)	6 5.08	4 3.39	3 2.68	6 5.36	7 7.22	5 5.15	4 3.85	5 4.81	5.32	7
60	Stunting (HAZ)	4 2.44)	2 11.76)	5 3.23)	7 4.52)	4 3.25)	1 0.81)	1 0.85)	0 0.00)	7 5.93	5 4.24	0 0.00	7 6.25	0 0.00	7 7.22	1 0.96	2 1.92	12.21	7
	Underweight (WAZ)	6 3.66)	4 23.53)	4 2.58)	6 3.87)	8 6.50)	6 4.88)	8 6.84)	6 5.13)	6 5.08	14 11.86	8 7.14	4 3.57	2 2.06	8 8.25	8 7.69	6 5.77	15.87	7
	Wasting (WAZ)	2 1.22)	2 1.22)	8 5.16)	3 1.94)	2 1.63)	1 0.81)	9 7.69)	0 0.00)	1 0.85	2 1.69	8 7.14	5 4.46	2 2.06	1 1.03	9 8.65	20 19.23	5.02	7
Total prevalence		69 42.07)	72 43.90)	86 55.48)	65 41.94)	65 52.85)	50 40.65)	50 42.74)	49 41.88)	58 49.15	52 44.07	46 (41.07)	67 (59.82)	41 (42.27)	47 (48.45)	39 (37.50)	60 (57.69)	21.11	7

Perthensis indicate percentage

Prevalence of head circumference based on z-score among children

The age-specific prevalence of head circumference is given in **Table 3.16** in Case Group of Phase I among Boys 2sd and 3sd (26.22), (36.59), in girls (46.36), (49.01), Phase II boys (49.50), (41.5) girls (29.95) (41.55) Phase III boys (41.40), (35.67) girls 39.01), 46.81Phase IV boys (27.27), (32.87) girls (31.21), (36.17). In Control Group (**Table 3.17**) Phase I Boys, 2sd and 3sd (45.12, 39.63) girls 2sd and 3sd (55.48, 39.35) Phase II, boys (58.54, 29.27), girls (35.9, 54.7) Phase III boys (59.32, 33.05) girls (33.93, 55.36) Phase IV boys (30.93, 41.24) girls (31.73, 30.77) respectively. The result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.16** for Case group and **Table 3.17** for Control Group**.**

Table: 3.16. Prevalence of under nutrition based on using head circumference among Case Group of children:

Age Months	Phase I (315)				Phase II (308)				Phase III (297)				Phase IV (284)					
	Boys (164)		Girls (151)		Boys (101)		Girls (207)		Boys (157)		Girls (141)		Boys (143)		Girls (141)		X^2	
	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	*P*	d.f.
12-23	12 (27.91)	22 (36.67)	18 (25.71)	29 (39.19)	15 (30.00)	10 (23.81)	24 (38.71)	51 (59.30)	36 (55.38)	10 (17.86)	15 (27.27)	10 (15.15)	11 (28.21)	9 (19.15)	9 (20.45)	12 (23.53	32.9	7
24-35	9 (20.93)	15 (25.00	10 (14.29)	11 (14.86)	9 (18.00)	9 (21.43)	8 (12.90)	7 (8.14)	5 (7.69)	9 (16.07)	10 (18.18)	11 (16.67)	4 (10.26)	8 (17.02)	7 (15.91)	1 (1.96)	33.4*	7
36-46	7 (16.28	14 (23.33	13 (18.57)	11 (14.86)	6 (12.00)	9 (21.43)	9 (14.52)	6 (6.98)	7 (10.77)	4 (7.14)	13 (23.64)	11 (16.67)	12 (30.77)	5 (10.64)	9 (20.45)	6 (11.76)	12.5*	7
47-59	7 (16.28	3 (5.00	13 (18.57)	10 (13.51)	10 (20.00)	7 (16.67)	4 (6.45)	16 (18.60)	10 (15.38)	17 (30.36)	1 (1.82)	11 (16.67)	2 (5.13)	8 (17.02)	2 (4.55)	6 (11.76)	13.9*	7
60	8 (18.60	6 (10.00	16 (22.86)	13 (17.57)	10 (20.00)	7 (16.67)	17 (27.42)	6 (6.98)	7 (10.77)	16 (28.57)	16 (29.09)	23 (34.85)	10 (25.64)	17 (36.17)	17 (38.64)	26 (50.98)	25.7*	7
Total prevalence	43 (26.22)	60 (36.59)	70 (46.36)	74 (49.01)	50 (49.50)	42 (41.5)	62 (29.95)	86 (41.55)	65 (41.40)	56 (35.67)	55 (39.01)	66 46.81	39 (27.27)	47 (32.87)	44 (31.21)	51 (36.17)	15.21	7

Perthensis indicate percentage

Table: 3.17. Prevalence of under nutrition based on using head circumference among Control Group of children:

Age Months	Phase I (315)				Phase II (308)				Phase III (297)				Phase IV (284)					
	Boys (164)		Girls (151)		Boys (101)		Girls (207)		Boys (157)		Girls (141)		Boys (143)		Girls (141)		X^2	
	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	*P*	d.f.
12-23	16 (37.21)	17 (28.33)	17 (24.29)	15 (20.27)	10 (20.00)	4 (9.52)	6 (9.68)	9 (10.47)	7 (10.77)	3 (5.36)	7 (12.73)	18 (27.27)	15 (38.46)	11 (23.40)	2 (4.55)	4 (7.84)	11.9	7
24-35	20 (20.70)	25 (34.69)	5 (5.65)	8 (10.56)	13 (16.50)	4 (4.00)	8 (17.67)	5 (5.56)	10 (12.57)	9 (12.13)	6 (14.16)	11 (15.29)	4 (4.00)	9 (15.00)	7 (11.06)	5 (15.63)	15.4*	7
36-46	4 (4.35)	14 (15.08)	15 (15.98)	11 (13.56)	12 (13.94)	7 (14.11)	8 (14.90)	18 (21.38)	6 (7.29)	9 (12.13)	6 (12.53)	11 (13.45)	6 (10.67)	5 (11.00)	9 (19.15)	6 (14.50)	12.5*	7
47-59	17 (22.97)	3 (4.62)	23 26.74)	10 (16.39)	17 (23.61)	7 (19.44)	11 (26.19)	23 (35.94)	10 (14.29)	7 (17.95)	11 (28.95)	11 (17.74)	1 (3.33)	8 (20.00)	2 (6.06)	6 (18.75)	23.9*	7
60	17 (22.97)	6 (9.23)	26 (30.23)	17 (27.87)	20 (27.78)	14 (38.89)	9 (21.43)	9 (14.06)	37 (52.86)	11 (28.21)	8 (21.05)	11 (17.74)	4 (13.33)	7 (17.50)	13 (39.39)	11 (34.38)	25.7*	7
Total	74 45.12)	65 (39.63)	86 (55.48)	61 (39.35)	72 (58.54)	36 29.27)	42 (35.9)	64 (54.7)	70 (59.32)	39 (33.05)	38 (33.93)	62 (55.36)	30 (30.93)	40 (41.24)	33 (31.73)	32 (30.77)	35.21	7

Perthensis indicate percentage

Prevalence of wasting based on mid upper arm circumference

The age-specific prevalence of MUAC based wasting was observed in **Table 3.18** in Case Group and Control Group (**Table 3.19**. Highest prevalence found among Phase II in Case Group of and in Phase I Control Group of boys and lowest in Phase IV. And among girls in Case Group of Phase IV and in Control Group of Phase IV. Lowest prevalence found in Phase II respectively. The result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.18 and 3.19**

Table: 3.18. Prevalence of under nutrition based on using mid upper arm circumference among Case Group of children:

Age Months	Phase I (315)				Phase II (308)				Phase III (297)				Phase IV (284)					
	Boys (164)		Girls (151)		Boys (101)		Girls (207)		Boys (157)		Girls (141)		Boys (143)		Girls (141)		X^2	
	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	- Moderate	- Severe	p	df
12-23	12 (7.32)	12 (7.32)	18 (11.92)	9 (5.96)	12 (11.88)	10 (9.9)	19 (9.18)	15 (7.25	13 (8.28)	15 (9.55	16 (11.35	12 (8.51	9 (6.29	18 (12.59	16 (11.35	10 (7.09	12.9	7
24-35	13 (7.93)	6 (3.66)	12 (7.95)	13 (8.61)	14 (13.86)	18 (17.82)	7 (3.38)	14 (6.76	15 (9.55)	14 (8.92	12 (8.51	10 (7.09	13 (9.09	12 (8.39	10 (7.09	13 (9.22	23.4*	7
36-47	10 (6.1)	12 (7.32)	15 (9.93)	12 (7.95)	18 (17.82)	5 (4.95)	8 (3.86)	13 (6.28	8 (5.1)	11 (2	10 (7.09	17 (12.06	12 (8.39	19 (13.29	19 (13.48	11 (7.8	12.5*	7
48-59	21 (12.8)	14 (8.54)	11 (7.28)	10 (6.62)	7 (6.93)	1 (0.99)	8 (3.86	26 (12.56)	9 (5.73	10 (6.37	13 (9.22	8 (5.67	18 (12.59	13 (9.09	13 (9.22	9 (6.38	23.9*	7
60	32 (19.51)	10 (6.1)	15 (9.93)	15 (9.93)	8 (7.92)	9 (8.91)	10 (4.83	13 (6.28)	6 (3.82	9 (5.73	8 (5.67	9 (6.38	4 (2.8	6 (4.2	12 (8.51	10 (7.09	25.7*	7
Total	88 (53.66)	54 (32.93)	71 (47.02)	59 (39.07)	59 (58.42)	43 (42.57)	52 (25.12	81 (39.13)	51 (32.48	59 (37.58	59 (41.84	56 (39.72	56 (39.16	68 (47.55	70 (49.65	53 (37.59	15.21	7

Perthensis indicate percentage

Prevalence of Thinness based on BMI

The age-specific prevalence of thinness was observed in **Table 3.20** of Case Group and Control Group in **Table 3.21**. The highest prevalence found among Phase III among boys and lowest in Phase II. And among girls in Phase I and lowest prevalence found in Phase II respectively. The result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.20,** and **3.21.**

Table: 3.19. Prevalence of under nutrition based on using mid upper arm circumference among Control Group of children:

Age Months	Phase I (319)				Phase II (240)				Phase III (230)				Phase IV (201)					
	Boys (164)		Girls (155)		Boys (123)		Girls (117)		Boys (118)		Girls (112)		Boys (97)		Girls (104)		X^2	
	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	-Moderate	-Severe	p	df
12-23	9 5.49	10 6.1	15 9.68	9 5.81	13 10.57	19 15.45	5 4.27	12 10.26	10 8.47	9 7.63	7 6.25	9 8.04	9 9.28	5 5.15	8 7.69	6 5.77	11.4*	7
24-35	13 7.93	6 3.66	12 7.74	13 8.39	14 11.38	18 14.63	7 5.98	6 5.13	15 12.71	14 11.86	12 10.71	10 8.93	5 5.15	12 12.37	9 8.65	9 8.65	23.5*	7
36-47	10 6.1	12 7.32	15 9.68	12 7.74	16 13.01	5 4.07	8 6.84	13 11.11	8 6.78	11 2	9 8.04	8 7.14	12 12.37	8 8.25	5 4.81	11 10.58	17.9*	7
48-59	21 12.8	14 8.54	10 6.45	6 3.87	7 5.69	1 0.81	8 6.84	8 6.84	9 7.63	12 10.17	13 11.61	8 7.14	18 18.56	5 5.15	13 12.5	9 8.65	25.7*	7
60	32 19.51	10 6.1	15 9.68	15 9.68	8 6.5	9 7.32	10 8.55	13 11.11	6 5.08	9 7.63	8 7.14	9 8.04	4 4.12	6 6.19	12 11.54	10 9.62	18.21	7
Total	85 51.83	52 31.71	67 43.23	55 35.48	58 47.15	52 42.28	38 32.48	52 44.44	48 40.68	55 46.61	49 43.75	44 39.29	48 49.48	36 37.11	47 45.19	45 43.27	19.7*	7

Perthensis indicate percentage, Moderate (moderate), and Severe (severe)

Table: 3.20. Prevalence of under nutrition based on using Thinness grade I, II, III among Case Group of children:

Age Months	Variables	Phase I (315)		Phase II (308)		Phase III (297)		Phase IV (284)		X^2	
		Boys (164)	Girls (151)	Boys (101)	Girls (207)	Boys (157)	Girls (141)	Boys (143)	Girls (141)		
12-23	Mild	9 5.49	16 10.6	9 8.91	4 1.93	4 2.55	8 5.67	4 2.8	2 1.42	10.9	3
	Moderate	8 4.88	12 7.95	10 9.9	2 0.97	21 13.38	8 5.67	7 4.9	0 0	13.4*	3
	Severe	8 4.88	1 0.66	4 3.96	1 0.48	4 2.55	1 0.71	0 0	5 3.55	22.5*	3
24-35	Mild	1 0.61	9 5.96	5 4.95	7 3.38	1 0.64	9 6.38	4 2.8	2 1.42	13.9*	3
	Moderate	4 2.44	9 5.96	1 0.99	4 1.93	4 2.55	9 6.38	7 4.9	4 2.84	15.7*	3
	Severe	3 1.83	4 2.65	5 4.95	5 2.42	3 1.91	4 2.84	5 3.5	5 3.55	5.21	3
36-46	Mild	3 3.53	8 5.3	6 5.94	3 7.89	3 6.25	1 2.04	2 1.4	1 2.13	29.7*	3
	Moderate	4 4.71	5 3.31	4 6.9	1 2.63	7 4.46	0 0	0 0	1 2.13	30.3*	3
	Severe	6 7.06	8 5.3	8 7.92	8 3.86	6 3.82	8 5.67	8 5.59	8 5.67	27.3*	3
47-59	Mild	2 2.35	8 5.3	2 3.45	9 4.35	1 2.08	8 5.67	2 1.4	9 6.38	12.12	3
	Moderate	3 1.83	8 5.3	6 5.94	3 1.45	3 1.91	1 0.71	2 1.4	1 0.71	14.19	3
	Severe	4 2.44	5 3.31	4 3.96	1 0.48	7 4.46	0 0	0 0	1 0.71	5.32	3
60	Mild	6 3.66	8 5.3	8 7.92	8 3.86	6 3.82	8 5.67	8 5.59	8 5.67	12.21	3
	Moderate	4 2.44	2 1.32	2 1.98	1 0.48	7 4.46	0 0	0 0	1 0.71	15.87	3
	Severe	6 3.66	2 1.32	6 5.94	8 3.86	6 3.82	8 5.67	8 5.59	8 5.67	5.02	3
Total prevalence		71 43.29	105 69.54	80 79.21	65 31.40	84 40.53	73 51.77	57 39.86	56 39.72	31.21	3

Perthensis indicate percentage

Table: 3.21. Prevalence of under nutrition based on using Thinness grade I, II, and III among Control Group of children:

Age Months	Variables	Phase I (315)		Phase II (308)		Phase III (297)		Phase IV (284)			
		Boys (164)	Girls (151)	Boys (101)	Girls (207)	Boys (157)	Girls (141)	Boys (143)	Girls (141)	X^2	
12-23	Mild	8 (4.88)	6 (10.32)	6 3.87	4 3.42	0 0	1 0.89	2 2.06	2 1.92	10.9	3
	Moderate	10 (6.1)	12 (7.74)	1 0.81	16 13.68	2 1.69	9 8.04	5 5.15	7 6.73	13.4*	3
	Severe	8 (4.88)	1 (0.65)	9 7.32	7 5.98	7 2	4 3.57	2 2.06	0 0	22.5*	3
24-35	Mild	1 (0.61)	9 (5.81)	0 0	0 0	2 1.69	7 6.25	0 0	1 0.96	13.9*	3
	Moderate	8 (4.88)	9 5.81	5 4.07	2 1.71	2 1.69	7 6.25	1 1.03	2 1.92	15.7*	3
	Severe	3 1.83	14 2.58	4 3.25	4 3.42	2 1.69	4 3.57	4 4.12	4 3.85	5.21	3
36-46	Mild	3 1.83	8 50	6 4.88	5 4.27	2 1.69	4 3.57	1 1.03	4 3.85	29.7*	3
	Moderate	8 4.88	5 41.67	1 0.81	1 6.25	5 4.24	7 6.25	7 7.22	2 1.92	30.3*	3
	Severe	6 3.66	8 5.16	6 4.88	6 5.13	14 11.86	6 5.36	6 6.19	6 5.77	27.3*	3
47-59	Mild	3 1.83	8 5.16	6 4.88	5 4.27	12 10.17	2 1.79	1 1.03	4 3.85	12.12	3
	Moderate	5 3.05	5 3.23	1 0.81	1 0.85	5 4.24	7 6.25	6 6.19	2 1.92	14.19	3
	Severe	6 3.66	8 5.16	6 4.88	6 5.13	4 3.39	6 5.36	5 5.15	6 5.77	5.32	3
60-	Mild	4 2.44	5 3.23	1 0.81	0 0	5 4.24	7 6.25	7 7.22	2 1.92	12.21	3
	Moderate	6 3.66	8 5.16	6 4.88	6 5.13	14 11.86	4 3.57	16 16.49	6 5.77	15.87	3
	Severe	2 1.22	8 5.16	1 0.81	0 0	2 1.69	5 4.46	1 1.03	20 19.23	5.02	3
Total prevalence		82 50	114 73.55	59 47.97	63 53.85	78 66.1	80 71.43	64 65.98	68 65.38	34.11	3

Perthensis indicate percentage

The Composite Index of Anthropometric failure

CIAF in Case Group

The analysis of under nutrition using the conventional indices showed that the overall prevalence was 1.4% (wasting), 3.5% (stunting) and 4.0% (under-weight). Compared to conventional anthropometric indices, the CIAF, which aggregated children from both single and multiple failures, showed the overall prevalence of under nutrition to be in Case Phase I, Phase II, Phase III and Phase IV presented in **Table 3.22**.

The age and sex specific disaggregation of the children into different CIAF indices is also shown in **Table 3.22**

CIAF in Control Group

The analysis of under nutrition using the conventional indices showed that the overall prevalence was 17.4% (wasting), 38.5% (stunting) and 47.0% (under-weight). Compared to conventional anthropometric indices, the CIAF, which aggregated children from both single and multiple failures, showed the highest overall prevalence of under nutrition to be 57.6% (Table 2). The prevalence of the CIAF was observed to be higher among boys (60.4%) than girls (54.8%). The differences were, however, not statistically significant when tested by chi-square analysis. Observing the conventional indices of stunting, wasting and under-weight, also suggested that boys were more affected than girls. The age and sex distribution, mean and standard deviation of height and weight, the prevalence of under nutrition among children using the conventional indices, and the CIAF are shown in **Table 3.23.**

The children belonging to the higher age Groups were found to be more affected by stunting and underweight.

In age and gender specific different variables of CIAF. And the result shows that among boys and girls were gradually increases in each Phase represented in **Table 3.22,** and **3.23.**

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Table 3.22:.The composite index of anthropometric failure among children belongs to Case Group over four interval study periods:

Age (Years)	Variables	Phase I (315)		Phase II (308)		Phase III (297))		Phase IV (284))	
		Boys (164)	Girls (151)	Boys (101)	Girls (207)	Boys(157)	Girls (141)	Boys (143)	Girls (141)
12-23	A (no failure)	4(2.99)	4(2.99)	2(2.15)	1(1.03)	2(1.87)	1(1.03)	3(3.23)	5(5.95)
	B (Wasting)	0(0.00)	2(1.49)	0(0.00)	3(3.09)	0(0.00)	1(1.03)	0(0.00)	22.38)
	C (Wasting & Under-weight)	7(3.23)	6(4.48)	6(6.45)	5(5.15)	2(1.87)	3(3.09)	1(1.08)	0(0.00)
	D (Wasting+ Under-weight + Stunting)	6(2.76)	4(2.99)	1(1.08)	1(1.03)	3(2.80)	3(3.09)	0(0.00)	2(2.38)
	E (Stunting + Under-weight)	19(8.76)	6(4.48)	0(0.00)	3(3.09)	2(1.87)	1(1.03)	0(0.00)	3(3.57)
	F (Stunting only)	1(0.46)	2(1.49)	3(3.23)	0(0.00)	2(1.87)	1(1.03)	1(1.08)	2(2.38)
	Y (Underweight)	6(2.76)	3(1.49)	0(0.00)	3(3.09)	0(0.00)	3(3.09)	2(2.15)	2(2.38)
24-35	A (no failure)	18(8.29)	13(1.49)	8(8.60)	5(5.15)	5(4.67)	1(1.03)	1(1.08)	2(2.38)
	B (Wasting)	3(1.38)	0(0.00)	6(6.45)	3(3.09)	2(1.87)	1(1.03)	7(7.53)	4(4.76)
	C (Wasting & Under-weight)	5(2.30)	2(1.49)	1(1.08)	1(1.03)	4(3.74)	1(1.03)	1(1.08)	2(2.38)
	D(Wasting+ Under-weight+ Stunting)	9(4.15)	6(4.48)	0(0.00)	3(3.09)	1(0.93)	7(7.22)	1(1.08)	2(2.38)
	E (Stunting +Under-weight)	12(5.53)	0(0.00)	7(7.53)	5(5.15)	2(1.87)	1(1.03)	2(2.15)	0(0.00)
	F (Stunting only)	3(1.38)	1(0.75)	0(0.00)	2(2.06)	7(6.54)	5(5.15)	6(6.45)	5(5.95)
	Y (Underweight)	8(3.69)	6(4.48)	4(4.30)	2(2.06)	0(0.00)	2(2.06)	5(5.38)	3(3.57)
36-47	A (no failure)	5(2.30)	2(1.49)	1(1.08)	2(2.06)	2(1.87)	1(1.03)	6(6.45)	4(4.76)
	B (Wasting)	4(1.84)	2(1.49)	0(0.00)	2(2.06)	5(4.67)	3(3.09)	4(4.30)	2(2.38)
	C (Wasting & Under-weight)	8(3.69)	6(4.48)	4(4.30)	2(2.06)	10(9.35)	8(8.25)	1(1.08)	1(1.19)
	D(Wasting +Under-weight + Stunting)	6(2.76)	4(2.99)	2(2.15)	1(1.03)	5(4.67)	3(3.09)	2(2.15)	0(0.00)
	E (Stunting +Under-weight)	13(5.99)	4(2.99)	2(2.15)	3(3.09)	2(1.87)	1(1.03)	1(1.08)	6(7.14)
	F (Stunting only)	1(0.46)	1(0.75)	1(1.08)	1(1.03)	8(7.48)	8(8.25)	1(1.08)	1(1.19)
	Y (Underweight)	4(1.84)	2(1.49)	5(5.38)	3(3.09)	0(0.00)	2(2.06)	9(9.68)	7(8.33)
48-59	A (no failure)	7(3.23)	2(1.49)	1(1.08)	1(1.03)	3(2.80)	1(1.03)	9(9.68)	7(8.33)
	B (Wasting)	0(0.00)	1(0.75)	3(3.23)	2(2.06)	0(0.00)	1(1.03)	1(1.08)	1(1.19)
	C (Wasting & Under-weight)	9(4.15)	8(5.97)	8(8.60)	7(7.22)	7(6.54)	5(5.15)	2(2.15)	1(1.19)
	D(Wasting+ Under-weight+ Stunting)	9(4.15)	8(5.97)	1(1.08)	9(9.28)	8(7.48)	7(7.22)	4(4.30)	3(3.57)
	E (Stunting +Under-weight)	10(4.61)	9(6.72)	1(1.08)	1(1.03)	1(0.93)	1(1.03)	1(1.08)	2(2.38)
	F (Stunting only)	4(1.84)	3(6.72)	4(4.30)	3(3.09)	5(4.67)	4(4.12)	0(0.00)	1(1.19)
	Y (Underweight)	6(2.76)	5(3.73)	3(3.23)	7(7.22)	0(0.00)	1(1.03)	5(5.38)	1(1.19)
60	A (no failure)	14(6.45)	11(3.73)	1(1.08)	1(1.03)	2(1.87)	2(2.06)	1(1.08)	2(2.38)
	B (Wasting)	1(0.46)	0(0.00)	3(3.23)	2(2.06)	1(0.93)	0(0.00)	1(1.08)	1(1.19)
	C (Wasting & Under-weight)	0(0.00)	1(0.75)	3(3.23)	2(2.06)	4(3.74)	3(3.09)	4(4.30)	3(3.57)
	D(Wasting+ Under-weight+ Stunting)	6(2.76)	4(2.99)	0(0.00)	7(7.22)	1(0.93)	9(9.28)	5(5.38)	2(2.38)
	E (Stunting +Under-weight)	4(1.84)	3(2.24)	2(2.15)	1(1.03)	3(2.80)	3(3.09)	1(1.08)	2(2.38)
	F (Stunting only)	3(1.38)	2(1.49)	7(7.53)	1(1.03)	4(3.74)	0(0.00)	1(1.08)	0(0.00)
	Y (Underweight)	2(0.92)	1(0.75)	3(3.23)	2(2.06)	4(3.74)	3(3.09)	4(4.30)	3(3.57)
	Total	117(52.80)	124(32.60)	93(32.52)	97(33.57)	107(42.46)	97(36.51)	93(46.50)	84(42.00)

Table 3.23. Changes in age and sex specific different variables of CIAF (Composite index of Anthropometric failure) among children belongs to Control Group over four interval study periods.

Age (Years)	Variables	Phase I (319)		Phase II (240)		Phase III (230)		Phase IV (201)	
		Boys (164)	Girls (155)	Boys (123)	Girls (117)	Boys (118)	Girls (112)	Boys (97)	Girls (104)
12-23	A (no failure)	7 (2.49)	6 (2.58)	2 (1.79)	1(1.02)	5(4.39)	4(3.42)	2 (2.15)	1(1.12)
	B (Wasting)	0 (0)	2 (0.86)	6 (5.36)	4(4.08)	0(0)	2(1.71)	0 (0.00)	2(2.25)
	C (Wasting & Under-weight)	7 (2.49)	6 (2.58)	6 (5.36)	5(5.10)	4(3.51)	3(2.56)	1 (1.08)	0(0.00)
	D (Wasting+ Under-weight + Stunting)	6 (2.14)	4 (1.72)	1 (0.89)	1(1.02)	5(4.39)	3(2.56)	0 (0.00)	2(2.25)
	E (Stunting +Under-weight)	19 (6.76)	16 (6.87)	0 (0)	3(3.06)	2(1.75)	1(0.85)	0 (0.00)	3(3.37)
	F (Stunting only)	1(0.36)	2 (0.86)	3 (2.68)	0 (0)	2(1.75)	1(0.85)	1 (1.08)	2(2.25)
	Y (Underweight)	6 (2.14)	3 (1.29)	0(0)	3(3.06)	0(0)	3(2.56)	2(2.15)	2(2.25)
24-35	A (no failure)	18 (6.41)	15 (6.44)	8(7.14)	5(5.10)	5(4.39)	1(0.85)	1(1.08)	2(2.25)
	B (Wasting)	3 (1.07)	0 (0)	6(5.36)	3 (3.06)	2(1.75)	1(0.85)	7(7.53)	4(4.49)
	C (Wasting & Under-weight)	5 (1.78)	2 (0.86)	1(0.89)	1(1.02)	4(3.51)	1(0.85)	1(1.08)	9(10.11)
	D (Was+ Under-weight+ Stunting)	9 (3.2)	6 (2.58)	0(0)	3(3.06)	1(0.88)	7(5.98)	1(1.08)	2(2.25)
	E (Stunting +Under-weight)	12 (4.27)	10 (4.29)	7(6.25)	5(5.10)	2(1.75)	1(0.85)	2(2.15)	0(0.00)
	F (Stunting only)	3 (1.07)	1 (0.43)	0(0)	2(2.04)	7(6.14)	5(4.27)	7(7.53)	5(5.62)
	Y (Underweight)	8 (2.85)	6 (2.58)	4(3.57)	2(2.04)	0(0)	2(1.71)	5(5.38)	3(3.37)
36-46	A (no failure)	25 (8.9)	23 (9.87)	1(0.89)	2(2.04)	2(1.75)	1(0.85)	6(6.45)	4(4.49)
	B (Wasting)	4 (1.42)	2 (0.86)	0(0)	2(2.04)	5(4.39)	3(2.56)	4(4.30)	2(2.25)
	C (Wasting & Under-weight)	8 (2.85)	6 (2.58)	4(3.57)	2(2.04)	10(8.77)	8(6.84)	1(1.08)	1(2.25)
	D (Wasting+ Under-weight + Stunting)	6 (2.14)	4(1.72)	2(1.79)	1(1.02)	5(4.39)	3(2.56)	2(2.15)	0(0.00)
	E (Stunting +Under-weight)	16 (5.69)	14 (6.01)	2(1.79)	3(3.06)	2(1.75)	1(0.85)	1(1.08)	6(6.74)
	F (Stunting only)	1 (0.36)	1 (0.43)	1(0.89)	1(1.02)	8(7.02)	8(6.84)	1(1.08)	1(1.12)
	Y (Underweight)	4 (1.42)	2 (0.86)	5(4.46)	3(3.06)	0(0)	2(1.71)	9(9.68)	7(7.87)
48-56	A (no failure)	14 (4.98)	12 (5.15)	1(0.89)	1(1.02)	3(2.36)	1(0.85)	9(9.68)	7(7.87)
	B (Wasting)	0 (0)	1 (0.43)	3(2.68)	2(2.04)	0(0)	1(0.85)	1(1.08)	1(1.12)
	C (Wasting & Under-weight)	9 (3.2)	8 (3.43)	8(7.14)	7(7.14)	7(6.14)	6(5.13)	2(2.15)	1(1.12)
	D (Wasting+ Under-weight + Stunting)	9(3.2)	8 (3.43)	1(0.89)	9(9.18)	8(7.02)	7(5.98)	4(4.30)	3(3.37)
	E (Stunting +Under-weight)	20(7.12)	19 (8.15)	1(0.89)	1(1.02)	1(0.88)	1(0.85)	1(1.08)	2(2.25)
	F (Stunting only)	4 (1.42)	3 (1.29)	4(3.57)	3(3.06)	5(4.39)	4(3.42)	0(0.00)	1(1.12)
	Y (Underweight)	6 (2.14)	5 (2.15)	8(7.14)	7(7.14)	0(0)	1(0.85)	5(5.38)	1(1.12)
60	A (no failure)	29 (10.32)	28 (12.02)	1(0.89)	1(1.02)	2(1.75)	2(1.71)	1(1.08)	2(2.25)
	B (Wasting)	1 (0.36)	0 (0)	3(2.68)	2(2.04)	1(0.88)	0(0.00)	1(1.08)	1(1.12)
	C (Wasting & Under-weight)	0 (0)	1 (0.43)	3(2.68)	2(2.04)	4(3.51)	3(2.56)	4(4.30)	3(3.37)
	D (Wasting+ Under-weight + Stunting)	12 (4.27)	11 (4.72)	8(7.14)	7(7.14)	1(0.88)	9(7.69)	5(5.38)	4(4.49)
	E (Stunting +Under-weight)	4 (1.42)	3 (1.29)	2(1.79)	1(1.02)	3(2.36)	15(12.82)	1(1.08)	2(2.25)
	F (Stunting only)	3 (1.07)	2 (0.86)	7(6.25)	1(1.02)	4(3.51)	3(2.56)	1(1.08)	0(0.00)
	Y (Underweight)	2 (0.71)	1 (0.43)	3(2.68)	2(2.04)	4(3.51)	3(2.56)	4(4.30)	3(3.37)
		131(49.21)	122(40.81)	112(34.89)	98(30.52)	114(43.51)	117(44.66)	93(37.20)	89(35.60)

The effect of Socio-economic, Demographic and life style related factors on under Nutrition, Thinness, MUAC

Table 3.24 to 3.47 shows the effect of Socio-economic, Demographic and life style related factors on under nutrition, Thinness, MUAC in ICDS (Integrated child development scheme) among the children.case group and Control Group of Overall creoss sectional data.

And From **Table 3.48** and **Table 3.49** is pure longitudinal data of the present study.

Effect of socio-economic, demographic and life style factors on prevalence of thinness

Case Group result based on Thinness:

The overall result of thinness was represented in **Table 3.39.** In Case Group of Phase I The results of the multinomial logistic regression model fitted to estimate the odds of being mild, moderate, severe and combined overall prevalence of thinness categories with socioeconomic, socio-demographic and lifestyle variables are depicted in **Table 3.32** . denotes Case Phase I, Girls were observed to exhibit significantly 1.50 times, 1.64 times, 2.30 times and 1.72 times greater odds than boys in mild, moderate, and severe categories of thinness ($p<0.01$). But the different result shows among girls in **Table 3.33** (Case Phase II), were observed 1.43 times, 1.54 times, 2.10 times, 1.65 times, in Table **3.34** (Case Phase III), were observed 1.34 times, 1.42 times, 2.00 times, 1.52 times, in Table **3.35** (Case Phase IV), were observed 1.32 times, 1.46 times, 1.94 times, 1.47 times respectively. And among boys were 1.62 times, 1.53 times and 1.48 times respectively. In **Table 3.32** (Case Phase I) the odds were higher among children belonging to higher age Groups of 5 years found to have 1.38 times significantly greater odds in prevalence of thinness in severe category ($p<0.05$). But 1.30 times in **Table 3.33** (Case Phase II), 1.27 times in **Table 3.34** (Case Phase II) and 1.40 times found in **Table 3.35** (Case Phase IV) respectively. The results also showed in

Table 3.32 (Case Phase I) that children belonging to the 'manual worker' father occupation category exhibited 1.66 times, 2.06 times and 1.60 times significant greater odds for being affected by mild, moderate and severe thinness prevalence categories, respectively ($p<0.01$). But in **Table 3.33** (Case Phase II) result exhibited 1.63 times, 2.03 times and 1.56 times significant, In **Table 3.34** (Case Phase III) result exhibited 1.32 times, 1.03 times and 1.46 times insignificant, In **Table 3.35** (Case Phase IV) 1.49 times, 1.85 times and 1.36 times respectively significant. The odds were also observed in **Table 3.32** (Case Phase I) to be significant higher ($p<0.05$) among those children residing households with no toilet facility (mild thinness: 1.48; moderate thinness: 1.68; severe thinness: 1.44) ($p<0.05$). But in **Table 3.33** (Case Phase II) shows the different result that household with no toilet facility (mild thinness: 1.43; moderate thinness: 1.62; severe thinness: 1.40). In Table 3.34 (Case Phase III) shows the result were (mild thinness: 1.34; moderate thinness: 1.53; severe thinness: 1.38). In **Table 3.35** (Case Phase IV) shows the result were (mild thinness: 1.29; moderate thinness: 1.45; severe thinness: 1.25) respectively. A significantly lower risk of severe thinness (grade-III) and mild thinness were observed in Case of children belonging to better maternal education (e.g., literate and above) (odds 0.63; $p<0.01$ and 0.73; $p<0.05$) and regular media exposure (odds 0.70; $p<0.05$) in **Table 3.32** (Case Phase I). But In Table 2 (Case Phase II), the odds were exhibited 0.56 and 0.71, In **Table 3.33** (Case Phase III), the result shows 0.53 and 0.65 and at last Table **3.34** (Case Phase IV) the result shows that 0.45 and 0.52 respectively statistically not significant. And in Case of regular media exposure odds were 0.56, 0.48, and 0.36 in Table 2, Table 3 and Table 4 were insignificant respectively.

Control Group result

The overall results of thinness were represented in **Table 3.36, 3.37, 3.38, and 3.39**. But the different result shown in Control Group of Phase I The results of the multinomial logistic regression model fitted to estimate the odds of being mild, moderate, severe and combined overall prevalence of thinness categories with socioeconomic, socio-demographic and lifestyle variables are depicted in Table **3.37**. denotes Control Phase I, different result found among girls were observed to exhibit significantly 1.49 times, 1.61 times, 2.22 times and 1.69 times greater odds than boys in mild, moderate, and severe categories of thinness ($p<0.01$). But the different result shows among girls in Table **3.38** (Control Phase II), were observed 1.31 times, 1.56 times, 2.02 times, 1.56 times, in Table 4 (Control Phase III), were observed 1.29 times, 1.32 times, 1.29 times, 1.45 times, in Table **3.38** (Control Phase IV), were observed 1.18 times, 1.41 times, 1.38 times, 1.41 times respectively. And among boys were 1.61 times, 1.48 times and 1.28 times respectively. In Table **3.37** (Control Phase I) the odds were higher among children belonging to higher age Groups of 4 years found to have 1.17 times significantly greater odds in prevalence of thinness in severe category ($p<0.05$). But 1.11 times in Table **3.37** (Control Phase II), 1.32 times in Table **3.38** (Control Phase II) and 1.29 times found in Table **3.39** (Control Phase IV) respectively. The results also showed in Table **3.37** (Case Phase I) that children belonging to the 'manual worker' father occupation category exhibited 1.61 times, 2.01 times and 0.60 times significant greater odds for being affected by mild, moderate and severe thinness prevalence categories, respectively ($p<0.01$). But in Table **3.37** (Control Phase II) result exhibited 1.61 times, 1.92 times and 1.48 times significant, In Table **3.38** (Control Phase III) result exhibited 1.36 times, 1.05 times and 1.49 times insignificant, In Table **3.39** (Control Phase IV) 1.39 times, 1.37 times and 1.45 times respectively significant. The odds were also observed in Table **3.37** (Control Phase I) to be significant higher ($p<0.05$) among those children residing households with no toilet facility

(mild thinness: 1.40; moderate thinness: 1.53; severe thinness: 1.42) ($p<0.05$). But in Table **3.37** (Control Phase II) shows the different result that household with no toilet facility (mild thinness: 1.40; moderate thinness: 1.53; severe thinness: 1.42). In Table **3.38** (Control Phase III) shows the result were (mild thinness: 1.35; moderate thinness: 1.61; severe thinness: 1.29). In Table 4 (Control Phase IV) shows the result were (mild thinness: 1.21; moderate thinness: 1.32; severe thinness: 1.21) respectively. A significantly lower risk of severe thinness (grade-III) and mild thinness were observed in Case of children belonging to better maternal education (e.g., literate and above) (odds 0.61; $p<0.01$ and 0.71; $p<0.05$) and regular media exposure (odds 0.39; $p<0.05$) in Table **3.37** (Control Phase I). But In Table **3.37** (Case Phase II), the odds were exhibited 0.49 and 0.75, In Table **3.38** (Control Phase III), the result shows 0.49 and 0.65 and at last Table **3.39** (Control Phase IV) the result shows that 0.47 and 0.25 respectively statistically not significant. And in Case of regular media exposure odds were 0.49, 0.47, and 0.31 in Table **3.37**, Table **3.38** and Table **3.39** were insignificant respectively.

MUAC (Wasting)

Case Group Data

The overall result of thinness were represented in **Table 3.40, 3.41, 3.42** and **3.43** The results of the logistic regression analysis showed that in Case Phase I, Phase II, Phase III and Phase IV in children aged 2 years and 3 years exhibited significant 1.8 times, 1.5 times, 1.3 times, 1.2 times greater odds in **Table 3.40, 3.41, 3.42** and **3.43** children being wasted ($p<0.05$) respectively. Girls exhibited a slightly greater risk to wasting as compared to boys ($p>0.05$). Children belonging to the ≥3rd birth orders and those residing in rural areas also exhibited significantly 1.20 times, 1.11 times, 1.01 times and 1.32 times risks of being wasted

(p<0.05) in table 1, table 2, table 3 and table 4 respectively. Children of illiterate mothers and those of mothers with primary education had 1.59 times, 1.51 times, 1.49 times and 1.38 times in table 1, table 2, table 3 and in table 4 greater risks of wasting (p<0.05), respectively. Children were belonging to the families where the household income of Rs. 2001-4000 had 1.28 times, 1.21 times, 1.20 times and 1.05 time greater odds of being wasted (p<0.05) in **Table 3.40, 3.41, 3.42** and **3.43** respectively. The association of toilet facility, electricity facility, father's education and father's and mother's occupation did not exhibit any statistically significant differences in the prevalence of wasting among the children (p>0.05) in all different study. However, the odds of wasting were insignificantly greater in children belonging to the illiterate fathers and fathers with primary education, manual worker Group and those having no electricity and toilet facilities (p>0.05) (Table 2)

Control Group Data

The overall result of thinness (base on MUAC) was represented in **Table 3.44, 3.45, 3.46 and 3.47.** The results of the logistic regression analysis showed that in Control Phase I, Phase II, Phase III and Phase IV in children aged 2 years and 3 years exhibited significant 1.10 times, 1.8 times, 1.1 times, 1.23 times greater odds in **Table 3.44, 3.45, 3.46 and 3.47** children being wasted (p<0.05) respectively. Girls exhibited a slightly greater risk to wasting as compared to boys (p>0.05). Children belonging to the ≥3rd birth orders and those residing in rural areas also exhibited significantly 1.03 times, 1.02 times, 1.12 times and 1.21 times risks of being wasted (p<0.05) in **Table 3.44, 3.45, 3.46 and 3.** respectively. Children of illiterate mothers and those of mothers with primary education had 1.51 times, 1.56 times, 1.03 times and 1.21 times in table 1, table 2, table 3 and in table 4 greater risks of wasting (p<0.05), respectively. Children were belonging to the families where the household income

of Rs. 2001-4000 had 1.01 times, 1.37 times, 1.28 times and 1.21 time greater odds of being wasted ($p<0.05$) in table 1, table 2, table 3 and in table 4 respectively.

The association of toilet facility, electricity facility, father's education and father's and mother's occupation did not exhibit any statistically significant differences in the prevalence of wasting among the children ($p>0.05$) in all different study. However, the odds of wasting were insignificantly greater in children belonging to the illiterate fathers and fathers with primary education, manual worker Group and those having no electricity and toilet facilities ($p>0.05$) (Table **3.45**).

Prevalence of under nutrition based on Stunting, Underweight and Wasting:

For Case Group

The overall result of undernutrition was represented in **Table 3.24, 3.25, 3.26** and **3.27.** The results of the logistic regression analysis showed that in Case Phase I, Phase II, Phase III and Phase IV the results further indicate that several variables have significant influences in determining whether a child was stunted, underweight or wasted. It was apparent that the odds of the girl children being stunted were 1.02 times, 1.04 times, 1.01 times, and 1.05 times in table 1, table 2, in table 3 and in table 4 found higher than boys. The odds of the female children being underweight and wasted were also higher in **Table 3.24, 3.25, 3.26** and **3.27** found (1.28, 1.35, 1.21, 1.14 and 1.66, 1.58, 1.45, 1.21 respectively). There was also an effect of the age Group on the prevalence of under nutrition. With the 3 years age Group being the reference category in all Cases, the odds of the children being underweight were higher among the 48 (months) years category, followed by the age Group

1year category in **Table 3.24, 3.25, 3.26** and **3.27.** (1.71, 1.65, 1.52, 1.25 and 1.69, 1.24, 1.54, 1.32 respectively). Birth order, ethnic Group and the nature of the area were found to be influence stunting, underweight, and wasting. In Case of birth order, with birth order 1 being the reference category, the odds of the birth order 2 children being stunted was (1.02, 1.14, 1.05 1.17) times higher than those children whose birth order was 3≥ in all Cases (1.10, 1.05, 1.08, 1.03). However, the odds of being underweight and wasted were lower (1.01, 1.06, 1.12, 1.09 and 1.39, 1.35, 1.25, 1.07 respectively). With the general caste children being the reference category, the odds of the children being underweight and wasting were higher among tribal children (1.25 and 1.07). The odds were also observed to be higher among rural areas children in Case of underweight in all Phases (1.13, 1.21, 1.0.2, 0.54) and wasted (1.34, 1.02, 1.09, 1.07), but not for stunted (0.85, 0.21, 0.45, 0.65). The odds were higher for stunting (1.12, 1.14, 1.21, 1.02) and underweight (1.24, 1.02, 1.06, 1.08) in Case of mother's age at child birth being ≤18 years. Odds of stunting, underweight and wasting found among to be higher in Case of the Hindu religion (1.073, 1.05, 1.07, 0.993 and 1.076, 1.02, 1.06, 1.14) respectively. The impact of the number of siblings, family size and birth interval on the prevalence of under nutrition was studied after Controlling the confounding factors of family income, education, nature of occupation, media exposure, hygiene and sanitation and use of electricity. A marginal effect of the number of sibling was noticed in the Case of underweight (odds of 1.22, 1.21, 1.14, and 1.16), stunting (odds of 0.99, 0.22, 0.27, and 0.35)

and wasting (odds of 0.86, 0.52, 0.84, and 0.41) for 3≥ siblings respectively. In Case of family size, a high odd of 1.09, 1.02, 1.11, 1.24 was found for 5≥ family size. The odds were lower for stunting and underweight for children aged <24 months (0.97, 0.95, 0.85, 0.82 and 0.90, 0.85, 0.78, 0.94 respectively). It was also observed with the secondary and above educated were the reference category, as the maternal education level increased, the odds of children being underweight and stunted decreased. The children whose mothers and fathers were illiterate and literate up to the primary level, the odds of children being stunted and underweight and wasted increased. The odds of stunting (1.12, 1.01, 1.09, 1.05), underweight (0.77, 0.76, 0.52, 0.64) and wasting (0.75, 0.65, 0.54, 0.84) was found to be higher among the illiterate mothers than the illiterate fathers (odds of stunting: 0.862, 0.54, 0.85, 0.57, 0.63 underweight: 1.215, 1.23, 1.27, 1.54 and wasting: 1.042, 1.05, 1.02, 1.05). The odds of being underweight was very high (1.531, 1.62, 1.34, 1.24) and wasting almost as high (1.234, 1.52, 1.45, 1.24) for illiterate and up to primary educated mothers. Mother's occupation appeared to have a negative impact on child under nutrition. The odds of being underweight were higher found for mothers working in the tea garden or engaged as labor (1.730, 1.74, 1.54, and 1.63). The odds of being underweight were 1.859, 1.54, and 1.65, 1.24 times higher for fathers employed in the tea gardens. Monthly family income also appeared to play an important role in child under nutrition. The odds of children being stunted were higher in the ≤ Rs. 2000 category than the Rs. 2001-Rs. 4000 category (1.389, 1.24, 1.32, 1.54 and 1.146,

1.54, 1.24, 1.45 respectively). However, in Case of underweight it was the reverse, with the Rs. 2001-Rs. 4000 category having the highest odds. It has also been found that mother's media exposure had an effect on underweight, wasting and stunting (odds of underweight (1.31, 1.39, 1.42, 1.54), wasting (1.20, 1.52, 1.42, 1.24) and stunting being (1.313, 1.083 and 0.979). There also appeared to have an effect of toilet facilities on the prevalence of underweight, stunting and wasting. The prevalence of these indices were higher in those household without toilet facilities, the odds were 1.313, 1.35, 1.24, 1.54 (underweight), 1.083, 1.02, 1.05, 1.07 (wasting) and 0.979, 0.85, 0.54, 0.47 (stunting). There was also an increase in the prevalence of underweight and wasting among children born in households with no electricity, with the odds being 1.511, 1.45, 1.24, 1.21 and 1.239, 1.29, 1.21, 1.32 respectively.

For Control Group

The overall result of undernutrition was represented in **Table 3.28, 3.29, 3.30** and **3.31.** The results of the logistic regression analysis showed that in Control Phase I, Phase II, Phase III and Phase IV the results further indicate that several variables have significant influences in determining whether a child was stunted, underweight or wasted. It was apparent that the odds of the girl children being stunted were 1.01 times, 1.12 times, 1.21 times, and 1.13 times in table 1, table 2, in table 3 and in table 4 found higher than boys. The odds of the female children being underweight and wasted were also higher in **Table 3.28,**

3.29, 3.30 and **3.31** found (1.24, 1.43, 1.31, 1.45 and 1.53, 1.08, 1.35, 1.11 respectively). There was also an effect of the age Group on the prevalence of under nutrition. With the 3 years age Group being the reference category in all Cases, the odds of the children being underweight were higher among the 48 (months) years category, followed by the age Group 1year category in **Table 3.28, 3.29, 3.30** and **3.31** found (1.31, 1.15, 1.22, 1.05 and 1.19, 1.04, 1.24, 1.12 respectively). Birth order, ethnic Group and the nature of the area were found to be influence stunting, underweight, and wasting. In Case of birth order, with birth order 1 being the reference category, the odds of the birth order 2 children being stunted was (1.03, 1.24, 1.15 1.27) times higher than those children whose birth order was 3≥ in all Cases (1.12, 1.04, 1.15, 1.17). However, the odds of being underweight and wasted were lower (1.03, 1.16, 1.11, 1.02 and 1.09, 1.25, 1.15, 1.37 respectively). With the general caste children being the reference category, the odds of the children being underweight and wasting were higher among tribal children (1.25 and 1.07). The odds were also observed to be higher among rural areas children in Case of underweight in all Phases (1.03, 1.11, 1.32, 0.14) and wasted (1.14, 1.22, 1.19, 1.17), but not for stunted (0.55, 0.31, 0.15, 0.25). The odds were higher for stunting (1.02, 1.24, 1.11, 1.12) and underweight (1.14, 1.22, 1.16, 1.38) in Case of mother's age at child birth being ≤18 years. Odds of stunting, underweight and wasting found among to be higher in Case of the Hindu religion (1.03, 1.15, 1.27, 0.93 and 1.06, 1.12, 1.02, 1.04) respectively. The impact of the number of siblings, family size and birth interval on the

prevalence of under nutrition was studied after Controlling the confounding factors of family income, education, nature of occupation, media exposure, hygiene and sanitation and use of electricity. A marginal effect of the number of sibling was noticed in the Case of underweight (odds of 1.02, 1.11, 1.04, and 1.26), stunting (odds of 0.89, 0.12, 0.17, and 0.25) and wasting (odds of 0.76, 0.42, 0.74, and 0.31) for 3≥ siblings respectively. In Case of family size, a high odd of 1.29, 1.12, 1.01, 1.14 was found for 5≥ family size. The odds were lower for stunting and underweight for children aged <24 months (0.87, 0.35, 0.65, 0.32 and 0.80, 0.75, 0.68, 0.84 respectively). It was also observed with the secondary and above educated were the reference category, as the maternal education level increased, the odds of children being underweight and stunted decreased. The children whose mothers and fathers were illiterate and literate up to the primary level, the odds of children being stunted, and underweight and wasted increased. The odds of stunting (1.02, 1.21, 1.19, 1.35), underweight (0.67, 0.26, 0.52, 0.24) and wasting (0.65, 0.35, 0.14, 0.54) was found to be higher among the illiterate mothers than the illiterate fathers (odds of stunting: 0.62, 0.24, 0.45, 0.37, 0.53 underweight: 1.15, 1.23, 1.27, 1.14 and wasting: 1.42, 1.25, 1.02, 1.15). The odds of being underweight was very high (1.01, 1.52, 1.14, 1.04) and wasting almost as high (1.34, 1.02, 1.25, 1.14) for illiterate and up to primary educated mothers. Mother's occupation appeared to have a negative impact on child under nutrition. The odds of being underweight were higher found for mothers working in the tea garden or engaged as labor (1.30, 1.14, 1.24, and

1.43). The odds of being underweight were 1.59, 1.24, and 1.15, 1.04 times higher for fathers employed in the tea gardens. Monthly family income also appeared to play an important role in child under nutrition. The odds of children being stunted were higher in the ≤ Rs. 2000 category than the Rs. 2001-Rs. 4000 category (1.09, 1.14, 1.22, 1.04 and 1.46, 1.24, 1.14, 1.05 respectively). However, in Case of underweight it was the reverse, with the Rs. 2001-Rs. 4000 category having the highest odds. It has also been found that mother's media exposure had an effect on underweight, wasting and stunting (odds of underweight (1.21, 1.19, 1.32, 1.44), wasting (1.10, 1.42, 1.02, 1.14) and stunting being (1.13, 1.03 and 0.99). There also appeared to have an effect of toilet facilities on the prevalence of underweight, stunting and wasting. The prevalence of these indices were higher in those household without toilet facilities, the odds were 1.13, 1.15, 1.19, 1.04 (underweight), 1.03, 1.12, 1.25, 1.17 (wasting) and 0.79, 0.65, 0.24, 0.07 (stunting). There was also an increase in the prevalence of underweight and wasting among children born in households with no electricity, with the odds being 1.11, 1.25, 1.14, 1.11 and 1.39, 1.19, 1.01, 1.23 respectively.

Compression of pure longitudinal data of socioeconomic and demographic and life style related factors for all Phases of Case and Control Group data (based on WAZ)

The overall comparison of result shows in **Table 3.48** and **3.49** shows that the significant odds were found among girls (1.21 in Phase I and Phase III, 1.23,), 12-23, 24-35, and 48-59 (1.59, 1.69,16.1,1.62 in Phase I, II, III and IV) age Group of children, mother's

education primary level (0.76 in Phase I), those are living in kucca house (1.25 in Phase I), media exposure not regularly (1.50, 1.52,1.53 in Phase I, Phase III and Phase IV), no toilet facility (1.70, 1.72 in Phase I and Phase II) and father's belong to manual category (1.37, 1.47 in Phase I and Phase II).

The overall comparison of result shows in **Table 3.48** and **3.49** shows that the significant odds were found among girls (1.28 in Phase I, 1.13 in Phase II , Phase III, 1.22 and 1.15 in Phase IV), 12-23, 24-35, and 48-59 (1.69, 1.49,1..25,1.69 in Phase I, II, III and IV) age Group of children, mother's education primary level (0.77 in Phase I), those are living in pucca house (1.25, 1.25, 1.25 and 1.25 in Phase I, II, III and IV), media exposure not regularly (1.50, 1.52,1.53 in Phase I, Phase III and Phase IV), no toilet facility (1.70, 1.70, 1.70, 1.70 in Phase I and Phase II, III and IV) and mother's belong to manual category (1.37, 1.37, 1.37 and 1.37 in Phase I and Phase II, III and IV).

The figure 3.4 was represented the comparison of children data according to Case and Control study.

Table 3.24: Effect of Socio-economic, Demographic and life style related factors on under nutrition in ICDS children (Case Group)

Variable		N(315)		Stunting				Underweight					Wasting				
						Odds	95% CI				Odds	95% CI			B	Odds	95% CI
Gender	**Boys ®**	164	103	62.05	-	-	-	111	63.79	-	-	-	105	62.50	-	-	-
	Girls	151	63	37.95	0.21	1.02	0.83-1.25	63	36.21	0.14	1.28	1.03-1.58	63	37.50	0.2	1.45	1.28-2.14
Age (in months)	**12-23**	44	32	19.28	0.16	0.99	1.29-2.63	40	22.99	0.1	1.1	1.18-2.42	34	20.24	0.34	1.23	0.87-2.07
	24-35	85	22	13.25	0.13	0.97	0.94-1.89	22	12.64	-0.16	0.85	1.08-2.19	22	13.10	0.16	1.03	1.06-2.45
	36-47 ®	68	29	17.47	-	-	-	29	16.67	-	-	-	29	17.26	-	-	-
	48-59	54	53	31.93	0.61	1.84**	1.30-2.61	53	30.46	0.53	1.71**	1.20-2.43	53	31.55	0.12	1.13	0.73-1.75
	60	65	30	18.07	0.41	1.51*	1.09-2.07	30	17.24	0.31	1.37	0.99-1.88	30	17.86	0.26	1.30	0.87-1.92
Birth order	**1 ®**	135	32	19.28	-	-	-	40	22.99	-	-	-	34	20.24	-	-	-
	2	117	78	46.99	0.15	1.17	0.89-1.47	78	44.83	0.01	1.01	0.78-1.30	78	46.43	0.33	1.39*	1.03-1.88
	3≥	63	56	33.73	0.11	1.09	0.85-1.43	56	32.18	0.08	1.09	0.83-1.41	56	33.33	0.15	1.17	0.84-1.60
Water facilities	**Yes**	154	60	36.14	-0.17	0.84	0.65-1.12	68	39.08	0.12	1.13	0.85-1.49	62	36.90	0.29	1.34	0.94-1.89
	No ®	161	106	63.86	-	-	-	106	60.92	-	-	-	106	63.10	-	-	-
Mothers age at child birth	**≤ 18 years**	198	63	37.95	0.11	1.12	0.89-1.41	71	40.80	0.22	1.24	0.98-1.58	65	38.69	0.08	1.08	0.81-1.43
	≥19 years ®	117	103	62.05	-	-	-	103	59.20	-	-	-	103	61.31	-	-	-
Birth interval	**< 24 months ®**	165	69	41.57	-	-	-	71	40.80	-	-	-	68	40.48	-	-	-
	≥ 24 months	150	97	58.43	-0.03	0.97	0.78-1.20	103	59.20	-0.11	0.90	0.72-1.12	100	59.52	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	190	79	47.59	-	-	-	79	45.40	-	-	-	76	45.24	-	-	-
	Primary ≥	125	87	52.41	0.11	1.12	0.91-1.38	95	54.60	-0.26	0.77*	0.62-0.95	92	54.76	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	121	61	36.75	-	-	-	74	42.53	-	-	-	70	41.67	-	-	-
	Primary ≥	194	144	86.75	0.26	1.30*	1.04-1.62	100	57.47	0.07	1.07	0.86-1.35	98	58.33	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	176	45	47.59	-	-	-	111	47.59	-	-	-	65	47.59		-	-
	Pucca®	139	22	52.41	-0.08	0.92	0.75-1.14	25	52.41	0.23	1.25*	1.01-1.55	55	52.41	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	149	56	33.73	-	-	-	64	36.78	-	-	-	58	34.52	-	-	-
	Not regularly	166	110	66.27	0.04	1.04	0.84-1.28	110	63.22	0.40	1.50**	1.20-1.86	110	65.48	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	198	67	40.36	-	-	-	67	38.51	-	-	-	67	39.88	-	-	-
	3 ≥	117	99	59.64	-0.01	0.99	0.80-1.22	99	56.90	0.20	1.22	0.98-1.51	99	58.93	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	140	73	43.98	-	-	-	77	44.25	-	-	-	71	42.26	-	-	-
	5 ≥	175	93	56.02	-0.04	0.97	0.78-1.19	97	55.75	0.08	1.09	0.88-1.35	97	57.74	-0.19	0.83	0.65-1.07
Toilet facility	**No**	165	72	43.37	0.11	1.17	0.91-1.38	76	43.68	0.28	1.33*	1.07-1.65	70	41.67	0.25	1.29*	1.00-1.65
	Yes ®	150	94	56.63	-	-	-	98	56.32	-	-	-	98	58.33	-	-	-
Electricity	**No**	187	107	64.46	0.28	1.33*	1.04-1.71	107	61.49	0.53	1.70**	1.30-2.22	101	60.12	0.47	1.61**	1.21-2.13
	Yes ®	128	59	35.54	-	-	-	67	38.51	-	-	-	67	39.88	-	-	-
Mother occupation	**Housewife ®**	215	45	27.11	-	-	-	53	30.46	-	-	-	53	31.55	-	-	-
	Manual worker	100	121	72.89	-0.03	0.97	0.79-1.20	121	69.54	0.22	1.25	1.00-1.55	115	68.45	-0.05	0.95	1.88-2.22
Fathers occupation	**Manual worker**	172	76	45.78	0.07	1.07	0.83-1.38	79	45.40	0.31	1.37*	1.06-1.77	73	43.45	0.17	1.19	0.91-2.98
	Others ®	143	90	54.22	-	-	-	95	54.60	-	-	-	95	56.55	-	-	-
Income	**≤ Rs. 2000**	70	35	21.08	0.21	1.23	0.87-1.75	35	20.11	0.10	1.11	0.78-1.59	35	20.83	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	75	45.18	0.03	1.03	0.78-1.35	83	47.70	0.21	1.24	0.94-1.64	83	49.40	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	174	56	33.73	-	-	-	56	32.18	-	-	-	50	29.76	-	-	-

Table 3.25: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Case Group)

Variable		N (308)	Stunting					Underweight					Wasting				
			Frequency	B	Odds	95% CI		Frequency	B	Odds	95% CI		Frequency	B	Odds	95% CI	
Gender	**Boys ®**	101	106	62.72	-	-	-	105	66.46	-	-	-	100	65.36	-	-	-
	Girls	207	63	37.28	0.13	1.04	0.82-1.15	53	33.54	0.25	1.21	1.03-1.58	53	34.64	0.51	1.48**	1.28-2.14
Age (in months)	**12-23**	58	35	20.71	0.72	1.93	1.21-2.23	34	21.52	0.52	1.69**	1.18-2.42	34	22.22	0.30	1.35	0.87-2.07
	24-35	73	22	13.02	0.38	1.42	0.92-1.89	22	13.92	0.43	1.54*	1.08-2.19	22	14.38	0.48	1.61*	1.06-2.45
	36-47 ®	57	29	17.16	-	-	-	29	18.35	-	-	-	24	15.69	-	-	-
	48-59	64	53	31.36	0.73	1.93	1.31-2.61	53	33.54	0.53	1.71**	1.20-2.43	53	34.64	0.12	1.13	0.73-1.75
	60	56	30	17.75	0.52	1.65	1.02-2.07	20	12.66	0.31	1.37	0.99-1.88	20	13.07	0.26	1.30	0.87-1.92
Birth order	**1 ®**	128	35	20.71	-	-	-	34	21.52	-	-	-	34	22.22	-	-	-
	2	117	78	46.15	0.23	1.25	1.91-2.37	78	49.37	0.01	1.01	0.78-1.30	78	50.98	0.33	1.39*	1.03-1.88
	3≥	63	56	33.14	0.1	1.23	1.04-1.14	46	29.11	0.08	1.09	0.83-1.41	41	26.80	0.15	1.17	0.84-1.60
Water facilities	**Yes**	150	63	37.28	-0.05	0.95	1.28-1.52	62	39.24	0.12	1.13	0.85-1.49	62	40.52	0.29	1.34	0.94-1.89
	No ®	158	106	62.72	-	-	-	96	60.76	-	-	-	91	59.48	-	-	-
Mothers age at child birth	**≤ 18 years**	190	66	39.05	0.24	1.21	0.86-1.41	65	41.14	0.22	1.24	0.98-1.58	60	39.22	0.08	1.08	0.81-1.43
	≥19 years ®	118	103	60.95	-	-	-	93	58.86	-	-	-	93	60.78	-	-	-
Birth interval	**< 24 months ®**	155	72	42.60	-	-	-	71	44.94	-	-	-	71	46.41	-	-	-
	≥ 24 months	153	97	57.40	0.06	1.06	0.75-1.20	87	55.06	-0.11	0.90	0.72-1.12	82	53.59	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	198	82	48.52	-	-	-	81	51.27	-	-	-	81	52.94	-	-	-
	Primary ≥	110	87	51.48	0.26	1.23	0.92-1.38	77	48.73	-0.26	0.77*	0.62-0.95	72	47.06	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	121	64	37.87	-	-	-	63	39.87	-	-	-	63	41.18	-	-	-
	Primary ≥	187	105	62.13	0.33	1.2	1.04-1.62	95	60.13	0.07	1.07	0.86-1.35	90	58.82	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	172	68	40.24	-	-	-	68	43.04	-	-	-	63	41.18		-	-
	Pucca®	136	101	59.76	0.01	1.01	0.75-1.14	90	56.96	0.23	1.25*	1.01-1.55	90	58.82	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	141	59	34.91	-	-	-	58	36.71	-	-	-	58	37.91	-	-	-
	Not regularly	167	110	65.09	0.12	1.12	0.84-1.28	100	63.29	0.40	1.50**	1.20-1.86	95	62.09	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	190	70	41.42	-	-	-	69	43.67	-	-	-	64	41.83	-	-	-
	3 ≥	116	99	58.58	0.03	1.03	0.80-1.22	89	56.33	0.20	1.22	0.98-1.51	89	58.17	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	136	76	44.97	-	-	-	75	47.47	-	-	-	70	45.75	-	-	-
	5 ≥	172	93	55.03	0.03	1.03	0.78-1.19	83	52.53	0.08	1.09	0.88-1.35	83	54.25	-0.19	0.83	0.65-1.07
Toilet facility	**No**	161	75	44.38	0.22	1.22	0.91-1.38	74	46.84	0.28	1.33*	1.07-1.65	69	45.10	0.25	1.29*	1.00-1.65
	Yes ®	147	94	55.62	-	-	-	84	53.16	-	-	-	84	54.90	-	-	-
Electricity	**No**	183	104	61.54	0.33	1.43	1.04-1.71	103	65.19	0.53	1.70**	1.30-2.22	103	67.32	0.47	1.61**	1.21-2.13
	Yes ®	125	65	38.46	-	-	-	55	34.81	-	-	-	50	32.68	-	-	-
Mother occupation	**Housewife ®**	210	33	19.53	-	-	-	32	20.25	-	-	-	32	20.92	-	-	-
	Manual worker	98	136	80.47	0.06	1.03	0.79-1.20	126	79.75	0.22	1.25	1.00-1.55	121	79.08	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	168	76	44.97	0.14	1.14	0.83-1.38	75	47.47	0.31	1.37*	1.06-1.77	70	45.75	0.17	1.19	0.87-1.63
	Others ®	140	93	55.03	-	-	-	83	52.53	-	-	-	83	54.25	-	-	-
Income	**≤ Rs. 2000**	170	38	22.49	0.32	1.32	0.87-1.75	28	17.72	0.10	1.11	0.78-1.59	28	18.30	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	75	44.38	0.11	1.12	0.78-1.35	75	47.47	0.21	1.24	0.94-1.64	70	45.75	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	56	33.14	-	-	-	55	34.81	-	-	-	55	35.95	-	-	-

Table 3.26: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Case Group)

Variable		N (297)	Stunting					Underweight					Wasting				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	157	98	60.87	-	-	-	94	59.87	-	-	-	81	56.25	-	-	-
	Girls	141	63	39.13	0.12	1.01	0.83-1.25	63	40.13	0.25	1.14	1.03-1.58	63	43.75	0.51	1.49	1.28-2.14
Age (in months)	**12-23**	36	32	19.88	0.71	1.95	1.29-2.63	23	14.65	0.52	1.52	1.18-2.42	10	6.94	0.30	1.54	0.87-2.07
	24-35	67	22	13.66	0.39	1.43	0.94-1.89	22	14.01	0.43	1.54*	1.08-2.19	22	15.28	0.48	1.61*	1.06-2.45
	36-47 ®	64	24	14.91	-	-	-	29	18.47	-	-	-	29	20.14	-	-	-
	48-59	66	53	32.92	0.71	1.94	1.30-2.61	53	33.76	0.53	1.71**	1.20-2.43	53	36.81	0.12	1.13	0.73-1.75
	60	64	30	18.63	0.51	1.61	1.09-2.07	30	19.11	0.31	1.37	0.99-1.88	30	20.83	0.26	1.30	0.87-1.92
Birth order	**1 ®**	123	32	19.88	-	-	-	23	14.65	-	-	-	10	6.94	-	-	-
	2	112	73	45.34	0.24	1.05	1.92-2.37	78	49.68	0.01	1.01	0.78-1.30	78	54.17	0.33	1.39*	1.03-1.88
	3≥	62	56	34.78	0.2	1.08	1.05-1.14	56	35.67	0.08	1.12	0.83-1.41	56	38.89	0.15	1.25	0.84-1.60
Water facilities	**Yes**	145	62	38.51	-0.07	0.97	1.29-1.52	68	43.31	0.12	1.13	0.85-1.49	68	47.22	0.29	1.34	0.94-1.89
	No ®	152	99	61.49	-	-	-	89	56.69	-	-	-	76	52.78	-	-	-
Mothers age at child birth	**≤ 18 years**	190	60	37.27	0.21	1.07	0.89-1.41	71	45.22	0.22	1.06	0.98-1.58	71	49.31	0.08	1.08	0.81-1.43
	≥19 years ®	107	105	65.22	-	-	-	120	76.43	-	-	-	133	92.36	-	-	-
Birth interval	**< 24 months ®**	150	65	40.37	-	-	-	88	56.05	-	-	-	101	70.14	-	-	-
	≥ 24 months	147	100	62.11	0.07	0.85	0.78-1.20	103	65.61	-0.11	0.78	0.72-1.12	103	71.53	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	193	73	45.34	-	-	-	96	61.15	-	-	-	109	75.69	-	-	-
	Primary ≥	104	92	57.14	0.21	1.09	0.91-1.38	95	60.51	-0.26	0.52	0.62-0.95	95	65.97	-0.29	0.54	0.58-0.96
Father education	**Illiterate ®**	110	70	43.48	-	-	-	74	47.13	-	-	-	74	51.39	-	-	-
	Primary ≥	187	95	59.01	0.36	1.41	1.04-1.62	117	74.52	0.07	1.07	0.86-1.35	130	90.28	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	172	64	39.75	-	-	-	73	46.50	-	-	-	73	50.69		-	-
	Pucca®	125	101	62.73	0.02	1.02	0.75-1.14	118	75.16	0.23	1.25*	1.01-1.55	131	90.97	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	130	53	32.92	-	-	-	64	40.76	-	-	-	64	44.44	-	-	-
	Not regularly	167	112	69.57	0.14	1.14	0.84-1.28	127	80.89	0.40	1.50**	1.20-1.86	140	97.22	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	179	62	38.51	-	-	-	67	42.68	-	-	-	67	46.53	-	-	-
	3 ≥	118	101	62.73	0.09	1.09	0.80-1.22	116	73.89	0.20	1.22	0.98-1.51	129	89.58	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	125	73	45.34	-	-	-	94	59.87	-	-	-	107	74.31	-	-	-
	5 ≥	172	92	57.14	0.06	1.07	0.78-1.19	97	61.78	0.08	1.09	0.88-1.35	97	67.36	-0.19	0.83	0.65-1.07
Toilet facility	**No**	150	70	43.48	0.21	1.27	0.91-1.38	76	48.41	0.28	1.33*	1.07-1.65	76	52.78	0.25	1.29*	1.00-1.65
	Yes ®	147	95	59.01	-	-	-	115	73.25	-	-	-	128	88.89	-	-	-
Electricity	**No**	172	103	63.98	0.38	1.43	1.04-1.71	124	78.98	0.53	1.70**	1.30-2.22	137	95.14	0.47	1.61**	1.21-2.13
	Yes ®	125	62	38.51	-	-	-	67	42.68	-	-	-	67	46.53	-	-	-
Mother occupation	**Housewife ®**	199	53	32.92	-	-	-	53	33.76	-	-	-	53	36.81	-	-	-
	Manual worker	98	112	69.57	0.07	1.07	0.79-1.20	138	87.90	0.22	1.25	1.00-1.55	151	104.86	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	157	73	45.34	0.17	1.17	0.83-1.38	79	50.32	0.31	1.37*	1.06-1.77	79	54.86	0.17	1.19	0.87-1.63
	Others ®	140	92	57.14	-	-	-	112	71.34	-	-	-	125	86.81	-	-	-
Income	**≤ Rs. 2000**	159	30	18.63	0.31	1.33	0.87-1.75	35	22.29	0.10	1.11	0.78-1.59	35	24.31	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	83	51.55	0.13	1.13	0.78-1.35	83	52.87	0.21	1.24	0.94-1.64	83	57.64	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	52	32.30			-	73	46.50	-	-	-	86	59.72	-	-	-

Table 3.27: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Case Group)

Variable		N (284)	Stunting					Underweight					Wasting				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	143	81	56.25	-	-	-	98	60.87	-	-	-	113	64.20	-	-	-
	Girls	141	63	43.75	0.03	1.05	1.33-2.92	63	39.13	0.2	1.66	1.35-3.04	63	35.80	0.24	1.21	1.46-3.72
Age (in months)	**12-23**	38	10	6.94	0.51	1.23	0.7-2.06	27	16.77	0.34	1.25	0.79-2.17	47	26.70	0.39	1.32	1.93-4.37
	24-35	49	22	15.28	0.23	1.31	0.91-2.32	22	13.66	0.16	1.03	0.93-2.45	22	12.50	0.05	0.92	1.06-3.14
	36-47 ®	59	29	20.14	-	-	-	29	18.01	-	-	-	24	13.64	-	-	-
	48-59	64	53	36.81	0.61	1.84**	1.30-2.61	53	32.92	0.53	1.71**	1.20-2.43	53	30.11	0.12	1.13	0.73-1.75
	60	74	30	20.83	0.41	1.51*	1.09-2.07	30	18.63	0.31	1.37	0.99-1.88	30	17.05	0.26	1.30	0.87-1.92
Birth order	**1 ®**	115	10	6.94	-	-	-	27	16.77	-	-	-	47	26.70	-	-	-
	2	107	78	54.17	0.14	1.17	0.89-1.47	78	48.45	0.01	1.01	0.78-1.30	73	41.48	0.33	1.39*	1.03-1.88
	3≥	62	56	38.89	0.10	1.03	0.85-1.43	56	34.78	0.08	1.09	0.83-1.41	56	31.82	0.15	1.07	0.84-1.60
Water facilities	**Yes**	132	68	47.22	-0.16	0.85	0.65-1.12	68	42.24	0.12	1.25	0.85-1.49	97	55.11	0.29	1.09	0.94-1.89
	No ®	152	76	52.78	-	-	-	93	57.76	-	-	-	79	44.89	-	-	-
Mothers age at child birth	**≤ 18 years**	180	71	49.31	0.11	1.02	0.89-1.41	71	44.10	0.22	1.08	0.98-1.58	95	53.98	0.08	1.19	0.81-1.43
	≥19 years ®	104	133	92.36	-	-	-	116	72.05	-	-	-	125	71.02	-	-	-
Birth interval	**< 24 months ®**	142	101	70.14	-	-	-	84	52.17	-	-	-	120	68.18	-	-	-
	≥ 24 months	142	103	71.53	-0.03	0.82	0.78-1.20	103	63.98	-0.11	0.90	0.72-1.12	100	56.82	0.08	0.94	0.84-1.41
Mother education	**Illiterate ®**	180	109	75.69	-	-	-	92	57.14	-	-	-	128	72.73	-	-	-
	Primary ≥	104	95	65.97	0.11	1.12	0.91-1.38	95	59.01	-0.26	1.54*	0.62-0.95	92	52.27	-0.29	1.07	0.58-0.96
Father education	**Illiterate ®**	97	74	51.39	-	-	-	74	45.96	-	-	-	105	59.66	-	-	-
	Primary ≥	187	130	90.28	0.26	1.30*	1.04-1.62	113	70.19	0.07	1.07	0.86-1.35	115	65.34	-0.02	0.84	0.75-1.28
House Pattern	**Kaccha**	159	73	50.69	-	-	-	73	45.34	-	-	-	99	56.25		-	-
	Pucca®	125	131	90.97	-0.08	0.92	0.75-1.14	114	70.81	0.23	1.24*	1.01-1.55	121	68.75	0.07	1.14*	0.84-1.38
Media exposure	**Regularly ®**	117	64	44.44	-	-	-	64	39.75	-	-	-	88	50.00	-	-	-
	Not regularly	167	140	97.22	0.04	0.97	0.84-1.28	123	76.40	0.40	1.54**	1.20-1.86	132	75.00	0.32	1.24*	1.07-1.77
Siblings	**1-2 ®**	166	67	46.53	-	-	-	67	41.61	-	-	-	99	56.25	-	-	-
	3 ≥	118	129	89.58	-0.01	0.35	0.80-1.22	112	69.57	0.20	1.16	0.98-1.51	121	68.75	-0.15	0.41	0.67-1.11
Family size	**≥ 4 ®**	112	107	74.31	-	-	-	90	55.90	-	-	-	128	72.73	-	-	-
	5 ≥	172	97	67.36	-0.04	0.97	0.78-1.19	97	60.25	0.08	1.24	0.88-1.35	92	52.27	-0.19	0.83	0.65-1.07
Toilet facility	**No**	137	76	52.78	0.11	0.47	0.91-1.38	76	47.20	0.28	1.54*	1.07-1.65	105	59.66	0.25	1.07	1.00-1.65
	Yes ®	147	128	88.89	-	-	-	111	68.94	-	-	-	115	65.34	-	-	-
Electricity	**No**	159	137	95.14	0.28	1.03	1.04-1.71	120	74.53	0.53	1.70**	1.30-2.22	123	69.89	0.47	1.61**	1.21-2.13
	Yes ®	125	67	46.53	-	-	-	67	41.61	-	-	-	97	55.11	-	-	-
Mother occupation	**Housewife ®**	186	53	36.81	-	-	-	53	32.92	-	-	-	53	30.11	-	-	-
	Manual worker	98	151	104.86	-0.03	0.97	0.79-1.20	134	83.23	0.22	1.63*	1.00-1.55	167	94.89	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	144	79	54.86	0.07	1.07	0.83-1.38	79	49.07	0.31	1.54*	1.06-1.77	73	41.48	0.17	1.24	0.87-1.63
	Others ®	140	125	86.81	-	-	-	108	67.08	-	-	-	147	83.52	-	-	-
Income	**≤ Rs. 2000**	146	35	24.31	0.21	1.23	0.87-1.75	35	21.74	0.10	1.52	0.78-1.59	65	36.93	0.27	1.23	0.86-2.00
	Rs.2001-4000	71	83	57.64	0.03	1.03	0.78-1.35	83	51.55	0.21	1.45	0.94-1.64	83	47.16	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	86	59.72	-	-	-	69	42.86	-	-	-	72	40.91	-	-	-

Table 3.28: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Control Group)

Variable		N (319)	Stunting					Underweight					Wasting				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	164	133	67.86	-	-	-	104	62.28	-	-	-	98	60.87	-	-	-
	Girls	155	63	32.14	0.12	0.99	0.83-1.25	63	37.72	0.48	1.33	1.03-1.58	63	39.13	0.04	0.85	1.28-2.14
Age (month)	**12-23**	55	67	34.18	0.09	0.97	1.29-2.63	33	19.76	0.17	0.97	1.18-2.42	27	16.77	0.31	1.12	0.87-2.07
	24-35	81	22	11.22	0.24	1.17	0.94-1.89	22	13.17	0.27	1.07	1.08-2.19	22	13.66	0.17	0.97	1.06-2.45
	36-47 ®	68	24	12.24	-	-	-	29	17.37	-	-	-	29	18.01	-	-	-
	48-59	50	53	27.04	0.61	1.84**	1.30-2.61	53	31.74	0.53	1.71**	1.20-2.43	53	32.92	0.12	1.13	0.73-1.75
	60	65	30	15.31	0.41	1.51*	1.09-2.07	30	17.96	0.31	1.37	0.99-1.88	30	18.63	0.26	1.30	0.87-1.92
Birth order	**1 ®**	150	67	34.18	-	-	-	33	19.76	-	-	-	27	16.77	-	-	-
	2	107	73	37.24	0.14	1.14	0.89-1.47	78	46.71	0.01	1.01	0.78-1.30	78	48.45	0.13	1.39*	1.03-1.88
	3≥	62	56	28.57	0.10	1.10	0.85-1.43	56	33.53	0.08	1.09	0.83-1.41	56	34.78	0.15	1.17	0.84-1.60
Water facilities	**Yes**	167	97	49.49	-0.16	0.85	0.65-1.12	68	40.72	0.12	1.13	0.85-1.49	68	42.24	0.29	1.34	0.94-1.89
	No ®	152	99	50.51	-	-	-	99	59.28	-	-	-	93	57.76	-	-	-
Mothers age at child birth	**≤ 18 years**	215	95	48.47	0.11	1.12	0.89-1.41	71	42.51	0.22	1.24	0.98-1.58	71	44.10	0.08	1.08	0.81-1.43
	≥19 years ®	104	105	53.57	-	-	-	110	65.87	-	-	-	116	72.05	-	-	-
Birth interval	**< 24 months ®**	177	100	51.02	-	-	-	78	46.71	-	-	-	84	52.17	-	-	-
	≥ 24 months	142	100	51.02	-0.03	0.97	0.78-1.20	103	61.68	-0.11	0.90	0.72-1.12	103	63.98	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	215	108	55.10	-	-	-	86	51.50	-	-	-	92	57.14	-	-	-
	Primary ≥	104	92	46.94	0.11	1.12	0.91-1.38	95	56.89	-0.26	0.77*	0.62-0.95	95	59.01	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	132	105	53.57	-	-	-	74	44.31	-	-	-	74	45.96	-	-	-
	Primary ≥	187	95	48.47	0.26	1.30*	1.04-1.62	107	64.07	0.07	1.07	0.86-1.35	113	70.19	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	194	99	50.51	-	-	-	73	43.71	-	-	-	73	45.34		-	-
	Pucca	125	101	51.53	-0.08	0.92	0.75-1.14	108	64.67	0.23	1.25*	1.01-1.55	114	70.81	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	152	88	44.90	-	-	-	64	38.32	-	-	-	64	39.75	-	-	-
	Not regularly	167	112	57.14	0.04	1.04	0.84-1.28	117	70.06	0.40	1.50**	1.20-1.86	123	76.40	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	201	99	50.51	-	-	-	67	40.12	-	-	-	67	41.61	-	-	-
	3 ≥	118	101	51.53	-0.01	0.99	0.80-1.22	106	63.47	0.20	1.22	0.98-1.51	112	69.57	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	157	108	55.10	-	-	-	84	50.30	-	-	-	90	55.90	-	-	-
	5 ≥	162	92	46.94	-0.04	0.97	0.78-1.19	97	58.08	0.08	1.09	0.88-1.35	97	60.25	-0.19	0.83	0.65-1.07
Toilet facility	**No**	172	105	53.57	0.11	1.17	0.91-1.38	76	45.51	0.28	1.33	1.07-1.65	76	47.20	0.25	1.29*	1.00-1.65
	Yes ®	147	95	48.47	-	-	-	105	62.87	-	-	-	111	68.94	-	-	-
Electricity	**No**	159	103	52.55	0.25	1.37	1.04-1.71	114	68.26	0.53	1.70**	1.30-2.22	120	74.53	0.47	1.61**	1.21-2.13
	Yes ®	160	97	49.49	-	-	-	67	40.12	-	-	-	67	41.61	-	-	-
Mother occupation	**Housewife ®**	196	53	27.04	-	-	-	53	31.74	-	-	-	53	32.92	-	-	-
	Manual worker	133	147	75.00	-0.03	0.97	0.79-1.20	128	76.65	0.22	1.25	1.00-1.55	134	83.23	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	144	73	37.24	0.07	1.07	0.83-1.38	79	47.31	0.31	1.37*	1.06-1.77	79	49.07	0.17	1.19	0.87-1.63
	Others ®	175	127	64.80	-	-	-	102	61.08	-	-	-	108	67.08	-	-	-
Income	**≤ Rs. 2000**	181	65	33.16	0.21	1.23	0.87-1.75	35	20.96	0.10	1.11	0.78-1.59	35	21.74	0.27	1.31	0.86-2.00
	Rs.2001-4000	87	83	42.35	0.03	1.03	0.78-1.35	83	49.70	0.21	1.24	0.94-1.64	83	51.55	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	51	52	26.53	-	-	-	63	37.72	-	-	-	69	42.86	-	-	-

(p value *<0.05, **<0.0

Table 3. 29: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Control Group)

Variable	N (240)		Stunting					Underweight						Wasting			
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI		Frequency	B	Odds	95% CI
Gender	**Boys ®**	123	87	58.00	-	-	-	94	59.87	-	-	-	133	67.86	-	-	-
	Girls	117	63	42.00	0.11	1.12	0.83-1.25	63	40.13	0.27	1.14	1.03-1.58	63	32.14	0.31	1.12	1.28-2.14
Age (months)	**12-23**	26	21	14.00	0.26	1.3	1.29-2.63	23	14.65	0.23	1.1	1.18-2.42	67	34.18	0.46	1.3	0.87-2.07
	24-35	48	22	14.67	-0.08	0.92	0.94-1.89	22	14.01	0.43	1.54*	1.08-2.19	22	11.22	0.48	1.61*	1.06-2.45
	36-47 ®	63	24	16.00	-	-	-	29	18.47	-	-	-	24	12.24	-	-	-
	48-59	56	53	35.33	0.61	1.84**	1.30-2.61	53	33.76	0.53	1.71**	1.20-2.43	53	27.04	0.12	1.13	0.73-1.75
	60	47	30	20.00	0.41	1.51*	1.09-2.07	30	19.11	0.31	1.37	0.99-1.88	30	15.31	0.26	1.30	0.87-1.92
Birth order	**1 ®**	111	21	14.00	-	-	-	23	14.65	-	-	-	67	34.18	-	-	-
	2	73	73	48.67	0.14	1.14	0.89-1.47	78	49.68	0.01	1.01	0.78-1.30	73	37.24	0.33	1.39*	1.03-1.88
	3≥	56	56	37.33	0.10	1.10	0.85-1.43	56	35.67	0.08	1.09	0.83-1.41	56	28.57	0.15	1.17	0.84-1.60
Water facilities	**Yes**	139	62	41.33	-0.16	0.85	0.65-1.12	68	43.31	0.12	1.13	0.85-1.49	97	49.49	0.29	1.34	0.94-1.89
	No ®	101	88	58.67	-	-	-	89	56.69	-	-	-	99	50.51	-	-	-
Mothers age at child birth	**≤ 18 years**	137	60	40.00	0.11	1.12	0.89-1.41	71	45.22	0.22	1.24	0.98-1.58	95	48.47	0.08	1.08	0.81-1.43
	≥19 years ®	103	116	77.33	-	-	-	120	76.43	-	-	-	105	53.57	-	-	-
Birth interval	**< 24 months ®**	140	76	50.67	-	-	-	88	56.05	-	-	-	100	51.02	-	-	-
	≥ 24 months	100	100	66.67	-0.03	0.97	0.78-1.20	103	65.61	-0.11	0.90	0.72-1.12	100	51.02	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	148	84	56	-	-	-	96	61.15	-	-	-	108	55.10	-	-	-
	Primary ≥	92	92	61.33	0.11	1.12	0.91-1.38	95	60.51	-0.26	0.77*	0.62-0.95	92	46.94	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	147	70	46.67	-	-	-	74	47.13	-	-	-	105	53.57	-	-	-
	Primary ≥	93	106	70.67	0.26	1.30*	1.04-1.62	117	74.52	0.07	1.07	0.86-1.35	95	48.47	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	141	64	42.67	-	-	-	73	46.50	-	-	-	99	50.51		-	-
	Pucca	99	112	74.67	-0.08	0.92	0.75-1.14	118	75.16	0.23	1.25*	1.01-1.55	101	51.53	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	130	53	35.33	-	-	-	64	40.76	-	-	-	88	44.90	-	-	-
	Not regularly	110	123	82	0.04	1.04	0.84-1.28	127	80.89	0.40	1.50**	1.20-1.86	112	57.14	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	141	62	41.33	-	-	-	67	42.68	-	-	-	99	50.51	-	-	-
	3 ≥	99	112	74.67	-0.01	0.99	0.80-1.22	116	73.89	0.20	1.22	0.98-1.51	101	51.53	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	148	84	56.00	-	-	-	94	59.87	-	-	-	108	55.10	-	-	-
	5 ≥	92	92	61.33	-0.04	0.97	0.78-1.19	97	61.78	0.08	1.09	0.88-1.35	92	46.94	-0.19	0.83	0.65-1.07
Toilet facility	**No**	147	70	46.67	0.11	1.17	0.91-1.38	76	48.41	0.28	1.33*	1.07-1.65	105	53.57	0.25	1.29*	1.00-1.65
	Yes ®	93	106	70.67	-	-	-	115	73.25	-	-	-	95	48.47	-	-	-
Electricity	**No**	101	114	76.00	0.28	1.33*	1.04-1.71	124	78.98	0.53	1.70**	1.30-2.22	103	52.55	0.47	1.61**	1.21-2.13
	Yes ®	139	62	41.33	-	-	-	67	42.68	-	-	-	97	49.49	-	-	-
Mother occupation	**Housewife ®**	187	53	35.33	-	-	-	53	33.76	-	-	-	53	27.04	-	-	-
	Manual worker	53	123	82.00	-0.03	0.97	0.79-1.20	138	87.90	0.22	1.25	1.00-1.55	147	75.00	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	144	73	48.67	0.07	1.07	0.83-1.38	79	50.32	0.31	1.37*	1.06-1.77	73	37.24	0.17	1.19	0.87-1.63
	Others ®	96	103	68.67	-	-	-	112	71.34	-	-	-	127	64.80	-	-	-
Income	**≤ Rs. 2000**	107	30	20.00	0.21	1.23	0.87-1.75	35	22.29	0.10	1.11	0.78-1.59	65	33.16	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	83	55.33	0.03	1.03	0.78-1.35	83	52.87	0.21	1.24	0.94-1.64	83	42.35	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	87	58.00	-	-	-	73	46.50	-	-	-	52	26.53	-	-	-

Table 3.30: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Control Group)

Variable		N (230)	Stunting					Underweight					Wasting				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	118	104	62.28	-	-	-	94	59.87	-	-	-	101	61.59	-	-	-
	Girls	112	63	37.72	0.05	1.02	0.83-1.25	63	40.13	0.15	1.27*	1.03-1.58	63	38.41	0.41	1.50**	1.28-2.14
Age (in months)	**12-23**	25	33	19.76	0.61	1.85**	1.29-2.63	23	14.65	0.52	1.69**	1.18-2.42	30	18.29	0.30	1.35	0.87-2.07
	24-35	49	22	13.17	0.29	1.33	0.94-1.89	22	14.01	0.43	1.54*	1.08-2.19	22	13.41	0.48	1.61*	1.06-2.45
	36-47 ®	63	29	17.37	-	-	-	29	18.47	-	-	-	29	17.68	-	-	-
	48-59	50	53	31.74	0.51	1.84**	1.30-2.61	53	33.76	0.53	1.71**	1.20-2.43	53	32.32	0.12	1.13	0.73-1.75
	60	43	30	17.96	0.41	1.51*	1.09-2.07	30	19.11	0.31	1.37	0.99-1.88	30	18.29	0.26	1.30	0.87-1.92
Birth order	**1 ®**	101	33	19.76	-	-	-	23	14.65	-	-	-	30	18.29	-	-	-
	2	73	78	46.71	0.14	1.14	0.89-1.47	78	49.68	0.01	1.01	0.78-1.30	78	47.56	0.33	1.39*	1.03-1.88
	3≥	56	56	33.53	0.10	1.10	0.85-1.43	56	35.67	0.08	1.09	0.83-1.41	56	34.15	0.15	1.17	0.84-1.60
Water facilities	**Yes**	129	68	40.72	-0.16	0.85	0.65-1.12	68	43.31	0.12	1.13	0.85-1.49	60	36.59	0.29	1.34	0.94-1.89
	No ®	101	99	59.28	-	-	-	89	56.69	-	-	-	104	63.41	-	-	-
Mothers age at child birth	**≤ 18 years**	127	71	42.51	0.11	1.12	0.89-1.41	71	45.22	0.22	1.24	0.98-1.58	63	38.41	0.08	1.08	0.81-1.43
	≥19 years ®	103	110	65.87	-	-	-	120	76.43	-	-	-	105	64.02	-	-	-
Birth interval	**< 24 months ®**	130	78	46.71	-	-	-	88	56.05	-	-	-	71	43.29	-	-	-
	≥ 24 months	100	103	61.68	-0.03	0.97	0.78-1.20	103	65.61	-0.11	0.90	0.72-1.12	97	59.15	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	138	86	51.50	-	-	-	96	61.15	-	-	-	81	49.39	-	-	-
	Primary ≥	92	95	56.89	0.11	1.12	0.91-1.38	95	60.51	-0.26	0.77*	0.62-0.95	87	53.05	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	137	74	44.31	-	-	-	74	47.13	-	-	-	61	37.20	-	-	-
	Primary ≥	93	107	64.07	0.26	1.30*	1.04-1.62	117	74.52	0.07	1.07	0.86-1.35	146	89.02	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	131	73	43.71	-	-	-	73	46.50	-	-	-	65	39.63		-	-
	Pucca	99	108	64.67	-0.08	0.92	0.75-1.14	118	75.16	0.23	1.25*	1.01-1.55	103	62.80	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	120	64	38.32	-	-	-	64	40.76	-	-	-	56	34.15	-	-	-
	Not regularly	110	117	70.06	0.04	1.04	0.84-1.28	127	80.89	0.40	1.50**	1.20-1.86	112	68.29	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	131	67	40.12	-	-	-	67	42.68	-	-	-	67	40.85	-	-	-
	3 ≥	99	106	63.47	-0.01	0.99	0.80-1.22	116	73.89	0.20	1.22	0.98-1.51	101	61.59	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	138	84	50.30	-	-	-	94	59.87	-	-	-	75	45.73	-	-	-
	5 ≥	92	97	58.08	-0.04	0.97	0.78-1.19	97	61.78	0.08	1.09	0.88-1.35	93	56.71	-0.19	0.83	0.65-1.07
Toilet facility	**No**	137	76	45.51	0.11	1.17	0.91-1.38	76	48.41	0.28	1.33*	1.07-1.65	72	43.90	0.25	1.29*	1.00-1.65
	Yes ®	93	105	62.87	-	-	-	115	73.25	-	-	-	96	58.54	-	-	-
Electricity	**No**	101	114	68.26	0.28	1.33*	1.04-1.71	124	78.98	0.53	1.70**	1.30-2.22	109	66.46	0.47	1.61**	1.21-2.13
	Yes ®	129	67	40.12	-	-	-	67	42.68	-	-	-	59	35.98	-	-	-
Mother occupation	**Housewife ®**	53	53	31.74	-	-	-	53	33.76	-	-	-	45	27.44	-	-	-
	Manual worker	177	128	76.65	-0.03	0.97	0.79-1.20	138	87.90	0.22	1.25	1.00-1.55	123	75.00	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	73	79	47.31	0.07	1.07	0.83-1.38	79	50.32	0.31	1.37*	1.06-1.77	76	46.34	0.17	1.19	0.87-1.63
	Others ®	157	102	61.08	-	-	-	112	71.34	-	-	-	92	56.10	-	-	-
Income	**≤ Rs. 2000**	97	35	20.96	0.21	1.23	0.87-1.75	35	22.29	0.10	1.11	0.78-1.59	35	21.34	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	83	49.70	0.03	1.03	0.78-1.35	83	52.87	0.21	1.24	0.94-1.64	75	45.73	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	63	37.72	-	-	-	73	46.50	-	-	-	58	35.37	-	-	-

Table 3.31: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Control Group)

Variable		N (201)	Stunting					Underweight					Wasting				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	97	98	60.87	-	-	-	113	64.20	-	-	-	94	59.87	-	-	-
	Girls	104	63	39.13	0.16	1.02	0.83-1.25	63	35.80	0.13	1.28*	1.03-1.58	63	40.13	0.51	1.51**	1.28-2.14
Age (in months)	**12-23**	26	32	19.88	0.61	1.85**	1.29-2.63	47	26.70	0.52	1.69**	1.18-2.42	23	14.65	0.30	1.35	0.87-2.07
	24-35	42	22	13.66	0.21	1.33	0.94-1.89	22	12.50	0.43	1.54*	1.08-2.19	22	14.01	0.48	1.61*	1.06-2.45
	36-47 ®	53	24	14.91	-	-	-	24	13.64	-	-	-	29	18.47	-	-	-
	48-59	48	53	32.92	0.61	1.84**	1.30-2.61	53	30.11	0.53	1.71**	1.20-2.43	53	33.76	0.12	1.13	0.73-1.75
	60	32	30	18.63	0.41	1.51*	1.09-2.07	30	17.05	0.31	1.37	0.99-1.88	30	19.11	0.26	1.30	0.87-1.92
Birth order	**1 ®**	72	32	19.88	-	-	-	47	26.70	-	-	-	23	14.65	-	-	-
	2	73	73	45.34	0.14	1.14	0.89-1.47	73	41.48	0.01	1.01	0.78-1.30	78	49.68	0.33	1.39*	1.03-1.88
	3≥	56	56	34.78	0.10	1.10	0.85-1.43	56	31.82	0.08	1.09	0.83-1.41	56	35.67	0.15	1.17	0.84-1.60
Water facilities	**Yes**	100	62	38.51	-0.16	0.85	0.65-1.12	97	55.11	0.12	1.13	0.85-1.49	68	43.31	0.29	1.34	0.94-1.89
	No ®	101	99	61.49	-	-	-	79	44.89	-	-	-	89	56.69	-	-	-
Mothers age at child birth	**≤ 18 years**	98	60	37.27	0.11	1.12	0.89-1.41	95	53.98	0.22	1.24	0.98-1.58	71	45.22	0.08	1.08	0.81-1.43
	≥19 years ®	103	105	65.22	-	-	-	125	71.02	-	-	-	120	76.43	-	-	-
Birth interval	**< 24 months ®**	101	65	40.37	-	-	-	120	68.18	-	-	-	88	56.05	-	-	-
	≥ 24 months	100	100	62.11	-0.03	0.97	0.78-1.20	100	56.82	-0.11	0.90	0.72-1.12	103	65.61	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	109	73	45.34	-	-	-	128	72.73	-	-	-	96	61.15	-	-	-
	Primary ≥	92	92	57.14	0.11	1.12	0.91-1.38	92	52.27	-0.26	0.77*	0.62-0.95	95	60.51	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	108	70	43.48	-	-	-	105	59.66	-	-	-	74	47.13	-	-	-
	Primary ≥	93	95	59.01	0.26	1.30*	1.04-1.62	115	65.34	0.07	1.07	0.86-1.35	117	74.52	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	102	64	39.75	-	-	-	99	56.25	-	-	-	73	46.50		-	-
	Pucca	99	101	62.73	-0.08	0.92	0.75-1.14	121	68.75	0.23	1.25*	1.01-1.55	118	75.16	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	91	53	32.92	-	-	-	88	50.00	-	-	-	64	40.76	-	-	-
	Not regularly	110	112	69.57	0.04	1.04	0.84-1.28	132	75.00	0.40	1.50**	1.20-1.86	127	80.89	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	102	62	38.51	-	-	-	99	56.25	-	-	-	67	42.68	-	-	-
	3 ≥	99	101	62.73	-0.01	0.99	0.80-1.22	121	68.75	0.20	1.22	0.98-1.51	116	73.89	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	109	73	45.34	-	-	-	128	72.73	-	-	-	94	59.87	-	-	-
	5 ≥	92	92	57.14	-0.04	0.97	0.78-1.19	92	52.27	0.08	1.09	0.88-1.35	97	61.78	-0.19	0.83	0.65-1.07
Toilet facility	**No**	108	70	43.48	0.11	1.17	0.91-1.38	105	59.66	0.28	1.33*	1.07-1.65	76	48.41	0.25	1.29*	1.00-1.65
	Yes ®	93	95	59.01	-	-	-	115	65.34	-	-	-	115	73.25	-	-	-
Electricity	**No**	101	103	63.98	0.28	1.33*	1.04-1.71	123	69.89	0.53	1.70**	1.30-2.22	124	78.98	0.47	1.61**	1.21-2.13
	Yes ®	100	62	38.51	-	-	-	97	55.11	-	-	-	67	42.68	-	-	-
Mother occupation	**Housewife ®**	133	53	32.92	-	-	-	53	30.11	-	-	-	53	33.76	-	-	-
	Manual worker	68	112	69.57	-0.03	0.97	0.79-1.20	167	94.89	0.22	1.25	1.00-1.55	138	87.90	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	73	73	45.34	0.07	1.07	0.83-1.38	73	41.48	0.31	1.37*	1.06-1.77	79	50.32	0.17	1.19	0.87-1.63
	Others ®	128	92	57.14	-	-	-	147	83.52	-	-	-	112	71.34	-	-	-
Income	**≤ Rs. 2000**	68	30	18.63	0.21	1.23	0.87-1.75	65	36.93	0.10	1.11	0.78-1.59	35	22.29	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	83	51.55	0.03	1.03	0.78-1.35	83	47.16	0.21	1.24	0.94-1.64	83	52.87	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	52	32.30	-	-	-	72	40.91	-	-	-	73	46.50	-	-	-

Table 3.32: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on Thinness) (Case Group)

Variable		N	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
		(315)	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	164	104	62.28	-	-	-	68	51.91	-	-	-	95	60.13	-	-	-
	Girls	151	63	37.72	0.12	1.02	0.83-1.25	63	48.09	0.75	1.28*	1.03-1.58	63	39.87	0.21	1.59**	1.28-2.14
Age (in months)	**12-23**	44	33	19.76	0.11	1.85**	1.29-2.63	-3	-2.29	0.52	1.69**	1.18-2.42	29	18.35	0.30	1.35	0.87-2.07
	24-35	85	22	13.17	0.29	1.33	0.94-1.89	22	16.79	0.43	1.54*	1.08-2.19	22	13.92	0.48	1.61*	1.06-2.45
	36-47 ®	68	29	17.37	-	-	-	29	22.14	-	-	-	24	15.19	-	-	-
	48-59	54	53	31.74	0.61	1.84**	1.30-2.61	53	40.46	0.53	1.71**	1.20-2.43	53	33.54	0.12	1.13	0.73-1.75
	60	65	30	17.96	0.41	1.51*	1.09-2.07	30	22.90	0.31	1.37	0.99-1.88	30	18.99	0.26	1.30	0.87-1.92
Birth order	**1 ®**	135	33	19.76	-	-	-	-3	-2.29	-	-	-	29	18.35	-	-	-
	2	117	78	46.71	0.14	1.14	0.89-1.47	78	59.54	0.01	1.01	0.78-1.30	73	46.20	0.33	1.39*	1.03-1.88
	3≥	63	56	33.53	0.10	1.10	0.85-1.43	56	42.75	0.08	1.09	0.83-1.41	56	35.44	0.15	1.17	0.84-1.60
Water facilities	**Yes**	154	68	40.72	-0.16	0.85	0.65-1.12	68	51.91	0.12	1.13	0.85-1.49	97	61.39	0.29	1.34	0.94-1.89
	No ®	161	99	59.28	-	-	-	63	48.09	-	-	-	61	38.61	-	-	-
Mothers age at child birth	**≤ 18 years**	198	71	42.51	0.01	1.12	0.89-1.41	71	54.20	0.22	1.24	0.98-1.58	95	60.13	0.08	1.08	0.81-1.43
	≥19 years ®	117	110	65.87	-	-	-	146	111.45	-	-	-	143	90.51	-	-	-
Birth interval	**< 24 months ®**	165	78	46.71	-	-	-	114	87.02	-	-	-	138	87.34	-	-	-
	≥ 24 months	150	103	61.68	-0.03	0.97	0.78-1.20	103	78.63	-0.11	0.90	0.72-1.12	100	63.29	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	190	86	51.50	-	-	-	122	93.13	-	-	-	146	92.41	-	-	-
	Primary ≥	125	95	56.89	0.2	1.12	0.91-1.38	95	72.52	-0.26	0.77*	0.62-0.95	92	58.23	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	121	74	44.31	-	-	-	74	56.49	-	-	-	105	66.46	-	-	-
	Primary ≥	194	107	64.07	0.26	1.30*	1.04-1.62	143	109.16	0.07	1.07	0.86-1.35	133	84.18	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	176	73	43.71	-	-	-	73	55.73	-	-	-	99	62.66		-	-
	Pucca	139	108	64.67	-0.08	0.92	0.75-1.14	144	109.92	0.23	1.25*	1.01-1.55	139	87.97	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	149	64	38.32	-	-	-	64	48.85	-	-	-	88	55.70	-	-	-
	Not regularly	166	117	70.06	0.04	1.04	0.84-1.28	153	116.79	0.40	1.50**	1.20-1.86	150	94.94	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	198	67	40.12	-	-	-	67	51.15	-	-	-	99	62.66	-	-	-
	3 ≥	117	106	63.47	-0.01	0.99	0.80-1.22	142	108.40	0.20	1.22	0.98-1.51	139	87.97	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	140	84	50.30	-	-	-	120	91.60	-	-	-	146	92.41	-	-	-
	5 ≥	175	97	58.08	-0.04	0.97	0.78-1.19	97	74.05	0.08	1.09	0.88-1.35	92	58.23	-0.19	0.83	0.65-1.07
Toilet facility	**No**	165	76	45.51	0.11	1.17	0.91-1.38	76	58.02	0.28	1.33*	1.07-1.65	105	66.46	0.25	1.29*	1.00-1.65
	Yes ®	150	105	62.87	-	-	-	141	107.63	-	-	-	133	84.18	-	-	-
Electricity	**No**	187	114	68.26	0.28	1.33*	1.04-1.71	150	114.50	0.53	1.70**	1.30-2.22	141	89.24	0.47	1.61**	1.21-2.13
	Yes ®	128	67	40.12	-	-	-	67	51.15	-	-	-	97	61.39	-	-	-
Mother occupation	**Housewife ®**	215	53	31.74	-	-	-	53	40.46	-	-	-	53	33.54	-	-	-
	Manual worker	100	128	76.65	-0.03	0.97	0.79-1.20	164	125.19	0.22	1.25	1.00-1.55	185	117.09	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	172	79	47.31	0.07	1.07	0.83-1.38	79	60.31	0.31	1.37*	1.06-1.77	73	46.20	0.17	1.19	0.87-1.63
	Others ®	143	102	61.08	-	-	-	138	105.34	-	-	-	165	104.43	-	-	-
Income	**≤ Rs. 2000**	70	35	20.96	0.21	1.23	0.87-1.75	35	26.72	0.10	1.11	0.78-1.59	65	41.14	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	83	49.70	0.03	1.03	0.78-1.35	83	63.36	0.21	1.24	0.94-1.64	83	52.53	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	174	63	37.72	-	-	-	99	75.57	-	-	-	90	56.96	-	-	-

Table 3.33: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on Thinness) (Case Group)

Variable		N (308)	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
			Frequency	B	Odds	95% CI		Frequency	B	Odds	95% CI		Frequency	B	Odds	95% CI	
Gender	**Boys ®**	101	98	60.87	-	-	-	55	46.61	-	-	-	87	58.00	-	-	-
	Girls	207	63	39.13	0.13	1.02	0.83-1.25	63	53.39	0.42	1.28*	1.03-1.58	63	42.00	0.41	1.63**	1.28-2.14
Age (in months)	**12-23**	58	27	16.77	0.51	1.85**	1.29-2.63	-16	-13.56	0.35	1.69**	1.18-2.42	21	14.00	0.32	1.35	0.87-2.07
	24-35	73	22	13.66	0.29	1.33	0.94-1.89	22	18.64	0.43	1.54*	1.08-2.19	22	14.67	0.48	1.61*	1.06-2.45
	36-47 ®	57	29	18.01	-	-	-	29	24.58	-	-	-	24	16.00	-	-	-
	48-59	64	53	32.92	0.61	1.84**	1.30-2.61	53	44.92	0.53	1.71**	1.20-2.43	53	35.33	0.12	1.13	0.73-1.75
	60	56	30	18.63	0.41	1.51*	1.09-2.07	30	25.42	0.31	1.37	0.99-1.88	30	20.00	0.26	1.30	0.87-1.92
Birth order	**1 ®**	128	27	16.77	-	-	-	-16	-13.56	-	-	-	21	14.00	-	-	-
	2	117	78	48.45	0.14	1.14	0.89-1.47	78	66.10	0.01	1.01	0.78-1.30	73	48.67	0.33	1.39*	1.03-1.88
	3≥	63	56	34.78	0.10	1.10	0.85-1.43	56	47.46	0.08	1.09	0.83-1.41	56	37.33	0.15	1.17	0.84-1.60
Water facilities	**Yes**	150	68	42.24	-0.16	0.85	0.65-1.12	68	57.63	0.12	1.13	0.85-1.49	62	41.33	0.29	1.34	0.94-1.89
	No ®	158	93	57.76	-	-	-	50	42.37	-	-	-	88	58.67	-	-	-
Mothers age at child birth	**≤ 18 years**	190	71	44.10	0.11	1.12	0.89-1.41	71	60.17	0.22	1.24	0.98-1.58	60	40.00	0.08	1.08	0.81-1.43
	≥19 years ®	118	116	72.05	-	-	-	159	134.75	-	-	-	116	77.33	-	-	-
Birth interval	**< 24 months ®**	155	84	52.17	-	-	-	127	107.63	-	-	-	76	50.67	-	-	-
	≥ 24 months	153	103	63.98	-0.03	0.97	0.78-1.20	103	87.29	-0.11	0.90	0.72-1.12	100	66.67	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	198	92	57.14	-	-	-	135	114.41	-	-	-	84	56	-	-	-
	Primary ≥	110	95	59.01	0.11	1.12	0.91-1.38	95	80.51	-0.26	0.77*	0.62-0.95	92	61.33	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	121	74	45.96	-	-	-	74	62.71	-	-	-	70	46.67	-	-	-
	Primary ≥	187	113	70.19	0.26	1.30*	1.04-1.62	156	132.20	0.07	1.07	0.86-1.35	106	70.67	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha @**	172	73	45.34	-	-	-	73	61.86	-	-	-	64	42.67		-	-
	Pucca	136	114	70.81	-0.08	0.92	0.75-1.14	157	133.05	0.23	1.25*	1.01-1.55	112	74.67	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	141	64	39.75	-	-	-	64	54.24	-	-	-	53	35.33	-	-	-
	Not regularly	167	123	76.40	0.04	1.04	0.84-1.28	166	140.68	0.40	1.50**	1.20-1.86	123	82	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	190	67	41.61	-	-	-	67	56.78	-	-	-	62	41.33	-	-	-
	3 ≥	116	112	69.57	-0.01	0.99	0.80-1.22	155	131.36	0.20	1.22	0.98-1.51	112	74.67	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	136	90	55.90	-	-	-	133	112.71	-	-	-	84	56.00	-	-	-
	5 ≥	172	97	60.25	-0.04	0.97	0.78-1.19	97	82.20	0.08	1.09	0.88-1.35	92	61.33	-0.19	0.83	0.65-1.07
Toilet facility	**No**	161	76	47.20	0.11	1.17	0.91-1.38	76	64.41	0.28	1.33*	1.07-1.65	70	46.67	0.25	1.29*	1.00-1.65
	Yes ®	147	111	68.94	-	-	-	154	130.51	-	-	-	106	70.67	-	-	-
Electricity	**No**	183	120	74.53	0.28	1.33*	1.04-1.71	163	138.14	0.53	1.70**	1.30-2.22	114	76.00	0.47	1.61**	1.21-2.13
	Yes ®	125	67	41.61	-	-	-	67	56.78	-	-	-	62	41.33	-	-	-
Mother occupation	**Housewife ®**	210	53	32.92	-	-	-	53	44.92	-	-	-	53	35.33	-	-	-
	Manual worker	98	134	83.23	-0.03	0.97	0.79-1.20	177	150.00	0.22	1.25	1.00-1.55	123	82.00	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	168	79	49.07	0.07	1.07	0.83-1.38	79	66.95	0.31	1.37*	1.06-1.77	73	48.67	0.17	1.19	0.87-1.63
	Others ®	140	108	67.08	-	-	-	151	127.97	-	-	-	103	68.67	-	-	-
Income	**≤ Rs. 2000**	170	35	21.74	0.21	1.23	0.87-1.75	35	29.66	0.10	1.11	0.78-1.59	30	20.00	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	83	51.55	0.03	1.03	0.78-1.35	83	70.34	0.21	1.24	0.94-1.64	83	55.33	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	69	42.86	-	-	-	112	94.92	-	-	-	63	42	-	-	-

Table 3.34: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children(Based on Thinness) (Case Group)

Variable		N (297)	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	157	73	53.68	-	-	-	113	64.20	-	-	-	87	58.00	-	-	-
	Girls	141	63	46.32	0.19	1.02	0.83-1.25	63	35.80	0.78	1.84	1.03-1.58	63	42.00	0.27	1.1	1.28-2.14
Age (in months)	**12-23**	36	7	5.15	0.78	1.85	1.29-2.63	47	26.70	0.58	1.51	1.18-2.42	21	14.00	0.01	0.85	0.87-2.07
	24-35	67	22	16.18	0.46	1.33	0.94-1.89	22	12.50	0.31	1.14	1.08-2.19	22	14.67	0.28	1.12	1.06-2.45
	36-47 ®	64	24	17.65	-	-	-	24	13.64	-	-	-	24	16.00	-	-	-
	48-59	66	53	38.97	0.61	1.84**	1.30-2.61	53	30.11	0.53	1.71**	1.20-2.43	53	35.33	0.12	1.13	0.73-1.75
	60	64	30	22.06	0.41	1.51*	1.09-2.07	30	17.05	0.31	1.37	0.99-1.88	30	20.00	0.26	1.30	0.87-1.92
Birth order	**1 ®**	123	7	5.15	-	-	-	47	26.70	-	-	-	21	14.00	-	-	-
	2	112	73	53.68	0.14	1.14	0.89-1.47	73	41.48	0.01	1.01	0.78-1.30	73	48.67	0.33	1.39*	1.03-1.88
	3≥	62	56	41.18	0.10	1.10	0.85-1.43	56	31.82	0.08	1.09	0.83-1.41	56	37.33	0.15	1.17	0.84-1.60
Water facilities	**Yes**	145	97	71.32	-0.16	0.85	0.65-1.12	97	55.11	0.12	1.13	0.85-1.49	62	41.33	0.29	1.34	0.94-1.89
	No ®	152	39	28.68	-	-	-	79	44.89	-	-	-	88	58.67	-	-	-
Mothers age at child birth	**≤ 18 years**	190	95	69.85	0.11	1.12	0.89-1.41	95	53.98	0.22	1.24	0.98-1.58	60	40.00	0.08	1.08	0.81-1.43
	≥19 years ®	107	165	121.32	-	-	-	125	71.02	-	-	-	116	77.33	-	-	-
Birth interval	**< 24 months ®**	150	160	117.65	-	-	-	120	68.18	-	-	-	76	50.67	-	-	-
	≥ 24 months	147	100	73.53	-0.03	0.97	0.78-1.20	100	56.82	-0.11	0.90	0.72-1.12	100	66.67	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	193	168	123.53	-	-	-	128	72.73	-	-	-	84	56	-	-	-
	Primary ≥	104	92	67.65	0.11	1.12	0.91-1.38	92	52.27	-0.26	0.77*	0.62-0.95	92	61.33	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	110	105	77.21	-	-	-	105	59.66	-	-	-	70	46.67	-	-	-
	Primary ≥	187	155	113.97	0.26	1.30*	1.04-1.62	115	65.34	0.07	1.07	0.86-1.35	106	70.67	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	172	99	72.79	-	-	-	99	56.25	-	-	-	64	42.67		-	-
	Pucca®	125	161	118.38	-0.08	0.92	0.75-1.14	121	68.75	0.23	1.25*	1.01-1.55	112	74.67	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	130	88	64.71	-	-	-	88	50.00	-	-	-	53	35.33	-	-	-
	Not regularly	167	172	126.47	0.04	1.04	0.84-1.28	132	75.00	0.40	1.50**	1.20-1.86	123	82	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	179	99	72.79	-	-	-	99	56.25	-	-	-	62	41.33	-	-	-
	3 ≥	118	161	118.38	-0.01	0.99	0.80-1.22	121	68.75	0.20	1.22	0.98-1.51	112	74.67	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	125	168	123.53	-	-	-	128	72.73	-	-	-	84	56.00	-	-	-
	5 ≥	172	92	67.65	-0.04	0.97	0.78-1.19	92	52.27	0.08	1.09	0.88-1.35	92	61.33	-0.19	0.83	0.65-1.07
Toilet facility	**No**	150	105	77.21	0.11	1.17	0.91-1.38	105	59.66	0.28	1.33*	1.07-1.65	70	46.67	0.25	1.29*	1.00-1.65
	Yes ®	147	155	113.97	-	-	-	115	65.34	-	-	-	106	70.67	-	-	-
Electricity	**No**	172	163	119.85	0.28	1.33*	1.04-1.71	123	69.89	0.53	1.70**	1.30-2.22	114	76.00	0.47	1.61**	1.21-2.13
	Yes ®	125	97	71.32	-	-	-	97	55.11	-	-	-	62	41.33	-	-	-
Mother occupation	**Housewife ®**	199	53	38.97	-	-	-	53	30.11	-	-	-	53	35.33	-	-	-
	Manual worker	98	207	152.21	-0.03	0.97	0.79-1.20	167	94.89	0.22	1.25	1.00-1.55	123	82.00	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	157	73	53.68	0.07	1.07	0.83-1.38	73	41.48	0.31	1.37*	1.06-1.77	73	48.67	0.17	1.19	0.87-1.63
	Others ®	140	187	137.50	-	-	-	147	83.52	-	-	-	103	68.67	-	-	-
Income	**≤ Rs. 2000**	159	65	47.79	0.21	1.23	0.87-1.75	65	36.93	0.10	1.11	0.78-1.59	30	20.00	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	83	61.03	0.03	1.03	0.78-1.35	83	47.16	0.21	1.24	0.94-1.64	83	55.33	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	112	82.35	-	-	-	72	40.91	-	-	-	87	58.00	-	-	-

Table 3.35: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children(Based on Thinness) (Case Group)

Variable		N	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
		(284)	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	143	87	58.00	-	-	-	73	53.68	-	-	-	113	64.20	-	-	-
	Girls	141	63	42.00	0.02	1.02	0.83-1.25	63	46.32	0.25	1.28*	1.03-1.58	63	35.80	0.51	1.62**	1.28-2.14
Age (in months)	**12-23**	38	21	14.00	0.61	1.85**	1.29-2.63	7	5.15	0.52	1.69**	1.18-2.42	47	26.70	0.30	1.35	0.87-2.07
	24-35	49	22	14.67	0.29	1.33	0.94-1.89	22	16.18	0.43	1.54*	1.08-2.19	22	12.50	0.48	1.61*	1.06-2.45
	36-47 ®	59	24	16.00	-	-	-	24	17.65	-	-	-	24	13.64	-	-	-
	48-59	64	53	35.33	0.61	1.84**	1.30-2.61	53	38.97	0.53	1.71**	1.20-2.43	53	30.11	0.12	1.13	0.73-1.75
	60	74	30	20.00	0.41	1.51*	1.09-2.07	30	22.06	0.31	1.37	0.99-1.88	30	17.05	0.26	1.30	0.87-1.92
Birth order	**1 ®**	115	21	14.00	-	-	-	7	5.15	-	-	-	47	26.70	-	-	-
	2	107	73	48.67	0.14	1.14	0.89-1.47	73	53.68	0.01	1.01	0.78-1.30	73	41.48	0.33	1.39*	1.03-1.88
	3≥	62	56	37.33	0.10	1.10	0.85-1.43	56	41.18	0.08	1.09	0.83-1.41	56	31.82	0.15	1.17	0.84-1.60
Water facilities	**Yes**	132	62	41.33	-0.16	0.85	0.65-1.12	97	71.32	0.12	1.13	0.85-1.49	97	55.11	0.29	1.34	0.94-1.89
	No ®	152	88	58.67	-	-	-	39	28.68	-	-	-	79	44.89	-	-	-
Mothers age at child birth	**≤ 18 years**	180	60	40.00	0.11	1.12	0.89-1.41	95	69.85	0.22	1.24	0.98-1.58	95	53.98	0.08	1.08	0.81-1.43
	≥19 years ®	104	116	77.33	-	-	-	165	121.32	-	-	-	125	71.02	-	-	-
Birth interval	**< 24 months ®**	142	76	50.67	-	-	-	160	117.65	-	-	-	120	68.18	-	-	-
	≥ 24 months	142	100	66.67	-0.03	0.97	0.78-1.20	100	73.53	-0.11	0.90	0.72-1.12	100	56.82	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	180	84	56	-	-	-	168	123.53	-	-	-	128	72.73	-	-	-
	Primary ≥	104	92	61.33	0.11	1.12	0.91-1.38	92	67.65	-0.26	0.77*	0.62-0.95	92	52.27	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	97	70	46.67	-	-	-	105	77.21	-	-	-	105	59.66	-	-	-
	Primary ≥	187	106	70.67	0.26	1.30*	1.04-1.62	155	113.97	0.07	1.07	0.86-1.35	115	65.34	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	159	64	42.67	-	-	-	99	72.79	-	-	-	99	56.25		-	-
	Pucca®	125	112	74.67	-0.08	0.92	0.75-1.14	161	118.38	0.23	1.25*	1.01-1.55	121	68.75	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	117	53	35.33	-	-	-	88	64.71	-	-	-	88	50.00	-	-	-
	Not regularly	167	123	82	0.04	1.04	0.84-1.28	172	126.47	0.40	1.50**	1.20-1.86	132	75.00	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	166	62	41.33	-	-	-	99	72.79	-	-	-	99	56.25	-	-	-
	3 ≥	118	112	74.67	-0.01	0.99	0.80-1.22	161	118.38	0.20	1.22	0.98-1.51	121	68.75	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	112	84	56.00	-	-	-	168	123.53	-	-	-	128	72.73	-	-	-
	5 ≥	172	92	61.33	-0.04	0.97	0.78-1.19	92	67.65	0.08	1.09	0.88-1.35	92	52.27	-0.19	0.83	0.65-1.07
Toilet facility	**No**	137	70	46.67	0.11	1.17	0.91-1.38	105	77.21	0.28	1.33*	1.07-1.65	105	59.66	0.25	1.29*	1.00-1.65
	Yes ®	147	106	70.67	-	-	-	155	113.97	-	-	-	115	65.34	-	-	-
Electricity	**No**	159	114	76.00	0.28	1.33*	1.04-1.71	163	119.85	0.53	1.70**	1.30-2.22	123	69.89	0.47	1.61**	1.21-2.13
	Yes ®	125	62	41.33	-	-	-	97	71.32	-	-	-	97	55.11	-	-	-
Mother occupation	**Housewife ®**	186	53	35.33	-	-	-	53	38.97	-	-	-	53	30.11	-	-	-
	Manual worker	98	123	82.00	-0.03	0.97	0.79-1.20	207	152.21	0.22	1.25	1.00-1.55	167	94.89	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	144	73	48.67	0.07	1.07	0.83-1.38	73	53.68	0.31	1.37*	1.06-1.77	73	41.48	0.17	1.19	0.87-1.63
	Others ®	140	103	68.67	-	-	-	187	137.50	-	-	-	147	83.52	-	-	-
Income	**≤ Rs. 2000**	146	30	20.00	0.21	1.23	0.87-1.75	65	47.79	0.10	1.11	0.78-1.59	65	36.93	0.27	1.31	0.86-2.00
	Rs.2001-4000	71	83	55.33	0.03	1.03	0.78-1.35	83	61.03	0.21	1.24	0.94-1.64	83	47.16	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	67	87	58.00	-	-	-	112	82.35	-	-	-	72	40.91	-	-	-

Table 3.36: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children(Based on Thinness) (Case Group)

Variable		N	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
		(319)	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	Boys ®	164	113	64.20	-	-	-	73	53.68	-	-	-	95	60.13	-	-	-
	Girls	155	63	35.80	0.13	1.02	0.83-1.25	63	46.32	0.23	1.28*	1.03-1.58	63	39.87	0.21	1.63**	1.28-2.14
Age (in months)	12-23	55	47	26.70	0.24	1.85**	1.29-2.63	7	5.15	0.31	1.69**	1.18-2.42	29	18.35	0.40	1.35	0.87-2.07
	24-35	81	22	12.50	0.38	1.33	0.94-1.89	22	16.18	0.43	1.54*	1.08-2.19	22	13.92	0.28	1.61*	1.06-2.45
	36-47 ®	68	24	13.64	-	-	-	24	17.65	-	-	-	24	15.19	-	-	-
	48-59	50	53	30.11	0.61	1.84**	1.30-2.61	53	38.97	0.53	1.71**	1.20-2.43	53	33.54	0.12	1.13	0.73-1.75
	60	65	30	17.05	0.41	1.51*	1.09-2.07	30	22.06	0.31	1.37	0.99-1.88	30	18.99	0.26	1.30	0.87-1.92
Birth order	1 ®	150	47	26.70	-	-	-	7	5.15	-	-	-	29	18.35	-	-	-
	2	107	73	41.48	0.14	1.14	0.89-1.47	73	53.68	0.01	1.01	0.78-1.30	73	46.20	0.33	1.39*	1.03-1.88
	3≥	62	56	31.82	0.10	1.10	0.85-1.43	56	41.18	0.08	1.09	0.83-1.41	56	35.44	0.15	1.17	0.84-1.60
Water facilities	Yes	167	97	55.11	-0.16	0.85	0.65-1.12	97	71.32	0.12	1.13	0.85-1.49	97	61.39	0.29	1.34	0.94-1.89
	No ®	152	79	44.89	-	-	-	39	28.68	-	-	-	61	38.61	-	-	-
Mothers age at child birth	≤ 18 years	215	95	53.98	0.11	1.12	0.89-1.41	95	69.85	0.22	1.24	0.98-1.58	95	60.13	0.08	1.08	0.81-1.43
	≥19 years ®	104	125	71.02	-	-	-	165	121.32	-	-	-	143	90.51	-	-	-
Birth interval	< 24 months ®	177	120	68.18	-	-	-	160	117.65	-	-	-	138	87.34	-	-	-
	≥ 24 months	142	100	56.82	-0.03	0.97	0.78-1.20	100	73.53	-0.11	0.90	0.72-1.12	100	63.29	0.08	1.09	0.84-1.41
Mother education	Illiterate ®	215	128	72.73	-	-	-	168	123.53	-	-	-	146	92.41	-	-	-
	Primary ≥	104	92	52.27	0.11	1.12	0.91-1.38	92	67.65	-0.26	0.77*	0.62-0.95	92	58.23	-0.29	0.75*	0.58-0.96
Father education	Illiterate ®	132	105	59.66	-	-	-	105	77.21	-	-	-	105	66.46	-	-	-
	Primary ≥	187	115	65.34	0.26	1.30*	1.04-1.62	155	113.97	0.07	1.07	0.86-1.35	133	84.18	-0.02	0.98	0.75-1.28
House Pattern	Kaccha	194	99	56.25	-	-	-	99	72.79	-	-	-	99	62.66		-	-
	Pucca®	125	121	68.75	-0.08	0.92	0.75-1.14	161	118.38	0.23	1.25*	1.01-1.55	139	87.97	0.07	1.07	0.84-1.38
Media exposure	Regularly ®	152	88	50.00	-	-	-	88	64.71	-	-	-	88	55.70	-	-	-
	Not regularly	167	132	75.00	0.04	1.04	0.84-1.28	172	126.47	0.40	1.50**	1.20-1.86	150	94.94	0.32	1.38*	1.07-1.77
Siblings	1-2 ®	201	99	56.25	-	-	-	99	72.79	-	-	-	99	62.66	-	-	-
	3 ≥	118	121	68.75	-0.01	0.99	0.80-1.22	161	118.38	0.20	1.22	0.98-1.51	139	87.97	-0.15	0.86	0.67-1.11
Family size	≥ 4 ®	157	128	72.73	-	-	-	168	123.53	-	-	-	146	92.41	-	-	-
	5 ≥	162	92	52.27	-0.04	0.97	0.78-1.19	92	67.65	0.08	1.09	0.88-1.35	92	58.23	-0.19	0.83	0.65-1.07
Toilet facility	No	172	105	59.66	0.11	1.17	0.91-1.38	105	77.21	0.28	1.33*	1.07-1.65	105	66.46	0.25	1.29*	1.00-1.65
	Yes ®	147	115	65.34	-	-	-	155	113.97	-	-	-	133	84.18	-	-	-
Electricity	No	159	123	69.89	0.28	1.33*	1.04-1.71	163	119.85	0.53	1.70**	1.30-2.22	141	89.24	0.47	1.61**	1.21-2.13
	Yes ®	160	97	55.11	-	-	-	97	71.32	-	-	-	97	61.39	-	-	-
Mother occupation	Housewife ®	196	53	30.11	-	-	-	53	38.97	-	-	-	53	33.54	-	-	-
	Manual worker	133	167	94.89	-0.03	0.97	0.79-1.20	207	152.21	0.22	1.25	1.00-1.55	185	117.09	-0.05	0.95	0.74-1.23
Fathers occupation	Manual worker	144	73	41.48	0.07	1.07	0.83-1.38	73	53.68	0.31	1.37*	1.06-1.77	73	46.20	0.17	1.19	0.87-1.63
	Others ®	175	147	83.52	-	-	-	187	137.50	-	-	-	165	104.43	-	-	-
Income	≤ Rs. 2000	181	65	36.93	0.21	1.23	0.87-1.75	65	47.79	0.10	1.11	0.78-1.59	65	41.14	0.27	1.31	0.86-2.00
	Rs.2001-4000	87	83	47.16	0.03	1.03	0.78-1.35	83	61.03	0.21	1.24	0.94-1.64	83	52.53	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	51	72	40.91	-	-	-	112	82.35	-	-	-	90	56.96	-	-	-

Table 3.37: A: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on Thinness) (Control Group)

Variable		N (240)	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Sex	**Boys ®**	123	95	60.13	-	-	-	133	67.86	-	-	-	78	55.32	-	-	-
	Girls	117	63	39.87	0.59	1.3	0.83-1.25	63	32.14	0.29	0.97	1.03-1.58	63	44.68	0.3	0.97	1.28-2.14
Age (in months)	**12-23**	26	29	18.35	0.25	0.92	1.29-2.63	67	34.18	0.44	1.17	1.18-2.42	12	8.51	0.4	1.07	0.87-2.07
	24-35	48	22	13.92	0.37	1.04	0.94-1.89	22	11.22	0.61	1.33	1.08-2.19	22	15.60	0.54	1.23	1.06-2.45
	36-47 ®	63	24	15.19	-	-	-	24	12.24	-	-	-	24	17.02	-	-	-
	48-59	56	53	33.54	0.61	1.84**	1.30-2.61	53	27.04	0.53	1.71**	1.20-2.43	53	37.59	0.12	1.13	0.73-1.75
	60	47	30	18.99	0.41	1.51*	1.09-2.07	30	15.31	0.31	1.37	0.99-1.88	30	21.28	0.26	1.30	0.87-1.92
Birth order	**1 ®**	111	29	18.35	-	-	-	67	34.18	-	-	-	12	8.51	-	-	-
	2	73	73	46.20	0.14	1.14	0.89-1.47	73	37.24	0.01	1.01	0.78-1.30	73	51.77	0.33	1.39*	1.03-1.88
	3≥	56	56	35.44	0.10	1.10	0.85-1.43	56	28.57	0.08	1.09	0.83-1.41	56	39.72	0.15	1.17	0.84-1.60
Water facilities	**Yes**	139	97	61.39	-0.16	0.85	0.65-1.12	97	49.49	0.12	1.13	0.85-1.49	62	43.97	0.29	1.34	0.94-1.89
	No ®	101	61	38.61	-	-	-	99	50.51	-	-	-	79	56.03	-	-	-
Mothers age at child birth	**≤ 18 years**	137	95	60.13	0.11	1.12	0.89-1.41	95	48.47	0.22	1.24	0.98-1.58	60	42.55	0.08	1.08	0.81-1.43
	≥19 years ®	103	143	90.51	-	-	-	105	53.57	-	-	-	125	88.65	-	-	-
Birth interval	**< 24 months ®**	140	138	87.34	-	-	-	100	51.02	-	-	-	85	60.28	-	-	-
	≥ 24 months	100	100	63.29	-0.03	0.97	0.78-1.20	100	51.02	-0.11	0.90	0.72-1.12	100	70.92	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	148	146	92.41	-	-	-	108	55.10	-	-	-	93	65.96	-	-	-
	Primary ≥	92	92	58.23	0.11	1.12	0.91-1.38	92	46.94	-0.26	0.77*	0.62-0.95	92	65.25	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	147	105	66.46	-	-	-	105	53.57	-	-	-	70	49.65	-	-	-
	Primary ≥	93	133	84.18	0.26	1.30*	1.04-1.62	95	48.47	0.07	1.07	0.86-1.35	115	81.56	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	141	99	62.66	-	-	-	99	50.51	-	-	-	64	45.39		-	-
	Pucca®	99	139	87.97	-0.08	0.92	0.75-1.14	101	51.53	0.23	1.25*	1.01-1.55	121	85.82	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	130	88	55.70	-	-	-	88	44.90	-	-	-	53	37.59	-	-	-
	Not regularly	110	150	94.94	0.04	1.04	0.84-1.28	112	57.14	0.40	1.50**	1.20-1.86	132	93.62	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	141	99	62.66	-	-	-	99	50.51	-	-	-	62	43.97	-	-	-
	3 ≥	99	139	87.97	-0.01	0.99	0.80-1.22	101	51.53	0.20	1.22	0.98-1.51	121	85.82	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	148	146	92.41	-	-	-	108	55.10	-	-	-	93	65.96	-	-	-
	5 ≥	92	92	58.23	-0.04	0.97	0.78-1.19	92	46.94	0.08	1.09	0.88-1.35	92	65.25	-0.19	0.83	0.65-1.07
Toilet facility	**No**	147	105	66.46	0.11	1.17	0.91-1.38	105	53.57	0.28	1.33*	1.07-1.65	70	49.65	0.25	1.29*	1.00-1.65
	Yes ®	93	133	84.18	-	-	-	95	48.47	-	-	-	115	81.56	-	-	-
Electricity	**No**	101	141	89.24	0.28	1.33*	1.04-1.71	103	52.55	0.53	1.70**	1.30-2.22	123	87.23	0.47	1.61**	1.21-2.13
	Yes ®	139	97	61.39	-	-	-	97	49.49	-	-	-	62	43.97	-	-	-
Mother occupation	**Housewife ®**	187	53	33.54	-	-	-	53	27.04	-	-	-	53	37.59	-	-	-
	Manual worker	53	185	117.09	-0.03	0.97	0.79-1.20	147	75.00	0.22	1.25	1.00-1.55	132	93.62	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	144	73	46.20	0.07	1.07	0.83-1.38	73	37.24	0.31	1.37*	1.06-1.77	73	51.77	0.17	1.19	0.87-1.63
	Others ®	96	165	104.43	-	-	-	127	64.80	-	-	-	112	79.43	-	-	-
Income	**≤ Rs. 2000**	107	65	41.14	0.21	1.23	0.87-1.75	65	33.16	0.10	1.11	0.78-1.59	30	21.28	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	83	52.53	0.03	1.03	0.78-1.35	83	42.35	0.21	1.24	0.94-1.64	83	58.87	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	90	56.96	-	-	-	52	26.53	-	-	-	72	51.06	-	-	-

(p value *<0.05, **<0.001)

Table 3.38: effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on Thinness) (Control Group)

Variable		N (230)	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
			Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	118	92	63.45	-	-	-	109	63.37	-	-	-	98	60.87	-	-	-
	Girls	112	53	36.55	0.32	1.02	0.83-1.25	63	36.63	0.21	1.28*	1.03-1.58	63	39.13	0.14	1.56**	1.28-2.14
Age (in months)	**12-23**	25	21	14.48	0.41	1.85**	1.29-2.63	38	22.09	0.43	1.69**	1.18-2.42	32	19.88	0.09	1.35	0.87-2.07
	24-35	49	22	15.17	0.79	1.33	0.94-1.89	22	12.79	0.71	1.54*	1.08-2.19	22	13.66	0.01	1.61*	1.06-2.45
	36-47 ®	63	29	20.00	-	-	-	29	16.86	-	-	-	24	14.91	-	-	-
	48-59	50	53	36.55	0.61	1.84**	1.30-2.61	53	30.81	0.53	1.71**	1.20-2.43	53	32.92	0.12	1.13	0.73-1.75
	60	43	20	13.79	0.41	1.51*	1.09-2.07	30	17.44	0.31	1.37	0.99-1.88	30	18.63	0.26	1.30	0.87-1.92
Birth order	**1 ®**	101	21	14.48	-	-	-	38	22.09	-	-	-	32	19.88	-	-	-
	2	73	78	53.79	0.14	1.14	0.89-1.47	78	45.35	0.01	1.01	0.78-1.30	73	45.34	0.33	1.39*	1.03-1.88
	3≥	56	46	31.72	0.10	1.10	0.85-1.43	56	32.56	0.08	1.09	0.83-1.41	56	34.78	0.15	1.17	0.84-1.60
Water facilities	**Yes**	129	62	42.76	-0.16	0.85	0.65-1.12	68	39.53	0.12	1.13	0.85-1.49	62	38.51	0.29	1.34	0.94-1.89
	No ®	101	83	57.24	-	-	-	104	60.47	-	-	-	99	61.49	-	-	-
Mothers age at child birth	**≤ 18 years**	127	65	44.83	0.11	1.12	0.89-1.41	71	41.28	0.22	1.24	0.98-1.58	60	37.27	0.08	1.08	0.81-1.43
	≥19 years ®	103	106	73.10	-	-	-	105	61.05	-	-	-	105	65.22	-	-	-
Birth interval	**< 24 months ®**	130	84	57.93	-	-	-	73	42.44	-	-	-	65	40.37	-	-	-
	≥ 24 months	100	87	60.00	-0.03	0.97	0.78-1.20	103	59.88	-0.11	0.90	0.72-1.12	100	62.11	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	138	94	64.83	-	-	-	81	47.09	-	-	-	73	45.34	-	-	-
	Primary ≥	92	77	53.10	0.11	1.12	0.91-1.38	95	55.23	-0.26	0.77*	0.62-0.95	92	57.14	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	137	63	43.45	-	-	-	74	43.02	-	-	-	70	43.48	-	-	-
	Primary ≥	93	108	74.48	0.26	1.30*	1.04-1.62	102	59.30	0.07	1.07	0.86-1.35	95	59.01	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	131	68	46.90	-	-	-	73	42.44	-	-	-	64	39.75		-	-
	Pucca®	99	103	71.03	-0.08	0.92	0.75-1.14	103	59.88	0.23	1.25*	1.01-1.55	101	62.73	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	120	58	40.00	-	-	-	64	37.21	-	-	-	53	32.92	-	-	-
	Not regularly	110	113	77.93	0.04	1.04	0.84-1.28	112	65.12	0.40	1.50**	1.20-1.86	112	69.57	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	131	69	47.59	-	-	-	67	38.95	-	-	-	62	38.51	-	-	-
	3 ≥	99	102	70.34	-0.01	0.99	0.80-1.22	101	58.72	0.20	1.22	0.98-1.51	101	62.73	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	138	88	60.69	-	-	-	79	45.93	-	-	-	73	45.34	-	-	-
	5 ≥	92	83	57.24	-0.04	0.97	0.78-1.19	97	56.40	0.08	1.09	0.88-1.35	92	57.14	-0.19	0.83	0.65-1.07
Toilet facility	**No**	137	74	51.03	0.11	1.17	0.91-1.38	76	44.19	0.28	1.33*	1.07-1.65	70	43.48	0.25	1.29*	1.00-1.65
	Yes ®	93	97	66.90	-	-	-	100	58.14	-	-	-	95	59.01	-	-	-
Electricity	**No**	101	116	80.00	0.28	1.33*	1.04-1.71	109	63.37	0.53	1.70**	1.30-2.22	103	63.98	0.47	1.61**	1.21-2.13
	Yes ®	129	55	37.93	-	-	-	67	38.95	-	-	-	62	38.51	-	-	-
Mother occupation	**Housewife ®**	53	32	22.07	-	-	-	53	30.81	-	-	-	53	32.92	-	-	-
	Manual worker	177	139	95.86	-0.03	0.97	0.79-1.20	123	71.51	0.22	1.25	1.00-1.55	112	69.57	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	73	75	51.72	0.07	1.07	0.83-1.38	79	45.93	0.31	1.37*	1.06-1.77	73	45.34	0.17	1.19	0.87-1.63
	Others ®	157	96	66.21	-	-	-	97	56.40	-	-	-	92	57.14	-	-	-
Income	**≤ Rs. 2000**	97	28	19.31	0.21	1.23	0.87-1.75	35	20.35	0.10	1.11	0.78-1.59	30	18.63	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	75	51.72	0.03	1.03	0.78-1.35	83	48.26	0.21	1.24	0.94-1.64	83	51.55	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	68	46.90	-	-	-	58	33.72	-	-	-	52	32.30	-	-	-

Table 3.39: effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on Thinness)(Control Group)

Variable		N	Mild Thinness Grade I					Moderate Thinness Grade II					Severe Thinness Grade III				
		(201)	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI	Frequency		B	Odds	95% CI
Gender	**Boys ®**	97	83	56.85	-	-	-	95	60.13	-	-	-	78	55.32	-	-	-
	Girls	104	63	43.15	0.31	1.02	0.83-1.25	63	39.87	0.05	1.28*	1.03-1.58	63	44.68	0.40	1.46**	1.28-2.14
Age (in months)	**12-23**	26	12	8.22	0.52	1.85**	1.29-2.63	29	18.35	0.02	1.69**	1.18-2.42	12	8.51	0.26	1.35	0.87-2.07
	24-35	42	22	15.07	0.19	1.33	0.94-1.89	22	13.92	0.23	1.54*	1.08-2.19	22	15.60	0.18	1.61*	1.06-2.45
	36-47 ®	53	29	19.86	-	-	-	24	15.19	-	-	-	24	17.02	-	-	-
	48-59	48	53	36.30	0.61	1.84**	1.30-2.61	53	33.54	0.53	1.71**	1.20-2.43	53	37.59	0.12	1.13	0.73-1.75
	60	32	30	20.55	0.41	1.51*	1.09-2.07	30	18.99	0.31	1.37	0.99-1.88	30	21.28	0.26	1.30	0.87-1.92
Birth order	**1 ®**	72	12	8.22	-	-	-	29	18.35	-	-	-	12	8.51	-	-	-
	2	73	78	53.42	0.14	1.14	0.89-1.47	73	46.20	0.01	1.01	0.78-1.30	73	51.77	0.33	1.39*	1.03-1.88
	3≥	56	56	38.36	0.10	1.10	0.85-1.43	56	35.44	0.08	1.09	0.83-1.41	56	39.72	0.15	1.17	0.84-1.60
Water facilities	**Yes**	100	62	42.47	-0.16	0.85	0.65-1.12	97	61.39	0.12	1.13	0.85-1.49	62	43.97	0.29	1.34	0.94-1.89
	No ®	101	84	57.53	-	-	-	61	38.61	-	-	-	79	56.03	-	-	-
Mothers age at child birth	**≤ 18 years**	98	65	44.52	0.11	1.12	0.89-1.41	95	60.13	0.22	1.24	0.98-1.58	60	42.55	0.08	1.08	0.81-1.43
	≥19 years ®	103	125	85.62	-	-	-	143	90.51	-	-	-	125	88.65	-	-	-
Birth interval	**< 24 months ®**	101	90	61.64	-	-	-	138	87.34	-	-	-	85	60.28	-	-	-
	≥ 24 months	100	100	68.49	-0.03	0.97	0.78-1.20	100	63.29	-0.11	0.90	0.72-1.12	100	70.92	0.08	1.09	0.84-1.41
Mother education	**Illiterate ®**	109	98	67.12	-	-	-	146	92.41	-	-	-	93	65.96	-	-	-
	Primary ≥	92	92	63.01	0.11	1.12	0.91-1.38	92	58.23	-0.26	0.77*	0.62-0.95	92	65.25	-0.29	0.75*	0.58-0.96
Father education	**Illiterate ®**	108	70	47.95	-	-	-	105	66.46	-	-	-	70	49.65	-	-	-
	Primary ≥	93	120	82.19	0.26	1.30*	1.04-1.62	133	84.18	0.07	1.07	0.86-1.35	115	81.56	-0.02	0.98	0.75-1.28
House Pattern	**Kaccha**	102	69	47.26	-	-	-	99	62.66	-	-	-	64	45.39		-	-
	Pucca®	99	121	82.88	-0.08	0.92	0.75-1.14	139	87.97	0.23	1.25*	1.01-1.55	121	85.82	0.07	1.07	0.84-1.38
Media exposure	**Regularly ®**	91	58	39.73	-	-	-	88	55.70	-	-	-	53	37.59	-	-	-
	Not regularly	110	132	90.41	0.04	1.04	0.84-1.28	150	94.94	0.40	1.50**	1.20-1.86	132	93.62	0.32	1.38*	1.07-1.77
Siblings	**1-2 ®**	102	67	45.89	-	-	-	99	62.66	-	-	-	62	43.97	-	-	-
	3 ≥	99	121	82.88	-0.01	0.99	0.80-1.22	139	87.97	0.20	1.22	0.98-1.51	121	85.82	-0.15	0.86	0.67-1.11
Family size	**≥ 4 ®**	109	93	63.70	-	-	-	146	92.41	-	-	-	93	65.96	-	-	-
	5 ≥	92	97	66.44	-0.04	0.97	0.78-1.19	92	58.23	0.08	1.09	0.88-1.35	92	65.25	-0.19	0.83	0.65-1.07
Toilet facility	**No**	108	70	47.95	0.11	1.17	0.91-1.38	105	66.46	0.28	1.33*	1.07-1.65	70	49.65	0.25	1.29*	1.00-1.65
	Yes ®	93	120	82.19	-	-	-	133	84.18	-	-	-	115	81.56	-	-	-
Electricity	**No**	101	123	84.25	0.28	1.33*	1.04-1.71	141	89.24	0.53	1.70**	1.30-2.22	123	87.23	0.47	1.61**	1.21-2.13
	Yes ®	100	67	45.89	-	-	-	97	61.39	-	-	-	62	43.97	-	-	-
Mother occupation	**Housewife ®**	133	53	36.30	-	-	-	53	33.54	-	-	-	53	37.59	-	-	-
	Manual worker	68	137	93.84	-0.03	0.97	0.79-1.20	185	117.09	0.22	1.25	1.00-1.55	132	93.62	-0.05	0.95	0.74-1.23
Fathers occupation	**Manual worker**	73	73	50.00	0.07	1.07	0.83-1.38	73	46.20	0.31	1.37*	1.06-1.77	73	51.77	0.17	1.19	0.87-1.63
	Others ®	128	117	80.14	-	-	-	165	104.43	-	-	-	112	79.43	-	-	-
Income	**≤ Rs. 2000**	68	35	23.97	0.21	1.23	0.87-1.75	65	41.14	0.10	1.11	0.78-1.59	30	21.28	0.27	1.31	0.86-2.00
	Rs.2001-4000	83	83	56.85	0.03	1.03	0.78-1.35	83	52.53	0.21	1.24	0.94-1.64	83	58.87	0.16	1.18	0.84-1.66
	≥ Rs. 4001 ®	50	72	49.32	-	-	-	90	56.96	-	-	-	72	51.06	-	-	-

Table 3. 40. Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Case Group)

Variable		N (315)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	164	106	62.72	-	-	-
	Girls	151	63	37.28	0.35	1.08	1.03-1.58
Age (in months)	**12-23**	44	35	20.71	0.47	0.63	1.18-2.42
	24-35	85	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	68	29	17.16	-	-	-
	48-59	54	53	31.36	0.58	1.27	1.20-2.43
	60	65	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	135	35	20.71	-	-	-
	2	117	78	46.15	0.12	0.93	0.78-1.30
	3≥	63	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	154	63	37.28	0.17	0.88	0.85-1.49
	No ®	161	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	198	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	117	103	60.95	-	-	-
Birth interval	**< 24 months ®**	165	72	42.60	-	-	-
	≥ 24 months	150	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	190	82	48.52	-	-	-
	Primary ≥	125	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	121	64	37.87	-	-	-
	Primary ≥	194	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	176	68	40.24	-	-	-
	Pucca®	139	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	149	59	34.91	-	-	-
	Not regularly	166	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	198	70	41.42	-	-	-
	3 ≥	117	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	140	76	44.97	-	-	-
	5 ≥	175	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	165	75	44.38	0.28	-	1.07-1.65
	Yes ®	150	94	55.62	-	-	-
Electricity	**No**	187	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	128	65	38.46	-	-	-
Mother occupation	**Housewife ®**	215	33	19.53	-	-	-
	Manual worker	100	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	172	76	44.97	0.31	1.3	1.06-1.77
	Others ®	143	93	55.03	-	-	-
Income	**≤ Rs. 2000**	70	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	71	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	174	56	33.14	-	-	-

Table 3.41: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Case Group)

Variable		N (308)	Moderate Thinness Grade II				
			Frequency	(%)	B	Odds	95% CI
Gender	**Boys ®**	101	105	66.46	-	-	-
	Girls	207	53	33.54	0.36	1.28*	1.03-1.58
Age (in months)	**12-23**	58	34	21.52	0.52	1.69**	1.18-2.42
	24-35	73	22	13.92	0.43	1.54*	1.08-2.19
	36-47 ®	57	29	18.35	-	-	-
	48-59	64	53	33.54	0.53	1.71**	1.20-2.43
	60	56	20	12.66	0.31	1.37	0.99-1.88
Birth order	**1 ®**	128	34	21.52	-	-	-
	2	117	78	49.37	0.01	1.01	0.78-1.30
	3≥	63	46	29.11	0.08	1.09	0.83-1.41
Water facilities	**Yes**	150	62	39.24	0.12	1.13	0.85-1.49
	No ®	158	96	60.76	-	-	-
Mothers age at child birth	**≤ 18 years**	190	65	41.14	0.22	1.24	0.98-1.58
	≥19 years ®	118	93	58.86	-	-	-
Birth interval	**< 24 months ®**	155	71	44.94	-	-	-
	≥ 24 months	153	87	55.06	-0.11	0.90	0.72-1.12
Mother education	**Illiterate ®**	198	81	51.27	-	-	-
	Primary ≥	110	77	48.73	-0.26	0.77*	0.62-0.95
Father education	**Illiterate ®**	121	63	39.87	-	-	-
	Primary ≥	187	95	60.13	0.07	1.07	0.86-1.35
House Pattern	**Kaccha**	172	68	43.04	-	-	-
	Pucca®	136	90	56.96	0.23	1.25*	1.01-1.55
Media exposure	**Regularly ®**	141	58	36.71	-	-	-
	Not regularly	167	100	63.29	0.40	1.50**	1.20-1.86
Siblings	**1-2 ®**	190	69	43.67	-	-	-
	3 ≥	116	89	56.33	0.20	1.22	0.98-1.51
Family size	**≥ 4 ®**	136	75	47.47	-	-	-
	5 ≥	172	83	52.53	0.08	1.09	0.88-1.35
Toilet facility	**No**	161	74	46.84	0.28	1.33*	1.07-1.65
	Yes ®	147	84	53.16	-	-	-
Electricity	**No**	183	103	65.19	0.53	1.70**	1.30-2.22
	Yes ®	125	55	34.81	-	-	-
Mother occupation	**Housewife ®**	210	32	20.25	-	-	-
	Manual worker	98	126	79.75	0.22	1.25	1.00-1.55
Fathers occupation	**Manual worker**	168	75	47.47	0.31	1.37*	1.06-1.77
	Others ®	140	83	52.53	-	-	-
Income	**≤ Rs. 2000**	170	28	17.72	0.10	1.11	0.78-1.59
	Rs.2001-4000	71	75	47.47	0.21	1.24	0.94-1.64
	≥ Rs. 4001 ®	67	55	34.81	-	-	-

Table.3.42: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Case Group)

Variable		N (297)		Moderate Thinness Grade II			
			Frequency	(%)	B	Odds	95% CI
Gender	**Boys ®**	157	100	65.36	-	-	-
	Girls	141	53	34.64	0.25	1.04	0.83-4.29
Age (in months)	**12-23**	36	34	22.22	0.52	0.59	0.24-0.84
	24-35	67	22	14.38	0.43	0.71	0.57-2.33
	36-47 ®	64	24	15.69	-	-	-
	48-59	66	53	34.64	0.53	1.23	1.20-2.52
	60	64	20	13.07	0.31	1.10	0.59-1.77
Birth order	**1 ®**	123	34	22.22	-	-	-
	2	112	78	50.98	0.01	0.89	0.34-1.74
	3≥	62	41	26.80	0.08	1.20	0.78-1.73
Water facilities	**Yes**	145	62	40.52	0.12	0.84	0.34-1.75
	No ®	152	91	59.48	-	-	-
Mothers age at child birth	**≤ 18 years**	190	60	39.22	0.22	1.13	0.34-1.72
	≥19 years ®	107	93	60.78	-	-	-
Birth interval	**< 24 months ®**	150	71	46.41	-	-	-
	≥ 24 months	147	82	53.59	-0.11	0.98	0.95-1.43
Mother education	**Illiterate ®**	193	81	52.94	-	-	-
	Primary ≥	104	72	47.06	-0.26	-0.59	0.72-1.17
Father education	**Illiterate ®**	110	63	41.18	-	-	-
	Primary ≥	187	90	58.82	0.07	1.01	0.62-0.100
House Pattern	**Kaccha**	172	63	41.18	-	-	-
	Pucca®	125	90	58.82	0.23	0.97	0.86-1.40
Media exposure	**Regularly ®**	130	58	37.91	-	-	-
	Not regularly	167	95	62.09	0.40	1.50**	1.20-1.86
Siblings	**1-2 ®**	179	64	41.83	-	-	-
	3 ≥	118	89	58.17	0.20	1.22	0.98-1.51
Family size	**≥ 4 ®**	125	70	45.75	-	-	-
	5 ≥	172	83	54.25	0.08	1.09	0.88-1.35
Toilet facility	**No**	150	69	45.10	0.28	1.33*	1.07-1.65
	Yes ®	147	84	54.90	-	-	-
Electricity	**No**	172	103	67.32	0.53	1.49	0.88-1.40
	Yes ®	125	50	32.68	-	-	-
Mother occupation	**Housewife ®**	199	32	20.92	-	-	-
	Manual worker	98	121	79.08	0.22	1.03	1.30-2.27
Fathers occupation	**Manual worker**	157	70	45.75	0.31	1.26	0.83-4.26
	Others ®	140	83	54.25	-		-
Income	**≤ Rs. 2000**	159	28	18.30	0.10	0.11	1.00-1.60
	Rs.2001-4000	71	70	45.75	0.21	0.78	1.06-1.82
	≥ Rs. 4001 ®	67	55	35.95	-	-	-

Table 3.43: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Case Group)

Variable		N (284)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	143	106	62.72	-	-	-
	Girls	141	63	37.28	0.35	1.06	1.03-1.58
Age (in months)	**12-23**	38	35	20.71	0.47	0.63	1.18-2.42
	24-35	49	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	59	29	17.16	-	-	-
	48-59	64	53	31.36	0.58	1.27	1.20-2.43
	60	74	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	115	35	20.71	-	-	-
	2	107	78	46.15	0.12	0.93	0.78-1.30
	3≥	62	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	132	63	37.28	0.17	0.88	0.85-1.49
	No ®	152	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	180	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	104	103	60.95	-	-	-
Birth interval	**< 24 months ®**	142	72	42.60	-	-	-
	≥ 24 months	142	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	180	82	48.52	-	-	-
	Primary ≥	104	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	97	64	37.87	-	-	-
	Primary ≥	187	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	159	68	40.24	-	-	-
	Pucca®	125	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	117	59	34.91	-	-	-
	Not regularly	167	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	166	70	41.42	-	-	-
	3 ≥	118	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	112	76	44.97	-	-	-
	5 ≥	172	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	137	75	44.38	0.28	-	1.07-1.65
	Yes ®	147	94	55.62	-	-	-
Electricity	**No**	159	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	125	65	38.46	-	-	-
Mother occupation	**Housewife ®**	186	33	19.53	-	-	-
	Manual worker	98	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	144	76	44.97	0.31	1.3	1.06-1.77
	Others ®	140	93	55.03	-	-	-
Income	**≤ Rs. 2000**	146	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	71	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	67	56	33.14	-	-	-

Table 3.44: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Control Group)

Variable		N (319)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	164	106	62.72	-	-	-
	Girls	155	63	37.28	0.35	1.02	1.03-1.58
Age (in months)	**12-23**	55	35	20.71	0.47	0.63	1.18-2.42
	24-35	81	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	68	29	17.16	-	-	-
	48-59	50	53	31.36	0.58	1.27	1.20-2.43
	60	65	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	150	35	20.71	-	-	-
	2	107	78	46.15	0.12	0.93	0.78-1.30
	3≥	62	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	167	63	37.28	0.17	0.88	0.85-1.49
	No ®	152	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	215	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	104	103	60.95	-	-	-
Birth interval	**< 24 months ®**	177	72	42.60	-	-	-
	≥ 24 months	142	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	215	82	48.52	-	-	-
	Primary ≥	104	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	132	64	37.87	-	-	-
	Primary ≥	187	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	194	68	40.24	-	-	-
	Pucca®	125	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	152	59	34.91	-	-	-
	Not regularly	167	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	201	70	41.42	-	-	-
	3 ≥	118	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	157	76	44.97	-	-	-
	5 ≥	162	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	172	75	44.38	0.28	-	1.07-1.65
	Yes ®	147	94	55.62	-	-	-
Electricity	**No**	159	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	160	65	38.46	-	-	-
Mother occupation	**Housewife ®**	196	33	19.53	-	-	-
	Manual worker	133	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	144	76	44.97	0.31	1.3	1.06-1.77
	Others ®	175	93	55.03	-	-	-
Income	**≤ Rs. 2000**	181	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	87	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	51	56	33.14	-	-	-

Table 3.45: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Control Group)

Variable		N (240)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	123	106	62.72	-	-	-
	Girls	117	63	37.28	0.35	1.05	1.03-1.58
Age (in months)	**12-23**	26	35	20.71	0.47	0.63	1.18-2.42
	24-35	48	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	63	29	17.16	-	-	-
	48-59	56	53	31.36	0.58	1.27	1.20-2.43
	60	47	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	111	35	20.71	-	-	-
	2	73	78	46.15	0.12	0.93	0.78-1.30
	3≥	56	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	139	63	37.28	0.17	0.88	0.85-1.49
	No ®	101	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	137	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	103	103	60.95	-	-	-
Birth interval	**< 24 months ®**	140	72	42.60	-	-	-
	≥ 24 months	100	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	148	82	48.52	-	-	-
	Primary ≥	92	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	147	64	37.87	-	-	-
	Primary ≥	93	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	141	68	40.24	-	-	-
	Pucca®	99	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	130	59	34.91	-	-	-
	Not regularly	110	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	141	70	41.42	-	-	-
	3 ≥	99	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	148	76	44.97	-	-	-
	5 ≥	92	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	147	75	44.38	0.28	-	1.07-1.65
	Yes ®	93	94	55.62	-	-	-
Electricity	**No**	101	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	139	65	38.46	-	-	-
Mother occupation	**Housewife ®**	187	33	19.53	-	-	-
	Manual worker	53	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	144	76	44.97	0.31	1.3	1.06-1.77
	Others ®	96	93	55.03	-	-	-
Income	**≤ Rs. 2000**	107	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	83	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	50	56	33.14	-	-	-

Table 3.46: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Control Group)

Variable		N (230)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	118	106	62.72	-	-	-
	Girls	112	63	37.28	0.35	1.06	1.03-1.58
Age (in months)	**12-23**	25	35	20.71	0.47	0.63	1.18-2.42
	24-35	49	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	63	29	17.16	-	-	-
	48-59	50	53	31.36	0.58	1.27	1.20-2.43
	60	43	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	101	35	20.71	-	-	-
	2	73	78	46.15	0.12	0.93	0.78-1.30
	3≥	56	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	129	63	37.28	0.17	0.88	0.85-1.49
	No ®	101	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	127	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	103	103	60.95	-	-	-
Birth interval	**< 24 months ®**	130	72	42.60	-	-	-
	≥ 24 months	100	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	138	82	48.52	-	-	-
	Primary ≥	92	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	137	64	37.87	-	-	-
	Primary ≥	93	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	131	68	40.24	-	-	-
	Pucca®	99	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	120	59	34.91	-	-	-
	Not regularly	110	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	131	70	41.42	-	-	-
	3 ≥	99	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	138	76	44.97	-	-	-
	5 ≥	92	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	137	75	44.38	0.28	-	1.07-1.65
	Yes ®	93	94	55.62	-	-	-
Electricity	**No**	101	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	129	65	38.46	-	-	-
Mother occupation	**Housewife ®**	53	33	19.53	-	-	-
	Manual worker	177	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	73	76	44.97	0.31	1.3	1.06-1.77
	Others ®	157	93	55.03	-	-	-
Income	**≤ Rs. 2000**	97	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	83	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	50	56	33.14	-	-	-

Table 3.47: Effect of socio-economic, demographic and life style related factors on under nutrition in ICDS children (Based on MUAC Control Group)

Variable		N (201)	Moderate Thinness Grade II				
			Frequency	%	B	Odds	95% CI
Gender	**Boys ®**	97	106	62.72	-	-	-
	Girls	104	63	37.28	0.35	1.02	1.03-1.58
Age (in months)	**12-23**	26	35	20.71	0.47	0.63	1.18-2.42
	24-35	42	22	13.02	0.82	0.75	1.08-2.19
	36-47 ®	53	29	17.16	-	-	-
	48-59	48	53	31.36	0.58	1.27	1.20-2.43
	60	32	30	17.75	0.27	1.14	0.99-1.88
Birth order	**1 ®**	72	35	20.71	-	-	-
	2	73	78	46.15	0.12	0.93	0.78-1.30
	3≥	56	56	33.14	0.09	1.24	0.83-1.41
Water facilities	**Yes**	100	63	37.28	0.17	0.88	0.85-1.49
	No ®	101	106	62.72	-	-	-
Mothers age at child birth	**≤ 18 years**	98	66	39.05	0.22	1.17	0.98-1.58
	≥19 years ®	103	103	60.95	-	-	-
Birth interval	**< 24 months ®**	101	72	42.60	-	-	-
	≥ 24 months	100	97	57.40	-0.11	1.02	0.72-1.12
Mother education	**Illiterate ®**	109	82	48.52	-	-	-
	Primary ≥	92	87	51.48	-0.26	-0.55	0.62-0.95
Father education	**Illiterate ®**	108	64	37.87	-	-	-
	Primary ≥	93	105	62.13	0.07	1.05	0.86-1.35
House Pattern	**Kaccha**	102	68	40.24	-	-	-
	Pucca®	99	101	59.76	0.23	1.01	1.01-1.55
Media exposure	**Regularly ®**	91	59	34.91	-	-	-
	Not regularly	110	110	65.09	0.40	1.54	1.20-1.86
Siblings	**1-2 ®**	102	70	41.42	-	-	-
	3 ≥	99	99	58.58	0.20	1.26	0.98-1.51
Family size	**≥ 4 ®**	109	76	44.97	-	-	-
	5 ≥	92	93	55.03	0.08	1.13	0.88-1.35
Toilet facility	**No**	108	75	44.38	0.28	-	1.07-1.65
	Yes ®	93	94	55.62	-	-	-
Electricity	**No**	101	104	61.54	0.53	1.53	1.30-2.22
	Yes ®	100	65	38.46	-	-	-
Mother occupation	**Housewife ®**	133	33	19.53	-	-	-
	Manual worker	68	136	80.47	0.22	1.07	1.00-1.55
Fathers occupation	**Manual worker**	73	76	44.97	0.31	1.3	1.06-1.77
	Others ®	128	93	55.03	-	-	-
Income	**≤ Rs. 2000**	68	38	22.49	0.10	0.15	0.78-1.59
	Rs.2001-4000	83	75	44.38	0.21	0.82	0.94-1.64
	≥ Rs. 4001 ®	50	56	33.14	-	-	-

(p value *<0.05, **<0.001)

Table 3.48: Effect of socio-economic, demographic and life style related factors on under nutrition (WAZ) in ICDS children (Case data)

Case Variable		Phase I		Phase II		Phase III		Phase IV	
		Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI
Gender	Boys ®	-	-	-	-	-	-	-	-
	Girls	1.21*	1.03-1.58	1.31	1.03-1.58	1.23*	1.03-1.58	1.24	1.03-1.58
Age (in months)	12-23	1.59**	1.18-2.42	1.69**	1.18-2.42	1.61**	1.18-2.42	1.62*	1.18-2.42
	24-35	1.51*	1.08-2.19	1.61**	1.08-2.19	1.53*	1.08-2.19	1.54	1.08-2.19
	36-47 ®	-	-	-	-	-	-	-	-
	48-59	1.61**	1.20-2.43	1.71*	1.20-2.43	1.63*	1.20-2.43	1.64	1.20-2.43
	60	1.37	0.99-1.88	1.47	0.99-1.88	1.39*	0.99-1.88	1.4	0.99-1.88
Birth order	1 ®	-	-	-	-	-	-	-	-
	2	1.02	0.78-1.30	1.12	0.78-1.30	1.04	0.78-1.30	1.05	0.78-1.30
	3≥	1.04	0.83-1.41	1.14	0.83-1.41	1.06	0.83-1.41	1.07	0.83-1.41
Water facilities	Yes	1.14	0.85-1.49	1.24	0.85-1.49	1.16	0.85-1.49	1.17	0.85-1.49
	No ®	-	-	-	-	-	-	-	-
Mothers age at child birth	≤ 18 years	1.21	0.98-1.58	1.31	0.98-1.58	1.23	0.98-1.58	1.24	0.98-1.58
	≥19 years ®	-	-	-	-	-	-	-	-
Birth interval	< 24 months ®	-	-	-	-	-	-	-	-
	≥ 24 months	0.92	0.72-1.12	1.02	0.72-1.12	0.94	0.72-1.12	0.95	0.72-1.12
Mother education	Illiterate ®	-	-	-	-	-	-	-	-
	Primary ≥	0.76*	0.62-0.95	0.86	0.62-0.95	0.78	0.62-0.95	0.79	0.62-0.95
Father education	Illiterate ®	-	-	-	-	-	-	-	-
	Primary ≥	1.02	0.86-1.35	1.12	0.86-1.35	1.04	0.86-1.35	1.05	0.86-1.35
House Pattern	Kaccha	-	-	-	-	-	-	-	-
	Pucca®	1.25*	1.01-1.55	1.35	1.01-1.55	1.27	1.01-1.55	1.28	1.01-1.55
Media exposure	Regularly ®	-	-	-	-	-	-	-	-
	Not regularly	1.50**	1.20-1.86	1.6	1.20-1.86	1.52*	1.20-1.86	1.53*	1.20-1.86
Siblings	1-2 ®	-	-	-	-	-	-	-	-
	3 ≥	1.22	0.98-1.51	1.32	0.98-1.51	1.24	0.98-1.51	1.25	0.98-1.51
Family size	≥ 4 ®	-	-	-	-	-	-	-	-
	5 ≥	1.09	0.88-1.35	1.19	0.88-1.35	1.11	0.88-1.35	1.12	0.88-1.35
Toilet facility	No	1.33*	1.07-1.65	1.43**	1.07-1.65	1.35*	1.07-1.65	1.36	1.07-1.65
	Yes ®	-	-	-	-	-	-	-	-
Electricity	No	1.70**	1.30-2.22	1.8	1.30-2.22	1.72**	1.30-2.22	1.73	1.30-2.22
	Yes ®	-	-	-	-	-	-	-	-
Mother occupation	Housewife ®	-	-	-	-	-	-	-	-
	Manual worker	1.25	1.00-1.55	1.35	1.00-1.55	1.27	1.00-1.55	1.28	1.00-1.55
Fathers occupation	Manual worker	1.37*	1.06-1.77	1.47*	1.06-1.77	1.39	1.06-1.77	1.4	1.06-1.77
	Others ®	-	-	-	-	-	-	-	-
Income	≤ Rs. 2000	1.11	0.78-1.59	1.21	0.78-1.59	1.13	0.78-1.59	1.14	0.78-1.59
	Rs.2001-4000	1.24	0.94-1.64	1.34	0.94-1.64	1.26	0.94-1.64	1.27	0.94-1.64
	≥ Rs. 4001 ®	-	-	-	-	-	-	-	-

Table 3.49: Effect of socio-economic, demographic and life style related factors on under nutrition (WAZ) in ICDS children

Case Variable		Phase I		Phase II		Phase III		Phase IV	
		Odds	95% CI	Odds	95% CI	Odds	95% CI	Odds	95% CI
Gender	Boys ®	-	-	-	-	-	-	-	-
	Girls	1.28*	1.01-1.34	1.13*	1.12-1.21	1.22*	1.06-1.34	1.15*	1.02-1.48
Age (in months)	12-23	1.69**	1.16-2.22	1.49**	1.13-2.02	1.25**	1.18-2.12	1.69**	1.18-2.42
	24-35	1.44*	1.07-2.19	1.62*	1.03-2.09	1.14*	1.02-2.29	1.14*	1.06-2.13
	36-47 ®	-	-	-	-	-	-	-	-
	48-59	1.71**	1.20-2.43	1.45**	1.10-2.23	1.51**	1.10-2.13	1.01**	1.01-2.03
	60	1.37	0.99-1.88	1.37	0.99-1.88	1.37	0.99-1.88	1.37	0.99-1.88
Birth order	1 ®	-	-	-	-	-	-	-	-
	2	1.01	0.78-1.30	1.01	0.78-1.30	1.01	0.78-1.30	1.01	0.78-1.30
	3≥	1.09	0.83-1.41	1.09	0.83-1.41	1.09	0.83-1.41	1.09	0.83-1.41
Water facilities	Yes	1.13	0.85-1.49	1.13	0.85-1.49	1.13	0.85-1.49	1.13	0.85-1.49
	No ®	-	-	-	-	-	-	-	-
Mothers age at child birth	≤ 18 years	1.24	0.98-1.58	1.24	0.98-1.58	1.24	0.98-1.58	1.24	0.98-1.58
	≥19 years ®	-	-	-	-	-	-	-	-
Birth interval	< 24 months ®	-	-	-	-	-	-	-	-
	≥ 24 months	0.90	0.72-1.12	0.90	0.72-1.12	0.90	0.72-1.12	0.90	0.72-1.12
Mother education	Illiterate ®	-	-	-	-	-	-	-	-
	Primary ≥	0.77*	0.62-0.95	0.78*	0.62-0.95	0.97*	0.62-0.95	1.47*	0.62-0.95
Father education	Illiterate ®	-	-	-	-	-	-	-	-
	Primary ≥	1.07	0.86-1.35	1.07	0.86-1.35	1.07	0.86-1.35	1.07	0.86-1.35
House Pattern	Kaccha	-	-	-	-	-	-	-	-
	Pucca®	1.25*	1.01-1.55	1.25*	1.01-1.55	1.25*	1.01-1.55	1.25*	1.01-1.55
Media exposure	Regularly ®	-	-	-	-	-	-	-	-
	Not regularly	1.50**	1.20-1.86	1.50**	1.20-1.86	1.50**	1.20-1.86	1.50**	1.20-1.86
Siblings	1-2 ®	-	-	-	-	-	-	-	-
	3 ≥	1.22	0.98-1.51	1.22	0.98-1.51	1.22	0.98-1.51	1.22	0.98-1.51
Family size	≥ 4 ®	-	-	-	-	-	-	-	-
	5 ≥	1.09	0.88-1.35	1.09	0.88-1.35	1.09	0.88-1.35	1.09	0.88-1.35
Toilet facility	No	1.33*	1.07-1.65	1.33*	1.07-1.65	1.33*	1.07-1.65	1.33*	1.07-1.65
	Yes ®	-	-	-	-	-	-	-	-
Electricity	No	1.70**	1.30-2.22	1.70**	1.30-2.22	1.70**	1.30-2.22	1.70**	1.30-2.22
	Yes ®	-	-	-	-	-	-	-	-
Mother occupation	Housewife ®	-	-	-	-	-	-	-	-
	Manual worker	1.25	1.00-1.55	1.25	1.00-1.55	1.25	1.00-1.55	1.25	1.00-1.55
Fathers occupation	Manual worker	1.37*	1.06-1.77	1.37*	1.06-1.77	1.37*	1.06-1.77	1.37*	1.06-1.77
	Others ®	-	-	-	-	-	-	-	-
Income	≤ Rs. 2000	1.11	0.78-1.59	1.11	0.78-1.59	1.11	0.78-1.59	1.11	0.78-1.59
	Rs.2001-4000	1.24	0.94-1.64	1.24	0.94-1.64	1.24	0.94-1.64	1.24	0.94-1.64
	≥ Rs. 4001 ®	-	-	-	-	-	-	-	-

Table 3.50: Composition of Overall pure longitudinal data Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case and Control Group Data present in whole Case and Control Group:

Data Status	Age (months)	Phase I (April 2013 to June 2013)		Phase II (July 2013 to September 2013)		Phase III (Nov. 2013 to Jan. 2013)		Phase IV (Feb. 2013 to April 2014)	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Case Group	**12-23**	18 (12.59)	20 (14.18)	18 (12.59)	20 (14.18)	18 (12.59)	20 (14.18)	18 (12.59)	20 (14.18)
	24-35	28 (19.58)	21 (14.89)	28 (19.58)	21 (14.89)	28 (19.58)	21 (14.89)	28 (19.58)	21 (14.89)
	36-47	35 (24.48)	24 (17.02)	35 (24.48)	24 (17.02)	35 (24.48)	24 (17.02)	35 (24.48)	24 (17.02)
	48-59	30 (20.98)	34 (24.11)	30 (20.98)	34 (24.11)	30 (20.98)	34 (24.11)	30 (20.98)	34 (24.11)
	60-71	32 (22.38)	42 (29.79)	32 (22.38)	42 (29.79)	32 (22.38)	42 (29.79)	32 (22.38)	42 (29.79)
	Total	143 (50.35)	141 (49.65)	143 (50.35)	141 (49.65)	143 (50.35)	141 (49.65)	143 (50.35)	141 (49.65)
		284 (100)		284 (100)		284 (100)		284 (100)	
Control Group	**12-23**	15 (15.46)	11 (10.58)	15 (15.46)	11 (10.58)	15 (15.46)	11 (10.58)	15 (15.46)	11 (10.58)
	24-35	24 (24.74)	18 (17.31)	24 (24.74)	18 (17.31)	24 (24.74)	18 (17.31)	24 (24.74)	18 (17.31)
	36-47	23 (23.71)	30 (28.85)	23 (23.71)	30 (28.85)	23 (23.71)	30 (28.85)	23 (23.71)	30 (28.85)
	48-59	15 (15.46)	33 (31.73)	15 (15.46)	33 (31.73)	15 (15.46)	33 (31.73)	15 (15.46)	33 (31.73)
	60-71	20 (20.62)	12 (11.54)	20 (20.62)	12 (11.54)	20 (20.62)	12 (11.54)	20 (20.62)	12 (11.54)
	Total	97 (48.26)	104 (51.74)	97 (48.26)	104 (51.74)	97 (48.26)	104 (51.74)	97 (48.26)	104 (51.74)
		201 (100)		201 (100)		201 (100)		201 (100)	

Perthensis indicate percentage

The Overall pure longitudinal data:

The data was ananlysed in two types first taken whole data in different Phase's of Case and Control and another type was the data were present in fourth Phase of the study. That data were utilized as pure longitudinally study. The **Table 3.50** shows that the composition of boys and girls in Phase I, Phases II, Phase III, and Phase IV of Case and Control Group of data. The overall Case Group of children found that 315 (Boys=52.06 %, girls=47.94 %), 308 (Boys=32.79 %, girls=67.21%), 297 (Boys=52.86 %, girls=47.47 %), and 284 (Boys=50.35 %, girls=49.65%), and in Control Group 319 (Boys=51.41 %, girls=48.59 %), 240 (Boys=51.25 %, girls=48.75 %), 230 (Boys=51.34 %, girls=48.69 %), and 201(Boys=48.26 %, girls=51.74 %), In Case of Case Group of age in 12-23 months the higher percentage was found among girls in Phase II (19.81 %). Similarly in age Group 24-35, 36-47, 48-59 and 60-71 were in Phase I boys (30.49 %), in Phase III boys (27.56 %), in Phase III girls (24.82 %) and in Phase IV girls (29.79 %). In Case of Control Group of age in 12-23 months the higher percentage was found among girls in Phase I (21.94 %). Similarly in age Group 24-35, 36-47, 48-59 and 60-71 were in Phase I boys (30.49 %), in Phase IV girls (28.85 %), in Phase IV girls (31.73 %) and in Phase II girls (23.87 %).

The **Table 3.50** shows that the data were present in the each Phase of the study. So the result shows that overall Case and Control data were 248 (boys=143 and girls=141) and 201 (boys= 97, girls=104). In Case of Case Group of age in 12-23 months the percentage was found among girls in each Phases were found (boys= 12.59%, girls=14.18%). Similarly in age Group of 24-35, 36-47, 48-59 and 60-71 were among boys (19.58 %), (17.02 %), (15.46 %), (10.58%) and among girls were (19.58 %), (14.18 %), (24.74%) and (17.31%). In Control Group the result showed that 14.71%, 23.53%, 25.49%, 21.57%, and 14.17% among boys and 10.00%, 16.36%, 28.18%, 30.00% and 15.45% among girls respectively.

Both the data were utilizing for present study data analysis. So this is the complete source for the present study. This data was used for the data controlling of the present study population.

Assessment of nutritional status using anthropometry and body composition

General descriptive statistics of age and the anthropometric variable

The descriptive statistics (mean ± SD) of the age and the anthropometric variables recorded in the present study are presented in the measurements recorded were weight, height, MUAC, HC, TSF and SSF. The data were divided into four Phases; Phase I, Phase II, Phase III and Phase IV. The four tables were combined and presented age wise. So the two tables' Case and Control tables were represented for the result description. The tables were described in that manner; List of Case and Control Group table (Case tables are as follows **Table 3.51** for boys and **table 3.52** for girls **Table 3.53** and **table 3.54 (**for girls and boys of Contorl**)** and the other tables are shows significant result of Case and Control Group of study. firstly the mean and median of actual age Group of children were describe as Phase I-IV of the present study, changes in anthropometric variables analyzed from Phase I-IV, including ANOVA test value from Phase I-IV, World Health Organization (WHO) z-score variables from Phase I-IV, Body composition variation from Phase I-IV, difference between Case vs. Control variables from Phase I-IV, prevalence of stunting (low height for age), underweight (low weight for age) , wasting (low weight for age) from Phase I-IV, prevalence of thinness (low BMI for age) from Phase I-IV, prevalence of under nutrition based on MUAC for Phase I-IV describe below, prevalence of under nutrition based on Head Circumference from Phase I-IV, different variables of CIAF (composite index of anthropometric variables) from Phase I-IV analyzed, composition of sample (boys and girls)

those data were completely present in whole four Phases so seasonal variation were described also describe form Phase I-IV, difference checked between (boys vs. boys) and (girls vs. girls) presented from Phase I-IV of Case Group and Control Group variables in the present study. The overall result not using or showing for analyzed data in some tables due to longitudinal analysis is a continues process. Only comparison of study is highlighted for the study population (Machfudz 2002, Hedenker and Gibbon 2006, Khambaliya et al., 2012). The result also included the figure and charts for data description. The result describe below:

4. Mean and Median age of Case and Control data:

The result showed in **Table 3.51, 3.52 (Case group), 3.53 and 3.54 (Control Group)** the mean age to be higher among the boys than girls in total Phases of Case Group. The results further indicated the mean and median values among boys were observed higher in Phase I (in 12-23 months 1.5±1.24 and 1.7±2.04), (in 24-35 moths 2.8±1.32 and 2.7±2.2), (in 36-47 months 3.4±1.14 and 3.5±2.24), (in 48-59 months 4.6±1.26 and 4.6±1.26), (in 60-71 months 5.0±2.27 and 5.1±2.13) and the variables were gradually increases and result shows in Phase IV of Case data i.e. In 24-35 months 1.7±1.22 and 1.8±1.42), (in 36-47 months 2.0±1.18 and 2.1±1.48), (in 48-59 months 3.6±1.14 and 3.7±1.34), (in 60-71 months 4.8±1.21 and 4.9±1.25), (in 5.0±1.36 and 5.1±1.26) respectively. And among girls the result indicated that in Phase I of 1, 2, 3, 4 and 5 years; 1.4 ±1.6, 2.5±1.69, 3.1 ±1.78, 4.2 ±1.87, 5.1 ±1.96 and4.2±2.05. And median age was 1.4±1.85, 2.6 ±1.88, 3.4 ±1.91, 4.7±1.94 and 5.9±1.97 respectively. In Phase IV mean and median age was shows that (in 1st year 1.9±1.24 and 1.1±1.21), (2nd year 2.2±1.32 and 2.4±1.32), (3rd year 3.8±1.4 and 3.0±1.43), (4th year 4.0±1.48 and 4.0±1.54), and (5th year 5.2±1.56 and 5.9 ±1.65). *Figure A* and B define that the total value of mean and median age was increases gradually. The Overall result shows statistically significant association of age Group among boys and girls.

Table 3.51: Mean and Median age of Case data (boys):

Boy's Age (in month)	Phase I		Phase II		Phase III		Phase IV		F
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
12-23	1.5 ±1.24	1.7 ±2.04	1.5 ±1.21	1.6 ±1.32	1.6 ±1.42	1.7 ±1.12	1.7 ±1.22	1.8 ±1.42	0.00**
24-35	2.8 ±1.32	2.7 ±2.12	2.8±1.32	2.9 ±1.28	2.9 ±1.51	2.0 ±1.21	2.0 ±1.18	2.1 ±1.48	0.00*
36-47	3.4 ±1.14	3.5 ±2.24	3.4 ±1.43	3.5 ±1.24	3.5 ±1.62	3.6 ±1.13	3.6 ±1.14	3.7 ±1.34	0.00**
48-9	4.6 ±1.26	4.6 ±1.26	4.6 ±1.54	4.7 ±1.20	4.7 ±1.69	4.8 ±1.27	4.8 ±1.21	4.9 ±1.25	0.00*
60	5.0 ±2.27	5.1 ±2.13	5.8 ±1.65	5.9 ±1.16	5.9 ±1.78	5.0 ±1.13	5.0 ±1.36	5.1 ±1.26	0.00**
Total	4.2 ±1.38	4.2 ±1.18	4.3 ±1.76	4.3 ±1.12	4.3 ±1.87	4.4 ±1.11	4.4 ±1.32	4.5 ±1.52	0.00**

(*p<0.05, **p<0.01)

Table 3.52. Mean and Median age of Case data (girls):

Girl's Age (in month)	Phase I		Phase II		Phase III		Phase IV		F
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
12-23	1.4 ±1.6	1.5 ±1.85	1.6±1.39	1.68±1.55	1.7±1.76	1.85±1.42	1.9±1.24	1.1±1.21	0.00*
24-35	2.5 ±1.69	2.6 ±1.88	2.9±1.42	2.99±1.58	2.4±1.79	2.16±1.51	2.2±1.32	2.4±1.32	0.00**
36-47	3.1 ±1.78	3.4±1.91	3.4±1.45	3.58±1.61	3.3±1.82	3.75±1.6	3.8±1.4	3.0±1.43	0.00*
48-9	4.2 ±1.87	4.7±1.94	4.77±1.48	4.81±1.64	4.86±1.85	4.98±1.69	4.0±1.48	4.0±1.54	0.00**
60	5.1 ±1.96	5.9±1.97	5.6±1.51	5.00±1.67	5.05±1.88	5.17±1.78	5.2±1.56	5.9±1.65	0.00**
Total	4.2±2.05	4.1 ±2.98	4.3±1.39	4.39±1.71	4.44±1.91	4.42±1.87	4.5±1.64	4.4±1.76	0.00**

Case Data :(*p<0.05, **p<0.01)

Table 3.53. Mean and Median age of Control data (Boys and Girls):

Boy's Age	Phase I		Phase II		Phase III		Phase IV		F
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
1 years	1.4 ±1.14	1.4 ±1.34	1.3 ±1.21	1.5 ±1.32	1.4 ±1.12	1.7 ±1.12	1.3 ±1.22	1.3 ±1.42	0.00**
2 years	2.7 ±1.16	2.1 ±1.42	2.6 ±1.32	2.8 ±1.28	2.8±1.11	2.1 ±1.21	2.0 ±1.18	2.0 ±1.48	0.00*
3 years	3.3 ±1.24	3.2 ±1.34	3.1 ±1.43	3.3 ±1.24	3.2 ±1.12	3.3 ±1.13	3.5 ±1.14	3.4 ±1.34	0.00**
4 years	4.5 ±1.26	4.3 ±0.26	4.5 ±1.54	4.2 ±1.20	4.4 ±1.19	4.2 ±1.27	4.7 ±1.21	4.4 ±1.25	0.00*
5 years	5.1 ±2.27	5.0 ±1.13	5.2 ±1.65	5.3 ±1.16	5.5 ±1.18	5.1 ±1.13	5.1 ±1.36	5.3 ±1.26	0.00**
Total	4.2 ±1.28	4.3 ±2.18	4.1 ±1.76	4.3 ±1.12	4.2 ±1.37	4.4±1.11	4.2 ±1.32	4.6 ±1.52	0.00**

(*p<0.05, **p<0.01)

Table 3.54: Mean and median age of Control data (Girls):

Girl's Age	Phase I		Phase II		Phase III		Phase IV		F
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	
1 years	1.2 ±1.60	1.3 ±1.45	1.4 ±1.19	1.4 ±1.35	1.6 ±1.76	1.3 ±1.42	1.4 ±1.24	1.5 ±1.21	0.00*
2 years	2.3 ±1.69	2.5 ±1.58	2.5 ±1.12	2.5 ±1.28	2.3 ±1.79	2.5 ±1.51	2.3 ±1.32	2.3 ±1.32	0.00**
3 years	3.2 ±1.78	3.3 ±1.61	3.3±1.15	3.4 ±1.31	3.2 ±1.82	3.5 ±1.6	3.4 ±1.4	3.3 ±1.43	0.00*
4 years	4.2 ±1.87	4.1 ±1.44	4.3±1.28	4.3 ±1.24	4.5 ±1.85	4.5 ±1.69	4.2 ±1.48	4.5 ±1.54	0.00**
5 years	5.1 ±1.96	5.2 ±1.47	5.5±1.21	5.0±1.37	5.1 ±1.88	5.5 ±1.78	5.1 ±1.56	5.6 ±1.65	0.00**
Total	4.2±2.05	4.1 ±2.48	4.2 ±1.29	4.3 ±1.21	4.1 ±1.91	4.5 ±1.87	4.1 ±1.64	4.6 ±1.76	0.00**

(*p<0.05, **p<0.01)

Figure 3.33 Meadian age of boys and girls:

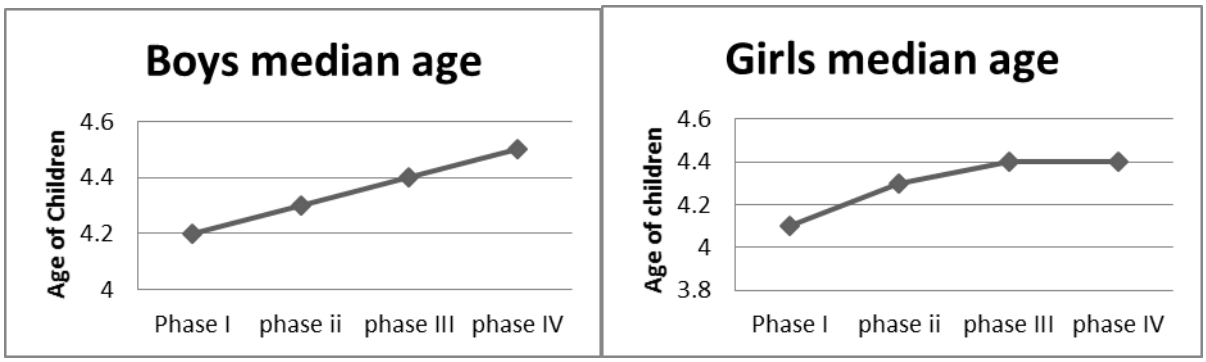


Figure shows the mean and median

Figure 3.34: Mean and Median age of Control data:

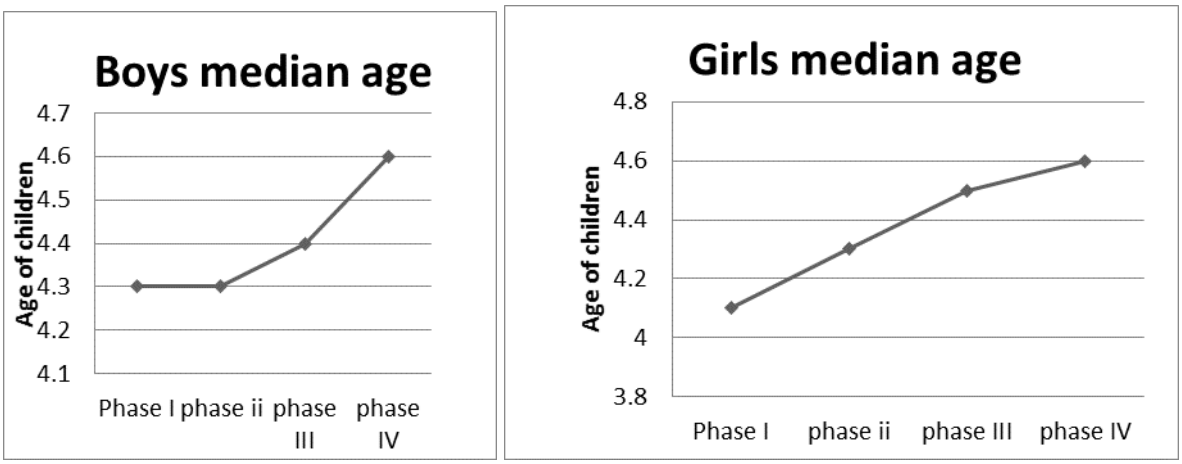
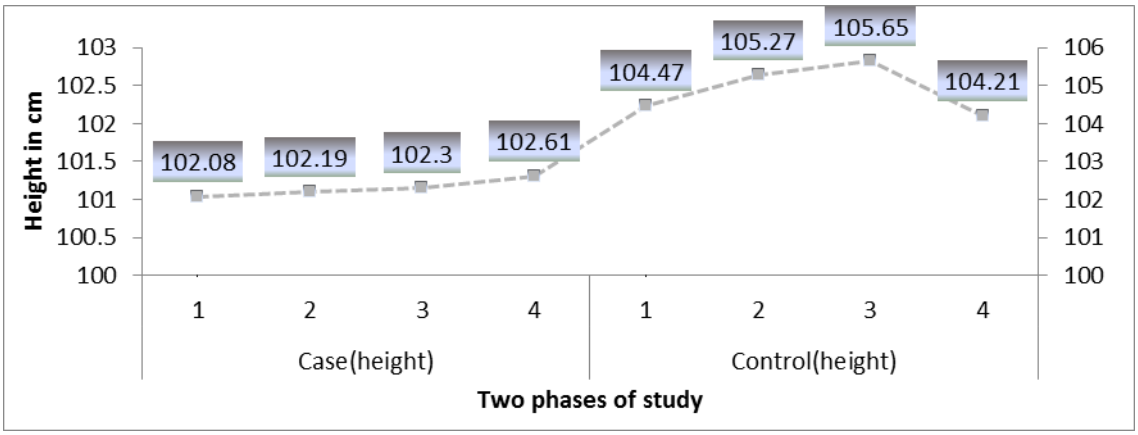
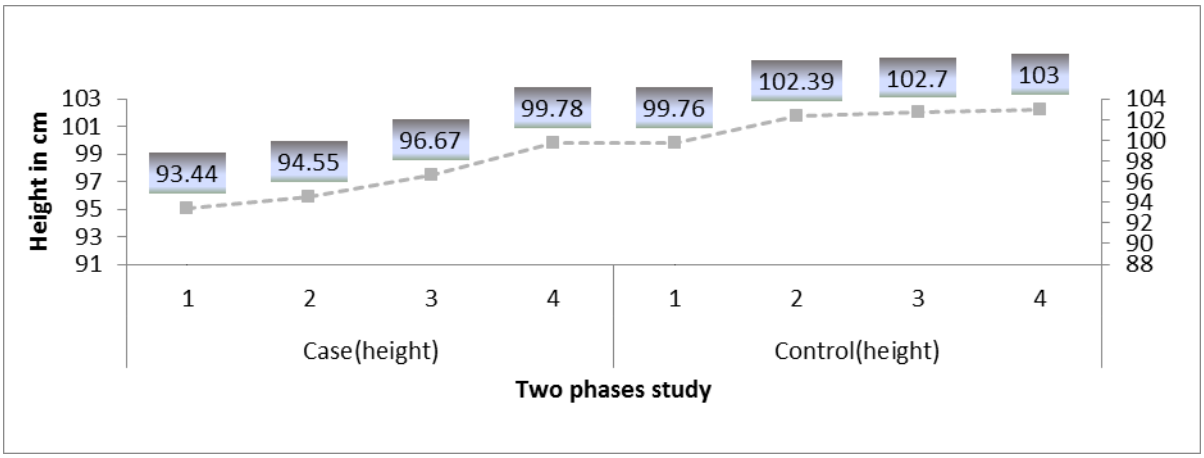


Figure 3.35. Compression of children data according to Case and Control study:

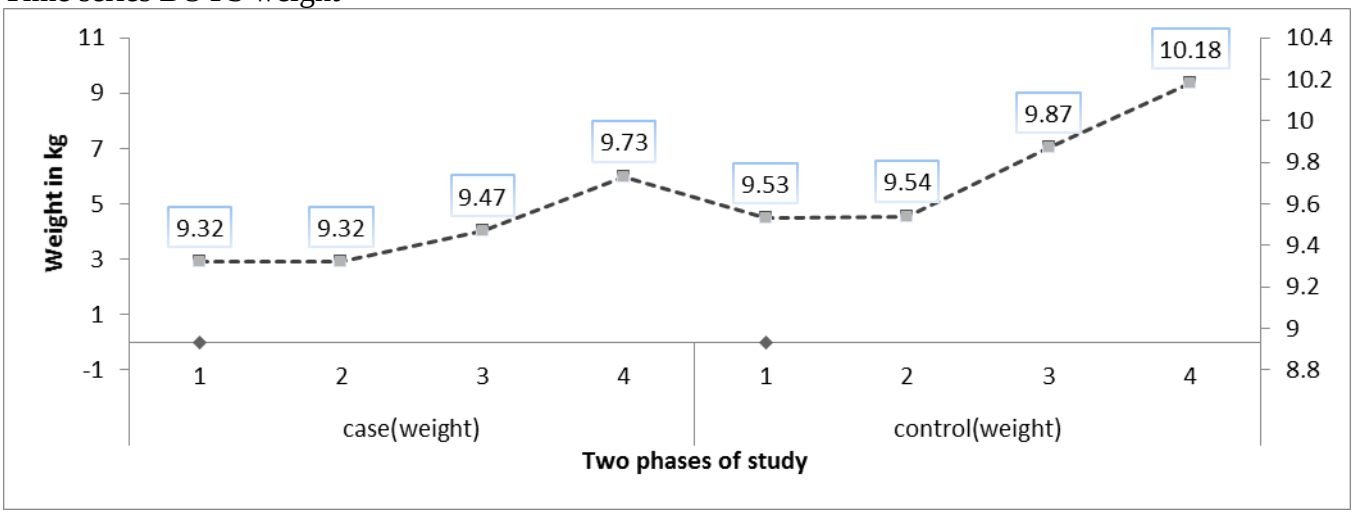
Time series: boys



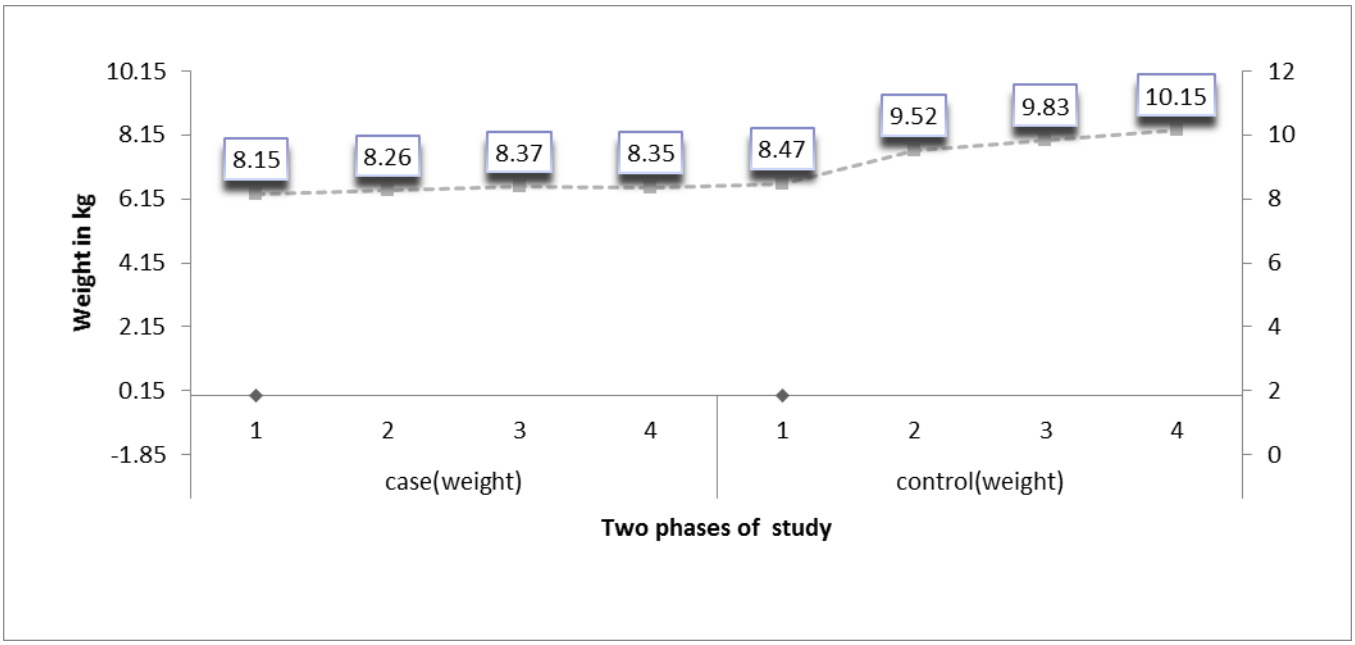
Girls



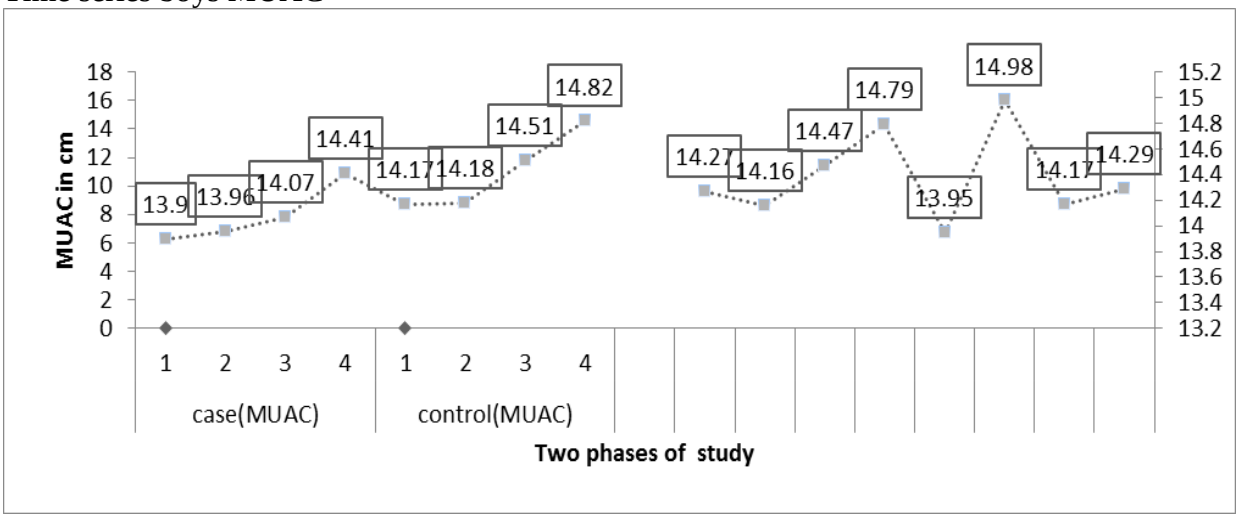
Time series BOYS weight



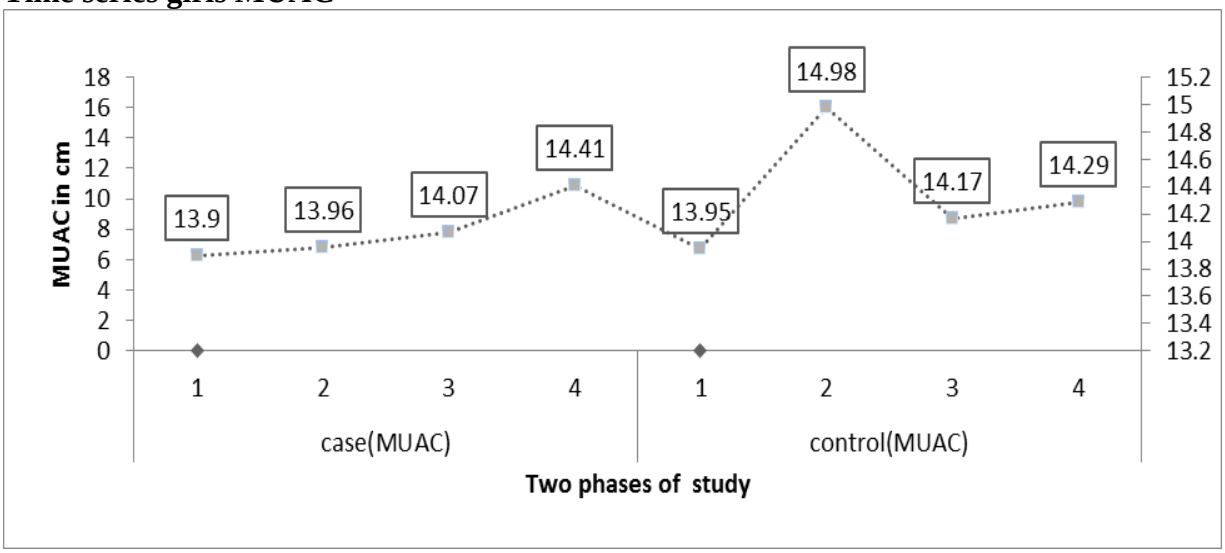
Time series girl's weight



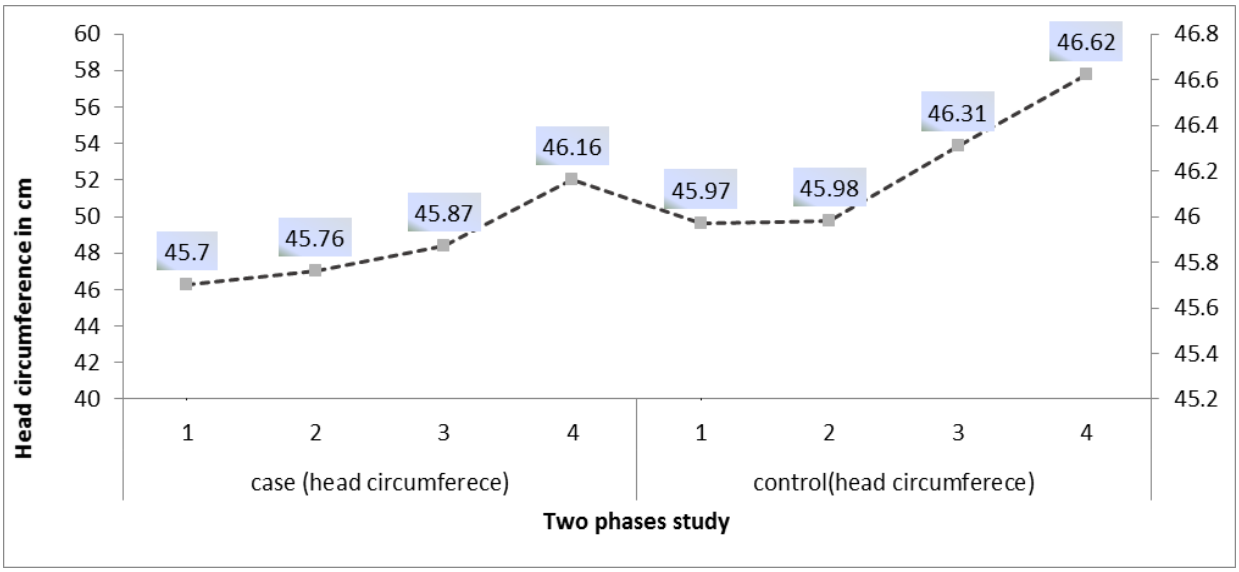
Time series boys MUAC



Time series girls MUAC



Time series



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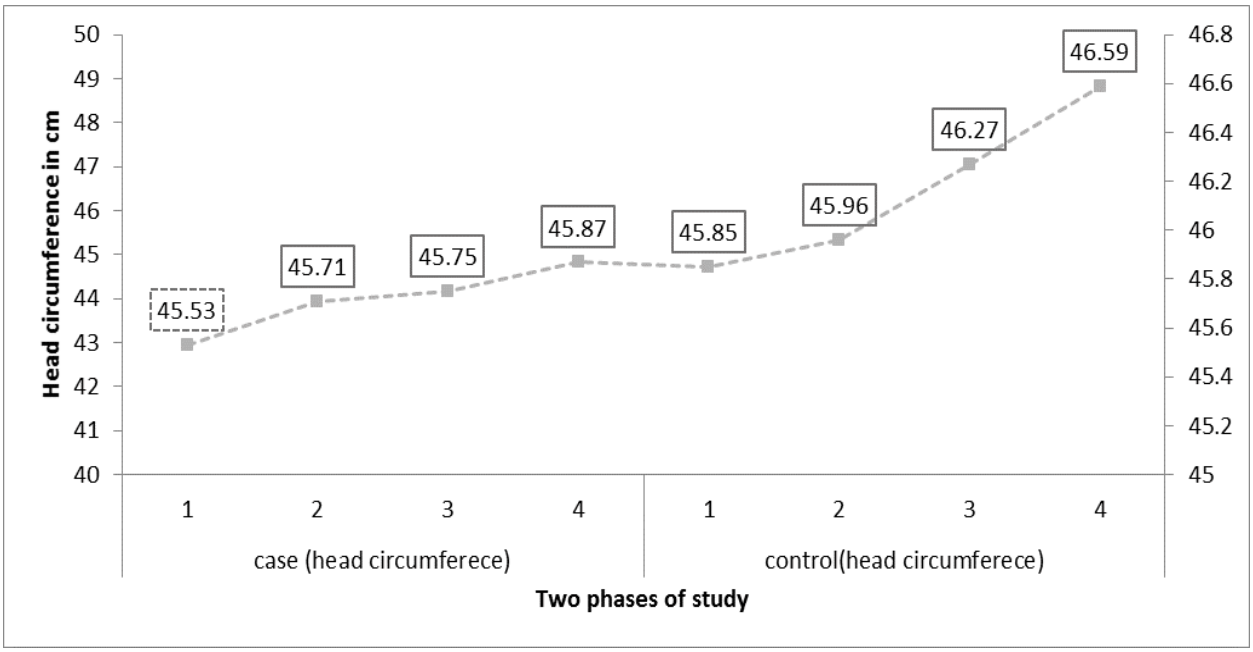
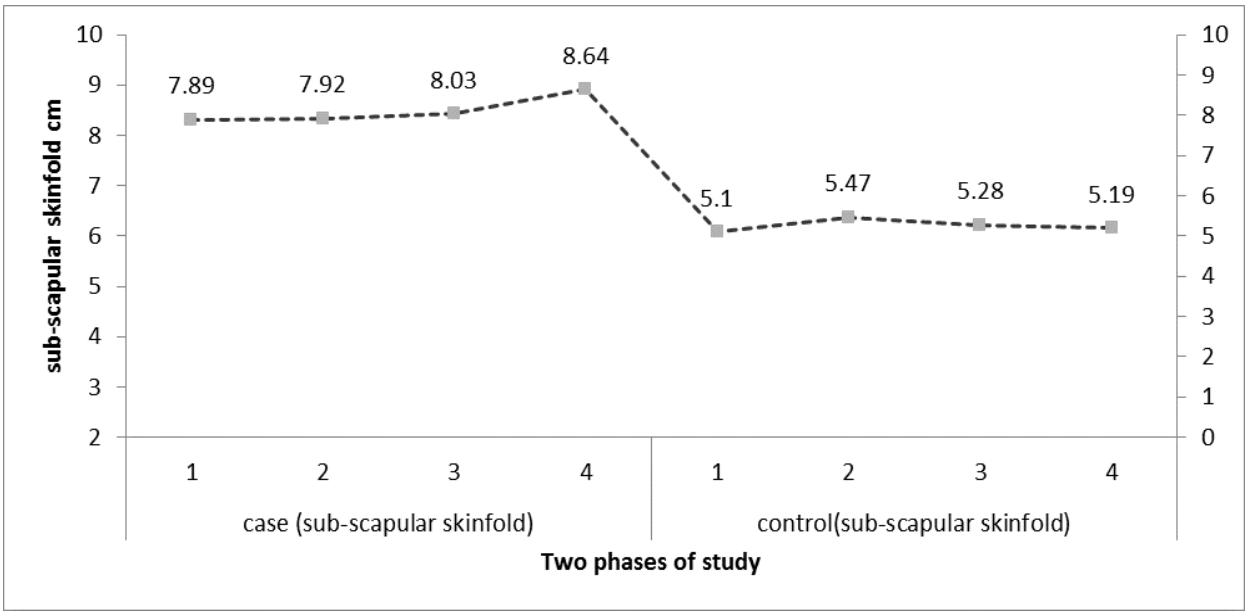


Time series



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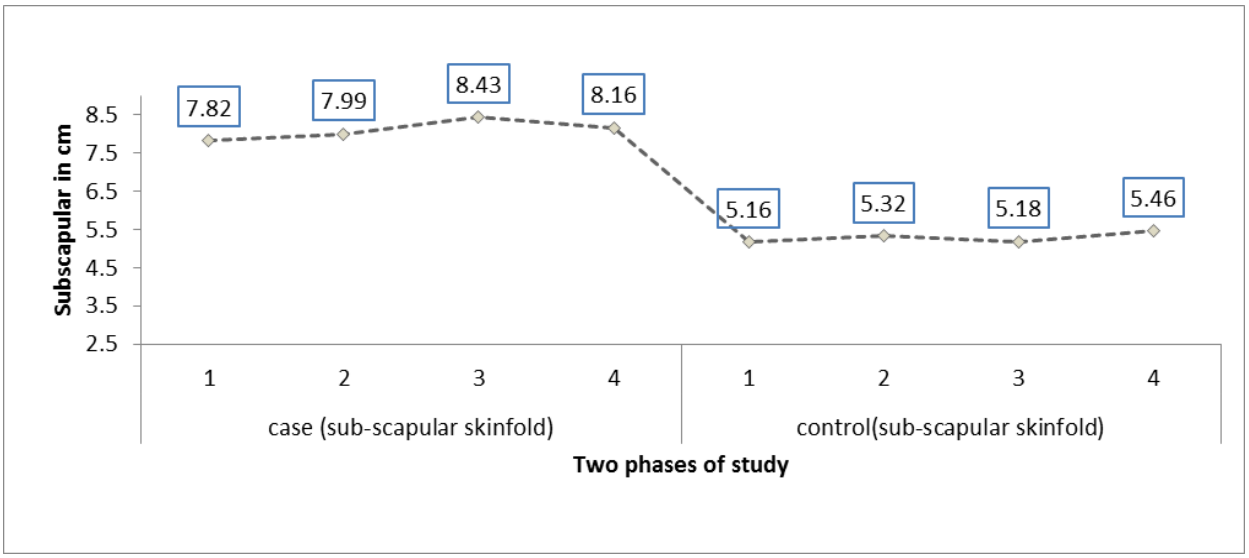
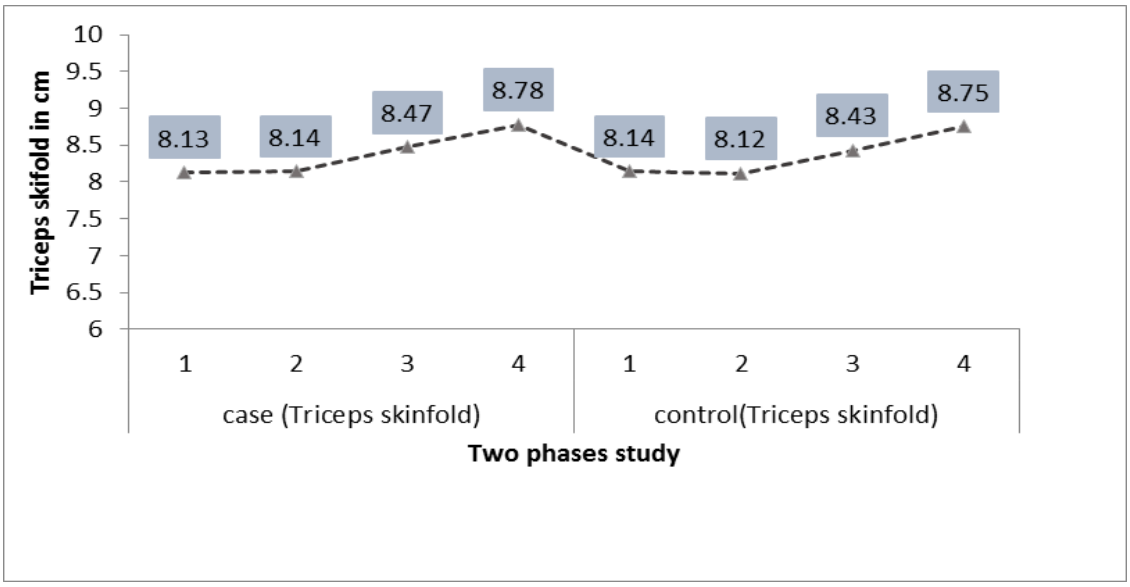
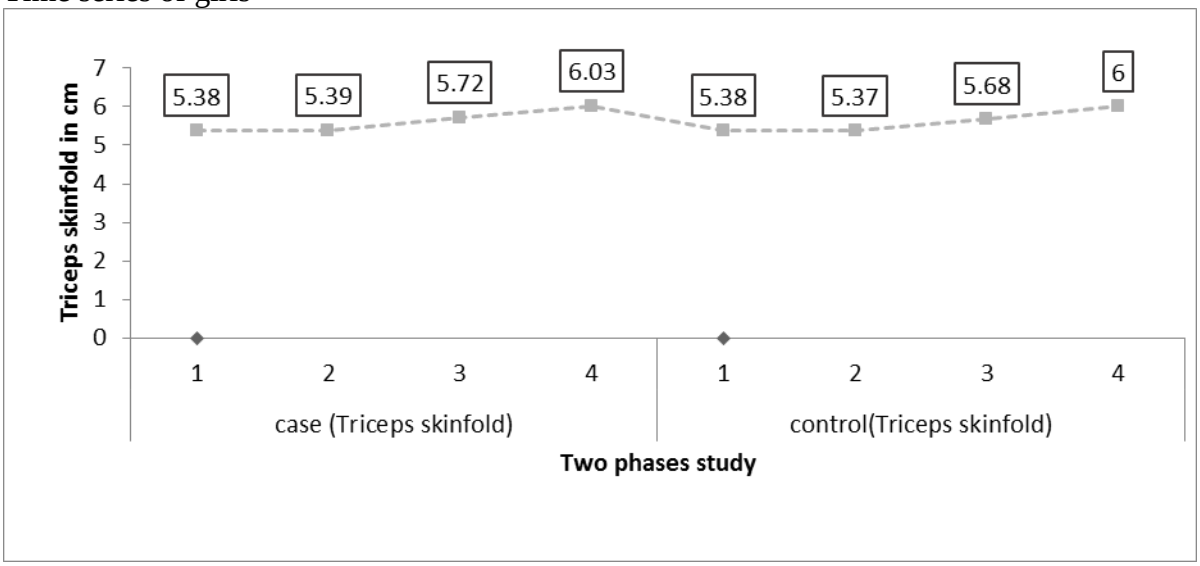


Time series



Time series of girls



Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case Group Data Overall Anthropometric variables

The anthropometric variables in different Phases of study children and their mother were presented in **Table 3.55 (Case Group)**, and **3.56** (**Control group**) these table was analyzed for the the association of overall mean age, height, weight, MUAC, TSF, SSF, children BMI, mother's height, mother's weight, mother' BMI the result show that in Case Group of Phase I boys and their mothers were 3.54 ±4.32, 71.1±4.07, 8.16±1.5, 12.32±1.12, 43.75±2.20, 6.20±1.31, 12.7±1.22, 143.15 ±1.21, 43.40±1.81, 22.36±1.46, and among girls and their mothers were 3.21±5.23, 70.18±4.97, 4.15±1.65, 10.85±1.04, 42.15±2.50, 5.80±7.80, 13.2±2.24, 141.36±2.31, 42.12±3.42, 21.32±4.21. In Phase II the result shows that among boys and their mothers were 4.71±4.61**,** 71.29±5.19**,** 8.27±4.7**,** 12.43±2.24**,** 43.86±3.32**,** 6.31±2.43**,** 14.3±2.75**,** 143.67±1.10**,** 43.50±1.86**,** 23.58±1.38, among girls and their mothers were 4.21±5.87**,**70.29±8.09**,** 4.26±4.77**,** 10.96±4.16**,** 42.26±5.62**,** 5.92±0.92**,** 13.9±4.32**,** 142.65±2.31**,** 42.54±3.21**,** 24.92±4.22. In Phase III the result shows that among boys and their mothers were 4.84 ±5.72, 71.40±6.31, 8.38±3.59, 12.54±3.36, 43.97±4.44, 6.42±3.55, 14.4±4.23, 152.76±1.41, 44.50±1.02, 23.65±1.49, among girls and their mothers were 5.32 ±6.52, 70.41±1.21, 4.37±7.89, 11.07±7.28, 42.37±8.74, 6.03±4.04, 16.6±4.53, 150.14±3.21, 45.23±2.42, 27.21±2.15. In Phase IV the result shows that among boys and their mothers were 5.01 ±4.32, 71.51±9.43, 8.49±6.71, 12.65±6.48, 43.97±4.44, 6.42±3.55, 16.8±4.64, 157.37±1.12, 45.60±1.21, 24.05±1.72, among girls and their mother's were5.21 ±6.21, 70.52±4.33, 4.49±1.01, 11.19±0.40, 42.49±1.86, 6.14±7.16, 16.6±4.76, 158.32±2.24, 46.12±2.36, 24.96±2.54 respectively. The overall result shows in Case Group was statistically significant association of anthropometric variables.

The result also shows that the mean difference in seasonal variation was found that the overall mean of age, height, weight, MUAC, TSF, SSF was lower than the boys except the BMI of girls higher in the compared with boys. The result also shows girl's mothers were height and weight was lower than the boy's mother but point differences found in BMI of mother's.

On the other hand the result shows in Control Group was found in **Table 3.56** that Phase I boys and their mothers were 3.12 ± 3.43, 72.50±6.38, 8.48±3.66, 12.64±3.43, 44.07±4.51, 6.52±3.62, 12.0±2.32, 144.38±4.43, 43.60±1.81, 19.36±1.46 and among girls and their mothers were 3.34±6.32, 70.5±07.28, 4.47±3.96, 11.17±3.35, 42.47±4.81, 6.13±0.11, 12.6±3.25, 145.21±2.32, 43.98±2.87, 20.14±3.01, In Phase II the result shows that among boys and their mothers were 3.54 ± 4.18, 72.51±5.57, 8.49±2.85, 12.65±2.62, 44.08±3.70, 6.53±2.81, 14.8±3.33, 145.61±5.10, 44.75±1.86, 24.58±1.38, among girls and their mothers were 4.35±5.01, 72.49±7.20, 8.47±4.48, 12.63±4.25, 44.06±5.33, 6.51±4.44, 13.0±4.65, 146.21±2.54, 45.74±4.54, 19.57±5.4. In Phase III the result shows that among boys and their mothers were 4.54 ± 4.01, 72.84±7.07, 8.82±4.35, 12.98±4.12, 44.41±5.20, 6.86±4.31, 16.0±3.21, 146.76±3.41, 47.60±2.02, 22.12±1.49, among girls and their mothers were 4.21±5.34, 72.81±0.33, 8.78±7.61, 12.94±7.38, 44.37±8.46, 6.82±7.57, 15.4±5.43, 145.72±4.32, 48.45±4.56, 20.21±6.54.In Phase IV the result shows that among boys and their mothers were 5.54±4.15, 73.16±0.20, 9.13±7.48, 13.29±7.25, 44.72±8.33, 7.17±7.44, 16.6±5.32, 5.01±4.32, 71.51±9.43, 8.49±6.71, 12.65±6.48, 43.97±4.44, 6.42±3.55, 16.8±4.64,157.37±1.12, 45.60±1.21, 24.05±1.72, among girls and their mothers were 5.21 ±6.21, 70.52±4.33, 4.49±1.01, 11.19±0.40, 42.49±1.86, 6.14±7.16, 16.6±4.76, 158.32±2.24, 46.12±2.36, 24.96±2.54 respectively. The overall result shows in Case Group was statistically significant association of anthropometric variables. The result also shows that

the mean difference in seasonal variation was found that the overall mean of age, height, weight, MUAC, TSF, SSF was lower than the boys except the BMI of girls higher in the compared with boys. The result also shows among girl's that their mothers height and weight was lower than the mother of boys but point differences found in BMI of mother's.

Table 3.55: Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case Group Data Overall Anthropometric variables:

Data Status	Variables	Phase I (315) (April 2013 to June 2013)			Phase II (308) (July 2013 to September 2013)			Phase III (297) (Nov. 2013 to Jan. 2013)			Phase IV (284) (Feb. 2013 to April 2014)		
		Boys	Girls	F-test	Boys	Girls	F-test	Boys	Girls	F-test	Boys	Girls	F-test
Case Group	Age	3.54 ±4.32	3.21 ±5.23	6.32*	4.71 ± 4.61	4.21 ±5..87	5.12*	4.84 ±5.72	5.32 ±6.52	6.48*	5.01 ±4.32	5.21 ±6.21	4.12
	Height	71.18 ±4.07	70.18±4.97	11.37**	71.29±5.19	70.29±8.09	10.37**	71.40±6.31	70.41±1.21	32.37**	71.51±9.43	70.52±4.33	41.37**
	Weight	8.16±1.5	4.15±1.65	14.12**	8.27±4.7	4.26±4.77	9.12**	8.38±3.59	4.37±7.89	6.12**	8.49±6.71	4.49±1.01	7.12**
	MUAC	12.32±1.12	10.85±1.04	0.72	12.43±2.24	10.96±4.16	1.72	12.54±3.36	11.07±7.28	5.72	12.65±6.48	11.19±0.40	3.72
	TSF	43.75±2.20	42.15±2.50	3.32	43.86±3.32	42.26±5.62	6.32	43.97±4.44	42.37±8.74	3.32	43.97±4.44	42.49±1.86	1.32
	SSF	6.20±1.31	5.80±7.80	5.92	6.31±2.43	5.92±0.92	0.65	6.42±3.55	6.03±4.04	5.01	6.42±3.55	6.14±7.16	3.65
	BMI	12.7±1.22	13.2±2.24	7.98	14.3±2.75	13.9±4.32	2.311	14.4±4.23	16.6±4.53	4.221	16.8±4.64	16.6±4.76	43.11
	Mother's Height	143.15±1.21	141.36±2.31	25.12**	143.67±1.1	142.65±2.31	16.74*	152.76±1.41	150.14±3.21	25.84**	157.37±1.1	158.32±2.24	21.64**
	Mother's weight	43.40 ±1.81	42.12±3.42	36.54**	43.50±1.86	42.54±3.21	74.21**	44.50±1.02	45.23±2.42	12.62**	45.60±1.21	46.12±2.36	18.83**
	Mother's BMI	22.36 ±1.46	21.32±4.21	8.42	23.58±1.38	24.92±4.22	9.54	23.65±1.49	27.21±2.15	10.44**	24.05±1.72	24.96±2.54	12.52*

Table 3. 56. Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Control Group Data Overall Anthropometric variables

Data Status	Variables	Phase I (319) (April 2013 to June 2013)			Phase II (240) (July 2013 to September 2013)			Phase III (230) (Nov. 2013 to Jan. 2013)			Phase IV (201) (Feb. 2013 to April 2014)		
		Boys	Girls	F-test	Boys	Girls	F-test	Boys	Girls	F-test	Boys	Girls	F-test
Control Group	Age	3.12 ± 3.43	3.34±6.32	3.32	3.54 ± 4.18	4.35±5.01	3.32	4.54 ± 4.01	4.21±5.34	3.32	5.54 ± 4.15	5.43±5.23	3.43
	Height	72.50±6.38	70.5±07.28	11.37	72.51±5.57	72.49±7.20	10.37	72.84±7.07	72.81±0.33	8.37	73.16±0.20	73.12±3.46	6.37
	Weight	8.48±3.66	4.47±3.96	14.12	8.49±2.85	8.47±4.48	13.12	8.82±4.35	8.78±7.61	11.12	9.13±7.48	9.10±0.74	9.12
	MUAC	12.64±3.43	11.17±3.35	0.72	12.65±2.62	12.63±4.25	0.28	12.98±4.12	12.94±7.38	2.28	13.29±7.25	13.26±0.51	4.28
	TSF	44.07±4.51	42.47±4.81	3.32	44.08±3.70	44.06±5.33	2.32	44.41±5.20	44.37±8.46	0.32	44.72±8.33	44.69±1.59	1.68
	SSF	6.52±3.62	6.13±0.11	5.92	6.53±2.81	6.51±4.44	4.92	6.86±4.31	6.82±7.57	2.92	7.17±7.44	7.14±0.70	0.92
	BMI	12.0±2.32	12.6±3.25	6.99	14.8±3.33	13.0±4.65	5.92	16.0±3.21	15.4±5.43	4.87	16.6±5.32	16.8±5.43	9.43
	Mother's Height	144.38±4.43	145.21±2.32	8.34*	145.61±5.10	146.21±2.54	8.34*	146.76±3.41	145.72±4.32	8.34*	148.37±4.12	146.32±4.54	8.34*
	Mother's Weight	43.60±1.81	43.98±2.87	4.39*	44.75±1.86	45.74±4.54	4.39*	47.60±2.02	48.45±4.56	4.39*	50.05±1.21	49.58±5.43	4.39*
	Mother's BMI	19.36±1.46	20.14±3.01	3.23*	24.58±1.38	19.57±5.43	3.23*	22.12±1.49	20.21±6.54	3.23*	23.05±0.72	20.35±4.54	3.23*

Table 3.57: Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case Group Data Overall Anthropometric variables:

Data Status	Variables	Phase I (315) vs. Phase II (308)		Phase II (308) vs. Phase III (297)		Phase III (297) vs. Phase IV (284)		Phase IV (284) vs. Phase I (315)	
		Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls
Case Group	Age	0.009*	0.012*	0.016*	0.017*	0.028*	0.009*	0.026*	0.023*
	Height	0.029*	0.014*	0.3	0.011*	0.009*	0.033*	0.019*	0.11
	Weight	0.037*	0.013*	0.014*	0.042*	0.019*	0.01*	0.009*	0.03*
	MUAC	0.008*	0.029*	0.29	0.012*	0.103	0.01*	0.093	0.087
	TSF	0.024*	0.29	0.003*	0.039*	0.025*	0.037*	0.05*	0.1
	SSF	0.035*	0.03*	0.09	0.04*	0.005*	0.034*	0.001*	0.024*
	BMI	0.013*	0.015*	0.011*	0.043*	0.013*	0.012*	0.017*	0.013*
	Mother's Height	0.024*	0.003*	0.016*	0.014*	0.011*	0.013*	0.002*	0.098
	Mother's weight	0.023*	0.027*	0.3	0.015*	0.003*	0.037*	0.088	0.025*
	Mother's BMI	0.036*	0.026*	0.014*	0.046*	0.096	0.023*	0.096	0.026*

The **Table 3.57** shows that the composition of boys and girls in Phase I vs. Phase II, II vs. III, III vs. IV and IV vs. I among boys and girls of their height, weight, MUAC, TSF,SSF, BMI, mother's height, weight, and BMI were found statistically significant association in Case Group study population. Except among TSF (girls vs. girls), MUAC (boys vs. boys), mother's weight (boys vs. boys), Mother's BMI (boys vs. boys) respectively.

The **Table 3.58** shows that the composition of boys and girls in Phase I vs. Phase II, II vs. III, III vs. IV and IV vs. I among boys and girls of their height, weight, MUAC, TSF,SSF, BMI, mother's height, weight, and BMI were found statistically significant association in Case Group study population. Except among TSF (girls vs. girls), MUAC (boys vs. boys), mother's weight (boys vs. boys), Mother's BMI (boys vs. boys) respectively.

The **Table 3.59** shows that the composition of boys and girls in Phase I vs. Phase II, II vs. III, III vs. IV and IV vs. I among boys and girls of their height, weight, MUAC, TSF,SSF, BMI, mother's height, weight, and BMI were found statistically significant association in Case Group study population. Except among TSF (girls vs. girls), MUAC (boys vs. boys),

Table 3.58: Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case and Control Group Data Overall Anthropometric variables:

Data Status	Variables	Phase I (319) vs. Phase II (240)		Phase II (240) vs. Phase III (230)		Phase III (230) vs. Phase IV (201)		Phase IV (201) vs. Phase I (319)	
		Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls
Control Group	Age	0.114	0.087	0.033*	0.027*	0.017*	0.02*	0.052*	0.00*
	Height	0.033*	0.25	0.01*	0.044*	0.003*	0.079	0.045*	0.033*
	Weight	0.017*	0.098	0.01*	0.031*	0.019*	0.087	0.017*	0.11
	MUAC	0.012*	0.023*	0.037*	0.055*	0.104	0.16	0.111	0.01*
	TSF	0.132	0.011*	0.234	0.033*	0.197	0.04*	0.142	0.037*
	SSF	0.217	0.094	0.112	0.138	0.105	0.05*	0.112	0.34
	BMI	0.11	0.021*	0.213	0.117	0.118	0.13	0.239	0.12
	Mother's Height	0.031*	0.016*	0.037*	0.014*	0.006*	0.08	0.14	0.13
	Mother's weight	0.027*	0.18	0.023*	0.052*	0.107	0.081	0.043*	0.37
	Mother's BMI	0.114	0.087	0.033*	0.027*	0.017*	0.02*	0.052*	0.09

Table 3.59. Composition of Sample of Boys and Girls in Phase I, Phase II, Phase III, and Phase IV of Case and Control Group Data Overall Anthropometric variables:

Data Status	Variables	Phase I (315) vs. Phase I (319)		Phase II (308) vs. Phase II (240)		Phase III (297) vs. Phase III (230)		Phase IV (248) vs. Phase IV (201)	
		Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls	Boys Vs. Boys	Girls Vs. Girls
Case Group Vs. Control Group	Age	0.024*	0.003*	0.016*	0.014*	0.011*	0.013*	0.002*	0.098*
	Height	0.523	0.027*	0.3	0.015*	0.003*	0.037*	0.088*	0.025*
	Weight	0.036*	0.26	0.014*	0.46	0.096*	0.23	0.096*	0.026*
	MUAC	0.34	0.9	0.29	0.32	0.01*	0.7	0.16	0.3
	TSF	0.023*	0.7	0.003*	0.041*	0.026	0.8	0.4	0.18
	SSF	0.38	0.24	0.09	0.047*	0.003*	0.121	0.5	0.27
	BMI	0.037*	0.28	0.011*	0.13	0.15	0.08	1.013	0.7
	Mother’s Height	0.022*	0.025*	0.016*	0.051*	0.56	0.09	1.008	0.19
	Mother’s weight	0.121	0.1	0.033*	0.049*	0.6	0.49	1.09	0.15
	Mother’s BMI	0.033*	0.11	0.008*	0.013*	0.02	0.01*	1.012	0.23

Table 3. 60: Composition of Sample of Mother's in Phase I, Phase II, Phase III, and Phase IV of Case and Control Group Data

Age (years)	Case Group				Control Group			
	Phase I	**Phase II**	**Phase III**	**Phase IV**	**Phase I**	**Phase II**	**Phase III**	**Phase IV**
18-21	44 (13.97)	58 (18.83)	36 (12.12)	38 (13.28)	55 (17.24)	26 (10.83)	25 (10.87)	26 (12.93)
22-25	85 (26.98)	73 (23.70)	67 (22.56)	49 (17.25)	81 (25.39)	48 (20.00)	49 (21.30)	42 (20.89)
26-29	68 (21.58)	57 (18.51)	64 (21.55)	59 (20.77)	68 (21.31)	63 (26.25)	63 (27.39)	53 (26.37)
30-33	54 (17.14)	64 (20.78)	66 (22.22)	64 (22.54)	50 (15.67)	56 (23.33)	50 (21.74)	48 (23.88)
34-37	65 (20.63)	56 (18.18)	64 (21.55)	74 (26.06)	65 (20.38)	47 (19.58)	43 (18.69)	32 (15.92)
	164 (52.06)	151 (47.94)	101 (32.79)	207 (67.21)	164 (51.41)	155 (48.59)	123 (51.25)	117 (48.75)
Total	315 (100)	308 (100)	297 (100)	284 (100)	319 (100)	240 (100)	230 (100)	201 (100)

Pretenses indicate percentage

Table 3.61: Changes in age specific mean of anthropometric variables among Case Group of mother's over four interval study periods.

Age (Years)	Variables	Phase I (315)	Phase II (308)	Phase III (297)	Phase IV (284)	F-value	Sig (p>0.005)
18-21	Height	143.15 ±1.21	143.67±1.10	152.76±1.41	157.37±1.12	10.12*	0.00
	Weight	43.40 ±1.81	43.50±1.86	44.50±1.02	45.60±1.21	7.11*	0.00
	BMI	22.36 ±1.46	23.58±1.38	23.65±1.49	24.05±1.72	5.01*	0.02
	MUAC	39.54 ±1.89	44.93±1.92	44.93±2.60	45.37±2.31	5.32*	0.01
	Triceps	14.33 ±1.78	14.46±1.75	14.60±1.91	14.76±1.97	3.93*	0.01
	Sub scapular	15.80 ±1.83	15.82±1.57	15.97±1.58	16.60±1.07	6.82*	0.00
22-25	Height	143.25 ±1.39	144.11±1.12	153.76±1.41	155.37±1.12	8.11*	0.00
	Weight	43.61±1.81	43.75±1.86	44.63±2.02	45.20±1.21	5.43*	0.00
	BMI	23.36±1.46	23.58±1.38	23.12±1.49	24.05±1.72	2.12	0.11
	MUAC	40.54 ±1.89	41.13±1.92	41.93±1.60	45.17±1.32	3.76*	0.04
	Triceps	14.12±1.78	14.32±0.75	14.42±0.91	14.50±1.77	1.72	1.14
	Sub scapular	15.80±4.83	15.82±1.57	15.97±0.58	16.60±5.07	1.32	2.31
26-29	Height	143.38±4.43	145.61±5.10	146.16±3.41	146.37±4.12	8.34*	0.00
	Weight	43.61±1.81	43.75±1.86	47.63±2.02	49.20±1.21	4.39*	0.03
	BMI	18.36±1.46	20.58±1.38	22.12±1.49	24.05±0.72	3.23*	0.02
	MUAC	39.54±7.89	44.93±2.92	44.93±2.60	45.37±2.31	2.33	1.23
	Triceps	15.33±1.78	15.46±0.75	15.22±1.91	14.12±1.77	1.19	4.33
	Sub scapular	15.80±4.83	14.82±0.57	14.97±0.58	16.11±5.07	2.76	1.26
30-33	Height	144.96±2.12	145.61±5.10	151.76±3.41	154.37±4.12	11.10*	0.00
	Weight	47.61±1.81	47.75±1.86	47.63±2.02	49.20±1.21	6.32*	0.01
	BMI	22.36±1.46	23.58±1.38	22.12±1.49	24.05±1.22	3.21*	0.04
	MUAC	39.54±7.89	44.93±2.92	44.93±2.65	45.37±2.31	2.31	0.17
	Triceps	15.33±1.75	15.46±0.75	15.60±0.91	15.50±1.77	4.32*	0.04
	Sub scapular	15.80±1.83	15.82±1.57	15.97±1.58	16.21±1.17	5.32*	0.05
34-37	Height	144.96±2.12	145.61±5.10	151.76±3.41	154.37±4.12	11.10*	0.00
	Weight	47.61±1.81	47.75±1.86	47.63±2.02	49.20±1.21	6.32*	0.01
	BMI	22.36±1.46	23.58±1.38	22.12±1.49	24.05±1.22	3.21*	0.04
	MUAC	39.54±7.89	44.93±2.92	44.93±2.65	45.37±2.31	2.31	0.17
	Triceps	15.33±1.75	15.46±0.75	15.60±0.91	15.50±1.77	4.32*	0.04
	Sub scapular	15.80±1.83	15.82±1.57	15.97±1.58	16.21±1.17	5.32*	0.05
Total	Height	143.21±1.21	144.61±5.10	147.6±3.41	147.37±4.12	13.22*	0.00
	Weight	47.61±1.81	48.75±1.86	47.63±2.02	49.20±1.21	6.34*	0.01
	BMI	12.36±1.46	12.58±1.38	12.12±1.49	14.05±1.72	3.33	1.12
	MUAC	39.54±7.89	44.93±2.92	44.93±2.60	45.37±2.31	1.75	3.47
	Triceps	15.23±1.76	15.16±1.75	15.60±1.51	14.50±1.77	1.44	5.74
	Sub scapular	15.31±1.83	14.14±1.57	14.97±1.58	16.60±5.07	3.25	2.76

Table 3.62: Changes in age specific mean of anthropometric variables among Case Group of mother's over four interval study periods.

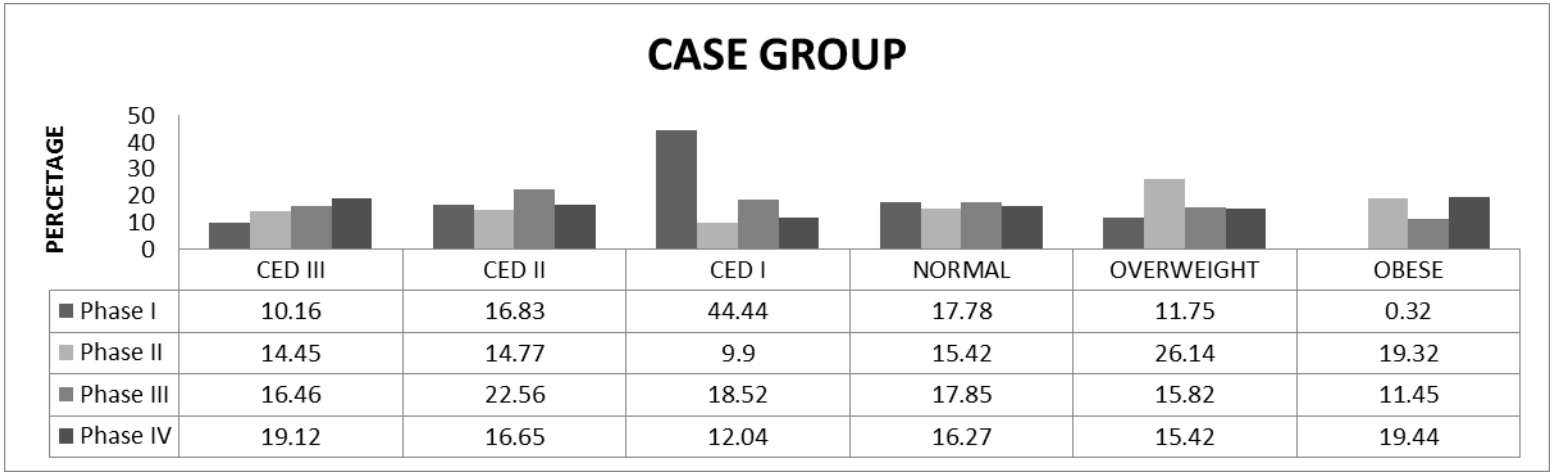
Age (Years)	Variables	Phase I (319)	Phase II (240)	Phase III (230)	Phase IV (201)	F-value	Sig (p>0.005)
18-21	Height	143.15 ±1.21	144.67±1.10	151.76±1.41	155.37±1.12	9.12*	0.00
	Weight	44.40 ±1.81	45.50±1.86	45.50±1.02	45.60±1.21	5.11*	0.00
	BMI	18.36 ±1.46	23.58±1.38	24.54±1.49	24.65±1.72	4.01*	0.02
	MUAC	38.54 ±1.89	46.93±1.92	44.93±2.60	45.37±2.31	5.32*	0.01
	Triceps	14.33 ±1.78	14.46±1.75	14.60±1.91	14.76±1.97	3.93*	0.01
	Sub scapular	15.80 ±1.83	15.82±1.57	15.97±1.58	16.60±1.07	6.82*	0.00
22-25	Height	143.25 ±1.39	145.11±1.12	154.76±1.41	156.37±1.12	8.11*	0.00
	Weight	42.61±1.81	43.75±1.86	44.63±2.02	47.20±1.21	5.43*	0.00
	BMI	23.36±1.46	24.58±1.38	24.12±1.49	24.65±1.72	2.12	0.11
	MUAC	40.54 ±1.89	43.13±1.92	44.93±1.60	45.17±1.32	3.76*	0.04
	Triceps	14.12±1.78	14.32±0.75	14.42±0.91	14.50±1.77	1.72	1.14
	Sub scapular	15.80±1.83	15.82±1.57	15.97±0.58	16.60±1.07	1.32	2.31
	Height	144.38±4.43	145.61±5.10	146.76±3.41	148.37±4.12	7.34*	0.00
	Weight	43.60±1.81	44.75±1.86	47.60±2.02	50.05±1.21	5.39*	0.03
	BMI	19.36±1.46	24.58±1.38	22.12±1.49	23.05±0.72	4.23*	0.02
	MUAC	39.54±1.89	44.12±1.92	44.03±1.60	45.07±2.31	2.33	1.23
	Triceps	15.33±1.78	15.46±0.75	15.22±1.91	14.12±1.77	3.19*	0.03
	Sub scapular	15.80±1.83	14.82±0.57	14.97±0.58	16.11±5.07	2.76	1.26
30-33	Height	144.16±1.12	145.61±1.10	151.76±3.41	154.37±4.12	14.10*	0.00
	Weight	47.61±1.81	47.75±1.86	47.63±2.02	49.20±1.21	6.32*	0.01
	BMI	16.36±1.46	21.58±1.38	22.12±1.49	24.05±1.22	3.21*	0.04
	MUAC	39.54±1.89	44.93±2.92	44.93±2.65	45.37±2.31	2.31	0.17
	Triceps	15.03±1.75	15.46±0.75	15.60±0.91	15.50±1.77	4.32*	0.04
	Sub scapular	15.20±1.83	15.12±1.57	15.01±1.58	16.21±1.17	5.32*	0.05
34-37	Height	144.16±1.12	145.61±1.10	151.76±3.41	154.37±4.12	14.10*	0.00
	Weight	47.61±1.81	47.75±1.86	47.63±2.02	49.20±1.21	6.32*	0.01
	BMI	16.36±1.46	21.58±1.38	22.12±1.49	24.05±1.22	3.21*	0.04
	MUAC	39.54±1.89	44.93±2.92	44.93±2.65	45.37±2.31	2.31	0.17
	Triceps	15.03±1.75	15.46±0.75	15.60±0.91	15.50±1.77	4.32*	0.04
	Sub scapular	15.20±1.83	15.12±1.57	15.01±1.58	16.21±1.17	5.32*	0.05
Total	Height	143.21±1.21	144.61±5.10	145.26±3.41	147.37±4.12	8.22*	0.00
	Weight	47.01±1.81	48.12±1.86	47.03±2.02	49.20±1.21	6.34*	0.01
	BMI	12.36±1.46	12.58±1.38	12.12±1.49	14.05±1.72	2.33	1.02
	MUAC	39.14±7.89	44.93±2.92	43.93±2.60	45.37±2.31	1.75	3.47
	Triceps	15.23±1.76	15.16±1.75	15.20±1.51	14.50±1.77	1.44	5.74
	Sub scapular	15.31±1.83	14.14±1.57	14.97±1.58	16.60±5.07	3.25	2.76

Table 3.63: Different grades of under nutrition (CED) based on BMI among the mother

GRADE	BMI kg/m2	Phase I		Phase II		Phase III		Phase IV		X^2 analysis	
		Case (315)	Control (319)	Case (308)	Control (240)	Case (297)	Control (230)	Case (284)	Control (201)		
CED III	BMI > 16.00	30 (10.16)	40 (12.70)	44 (14.45)	34 (14.17)	37 (16.46)	31 (13.48)	54 (19.12)	26 (12.94)	12.69*	0.05
CED II	BMI 16.00-16.99	53 (16.83)	63 (20.00)	45 (14.77)	42 (17.50)	67 (22.56)	42 (18.26)	47 (16.65)	37 (18.41)	16.20**	0.02
CED I	BMI 17.00-18.49	140 (44.44)	55 (17.46)	33 (9.90)	38 (15.83)	55 (18.52)	34 (14.78)	34 (12.04)	29 (14.43)	63.01**	0.00
Normal	BMI 18.50-24.90	56 (17.78)	50 (14.60)	47 (15.42)	30 (12.50)	53 (17.85)	43 (18.70)	46 (16.27)	39 (19.40)	5.86*	0.05
Overweight	25.00-29.9	35 (11.75)	64 (20.32)	80 (26.14)	51 (21.25)	47 (15.82)	45 (19.57)	48 (15.42)	40 (19.90)	22.18**	0.00
Obese	30 & above	1 (0.32)	47 (14.92)	59 (19.32)	45 (18.75)	38 (11.45)	35 (15.22)	55 (19.44)	30 (14.93)	33.67**	0.00

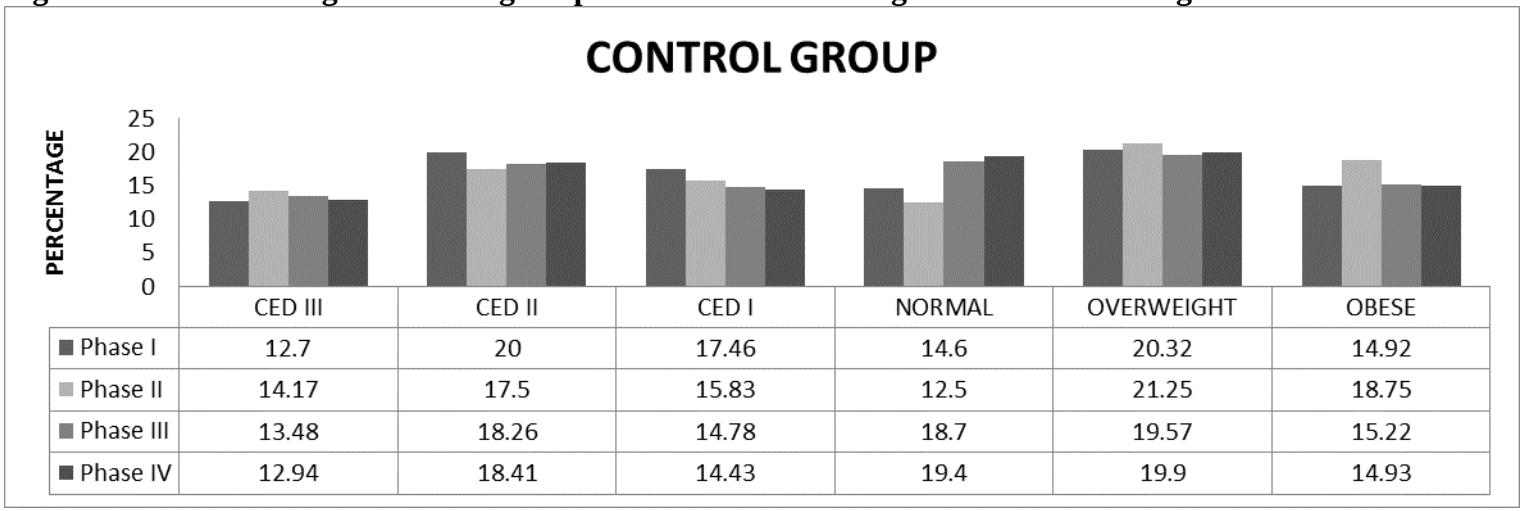
Figure in parenthesis indicate percentage

Figure: 3. 19. Bar diagram showing the prevalence of different grades of CED among mothers



	CED III	CED II	CED I	NORMAL	OVERWEIGHT	OBESE
Phase I	10.16	16.83	44.44	17.78	11.75	0.32
Phase II	14.45	14.77	9.9	15.42	26.14	19.32
Phase III	16.46	22.56	18.52	17.85	15.82	11.45
Phase IV	19.12	16.65	12.04	16.27	15.42	19.44

Figure: 3.19.A: Bar diagram showing the prevalence of different grades of CED among mothers



	CED III	CED II	CED I	NORMAL	OVERWEIGHT	OBESE
Phase I	12.7	20	17.46	14.6	20.32	14.92
Phase II	14.17	17.5	15.83	12.5	21.25	18.75
Phase III	13.48	18.26	14.78	18.7	19.57	15.22
Phase IV	12.94	18.41	14.43	19.4	19.9	14.93

Changes in age specific mean of anthropometric variables among Case Group of Mother's over four interval study periods.

Table 3.61 shown among mothers age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.25±1.39, 144.11±1.12, 153.76±1.58 and 155.37±1.12 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.38±4.43, 145.61±5.10, 153.76±1.41 and 155.37±1.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.96±2.12, 145.61±5.10, 151.76±3.41 and 154.37±3.41. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.21±1.21, 144.61±5.10, 147.6±3.41 and 147.37±4.12 respectively. Among mothers those were belong to Control Group of mean height between studies Phase I, Phase II, Phase III and Phase IV Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.25±2.21, 144.67±1.10, 150.16±2.41 and 153.17±3.12 among age 18-23 years.145.11±3.21,145.41±3.32, 151.26±3.58 and 152.32±3.21 among age 24-29 years. Of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.38±3.43, 145.62±4.10, 153.76±3.41 and 155.37±3.12 among age Group 30-35 years of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.96±2.12, 146.61±5.10, 154.76±3.01 and 157.17±3.61. The overall mean and standard deviation of mothers was depicted 144.31±1.21, 145.16±3.10, 146.6±3.31 and 146.17±4.31 respectively.

The mean weight between studies Phase I, Phase II, Phase III and Phase IV of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 43.40±2.81, 43.50±1.86, 44.50±1.02 and 45.60±1.21 among age 18-23 years Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 43.61±1.81, 43.75±1.86, 44.63±2.02 and 45.20±1.38 among age 24-

29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 43.61±1.81, 43.75±1.86, 47.63±2.14 and 49.20±2.14 among age Group 30-35 years of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 47.61±1.81, 47.75±2.11, 47.63±2.02 and 49.20±1.21 among age Group 36-40 years. The overall mean and standard deviation of mothers was depicted of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 47.61±1.81, 48.75±1.86, 47.63±2.02 and 49.20±1.21 respectively.

Among mothers those were belong to Control Group of mean weight between studies Phase I, Phase II, Phase III and Phase IV are 44.40±2.14, 45.50±2.52, 45.50±1.02 and 45.60±1.21 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 42.61±3.21, 43.75±2.20, 44.63±2.02 and 47.20±1.21 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 43.60±3.13, 44.75±2.54, 47.60±2.02 and 50.05±3.47 among age Group 30-35 years of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 45.21±2.12, 45.87±5.10, 46.71±3.01 and 47.58±3.61. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 44.31±3.24, 45.16±3.14, 46.18±3.31 and 47.21±4.31 respectively.

The mean body mass index (BMI) between studies Phase I, Phase II, Phase III and Phase IV of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 18.63±1.46, 23.58±1.38, 24.54±1.49 and 24.65±1.72 among age 18-23 years. 23.36±1.52, 24.58±1.21, 24.12±3.41 and 24.65±2.54 among age 24-29 years. Of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 19.36±4.13, 24.58±5.10, 22.12±1.49 and 23.05±1.12 among age Group 30-35 years of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 16.36±1.46, 21.58±1.38, 22.12±3.41 and 24.05±1.22. The overall mean and

standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 23.77±1.26, 12.58±2.10, ±3.41 and 147.37±4.12 respectively.

Among mothers those were belong to Control Group of mean body mass index (BMI) between studies Phase I, Phase II, Phase III and Phase IV are Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.25±2.21, 144.67±1.10, 150.16±2.41 and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 153.17±3.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.11±3.21, 145.41±3.32, 151.26±3.58 and 152.32±3.21 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.38±3.43, 145.62±4.10, 153.76±3.41 and 155.37±3.12 among age Group 30-35 years and 145.96±2.12, 146.61±5.10, 154.76±3.01 and 157.17±3.61. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular is 144.31±1.21, 145.16±3.10, 146.6±3.31 and 146.17±4.31 respectively.

The mean mid upper arm circumference (MUAC) between studies Phase I, Phase II, Phase III and Phase IV are Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.15±1.21, 143.67±1.10, 152.76±1.41 and 157.37±1.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.25±1.39, 144.11±1.12, 153.76±1.58 and 155.37±1.12 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.38±4.43, 145.61±5.10, 153.76±1.41 and 155.37±1.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.96±2.12, 145.61±5.10, 151.76±3.41 and 154.37±3.41. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.21±1.21, 144.61±5.10, 147.6±3.41 and 147.37±4.12 respectively.

Among mothers those were belong to Control Group of mean mid upper arm circumference (MUAC) between studies Phase I, Phase II, Phase III and Phase IV are Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.25±2.21, 144.67±1.10, 150.16±2.41 and 153.17±3.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.11±3.21, 145.41±3.32, 151.26±3.58 and 152.32±3.21 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.38±3.43, 145.62±4.10, 153.76±3.41 and 155.37±3.12 among age Group 30-35 years and 145.96±2.12, 146.61±5.10, 154.76±3.01 and 157.17±3.61. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.31±1.21, 145.16±3.10, 146.6±3.31 and 146.17±4.31 respectively.

The mean triceps between studies Phase I, Phase II, Phase III and Phase IV are Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.15±1.21, 143.67±1.10, 152.76±1.41 and 157.37±1.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.25±1.39, 144.11±1.12, 153.76±1.58 and 155.37±1.12 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.38±4.43, 145.61±5.10, 153.76±1.41 and 155.37±1.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.96±2.12, 145.61±5.10, 151.76±3.41 and 154.37±3.41. The overall mean and standard deviation of mothers was depicted 143.21±1.21, 144.61±5.10, 147.6±3.41 and 147.37±4.12 respectively.

Among mothers those were belong to Control Group of mean triceps between studies Phase I, Phase II, Phase III and Phase IV of Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.25±2.21, 144.67±1.10, 150.16±2.41 and 153.17±3.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.11±3.21, 145.41±3.32, 151.26±3.58 and 152.32±3.21 among age 24-29 years. Height, weight, MUAC,

BMI, MUAC, Triceps and Subscapular 145.38±3.43, 145.62±4.10, 153.76±3.41 and 155.37±3.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.96±2.12, 146.61±5.10, 154.76±3.01 and 157.17±3.61. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.31±1.21, 145.16±3.10, 146.6±3.31 and 146.17±4.31 respectively.

The mean sub-scapular between studies Phase I, Phase II, Phase III and Phase IV are Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.15±1.21, 143.67±1.10, 152.76±1.41 and 157.37±1.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 143.25±1.39, 144.11±1.12, 153.76±1.58 and 155.37±1.12 among age 24-29 years. 143.38±4.43, 145.61±5.10, 153.76±1.41 and 155.37±1.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.96±2.12, 145.61±5.10, 151.76±3.41 and 154.37±3.41. The overall mean and standard deviation of mothers was depicted 143.21±1.21, 144.61±5.10, 147.6±3.41 and 147.37±4.12 respectively.

Among mothers those were belong to Control Group of mean sub-scapular between studies Phase I, Phase II, Phase III and Phase IV are 144.25±2.21, 144.67±1.10, 150.16±2.41 and 153.17±3.12 among age 18-23 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.11±3.21, 145.41±3.32, 151.26±3.58 and 152.32±3.21 among age 24-29 years. Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.38±3.43, 145.62±4.10, 153.76±3.41 and 155.37±3.12 among age Group 30-35 years and Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 145.96±2.12, 146.61±5.10, 154.76±3.01 and 157.17±3.61. The overall mean and standard deviation of mothers was depicted Height, weight, MUAC, BMI, MUAC, Triceps and Subscapular 144.31±1.21,

145.16±3.10, 146.6±3.31 and 146.17±4.31 respectively. The result shows that among mothers in each Phase represented in **Table 3.61** and **3.62**.

Prevalence of different grades of under nutrition (CED) in mothers based on BMI:

To estimate the prevalence of under nutrition among mother different grade of under nutrition (CED) was utilized (WHO report 1996). Then the differences are found among mothers in Case of different Phases (I, II, III, IV) in Case and Control study. CED grade-III was found 12.95%, 11.01%, 12.21% and 11.20% among mothers belong to Case Group and 14.84%, 19.22%, 14.29%, 9.50% among mothers belong to Control Group. CED grade-II was found 16.63%, 20.63%, 20.99%, 15.60% among mother belong to Case Group and 15.08%, 16.73%, 17.46%, 7.00% among mothers belong to Control Group. CED grade -I was 31.87%, 16.82%, 17.94%, 12.40% and 11.44%, 16.37%, 15.87%, 17.50% among mothers belong to Control Group respectively. In population some normal, overweight and obese mothers were also foUnder-weight X^2analysis is found to be significant association between these comparative studies. The result shows that among mothers in each Phase represented in **Table 3.64** And **3.65**.

Logistic regression (Stepwise logistic regression) analysis among maternal anthropometric characters (independent variables) with children Z-score indices:

The most notable findings were that the variables were significantly related to Mother's BMI. Stepwise multiple dependent variables was fitted for mother's BMI as independent variables was constant for all the dependent variables of children z-score (i.e. HAZ, WAZ, WHZ and BMIZ) depicted in **Table**: **3.66 and 3.67.** Results reveal that the BMI is most important predictor variable of HAZ, WAZ and BMIZ. Maternal BMI (Model 1) explained for Case Group in Phase I the result shows that 61.70%, 50.2% and 61.80%

variation of these three dependent variables except 23.60% for WHZ. There is a significant (t) association between maternal BMI with children HAZ, WAZ and BMIZ except WHZ. For Control Group 51.40%, 40.20%, 24.20% and 32.80% variation. In Phase II for Case Group 71.90%, 50.10% and 61.10% variation except WHZ (12.60%) respectively. For Control Group 70.9%, 50.1%, 74.8% except WHZ (28.6%) similar to earlier Case Group. In Phase III 68.9%, 4.10%, 30.0% and 72.8% and in Control Group found 60.9%, 61.2%, 29.6% and 76.8% variation foUnder-weight At Phase IV in Case Group 69.1%, 66.2% 46.4% and 64.8%. For Control Group 65.9%, 55.1%, 30.6% and 72.8% respectively.

Figure 3.19.3. Explained the prevalence of different grade of CED among mothers belong to Phase I, Phase II, Phase III and Phase IV of Case Group. Figure 2 is also explained the prevalence of different grade of CED among mothers belong to Phase I, Phase II, Phase III and Phase IV of Control Group. The prevalence of CED grade III is higher among Phase I of Case Group is 32.00 percent. But among Phase II only 19.00 respectively.

Table 3.64: Regression analysis of maternal anthropometric characteristics (independent variables) with children Z-score; Weight-for –age Z-score (WAZ), Height-for-age Z-score (HAZ), Weight-for-height Z-score (WAZ) and BMI-for-age Z-score (BMIAZ).

PHASE I								
Study	**Model**	**Dependent Variable**	**Independent variable**	**B**	**SEB**	**t**	**Sig.**	**Adj.R2**
Case Study (315)	1	**HAZ**	Constant (Mother's BMI)	-3.97 1.31	0.46 0.21	-12.095 6.51	.000** .000	.617
	1	**WAZ**	Constant (Mother's BMI)	-2.27 0.64	1.53 0.46	-2.103 1.35	.005* .121	.502
	1	**WHZ**	Constant (Mother's BMI)	-1.31 1.49	1.17 0.55	-1.253 2.72	.804 .013	.236
	1	**BMIZ**	Constant (Mother's BMI)	-5.75 0.36	0.430 0.19	-13.185 2.18	.000** .000	.618
Control Study (319)	1	**HAZ**	Constant (Mother's BMI)	-1.973 1.34	0.456 0.21	-11.095 1.50	.000** .000	.514
	1	**WAZ**	Constant (Mother's BMI)	-3.169 0.64	1.053 0.43	-2.103 1.35	.005* .185	.102
	1	**WHZ**	Constant (Mother's BMI)	-5.307 1.49	1.217 0.54	-0.253 2.72	.004* .081	.242
	1	**BMIZ**	Constant (Mother's BMI)	-4.475 1.36	0.430 0.19	-12.185 0.18	.000** .000	.328

*p>0.05, **

Table 3.65. Regression analysis of maternal anthropometric characteristics (independent variables) with children Z-score; Weight-for –age Z-score (WAZ), Height-for-age Z-score (HAZ), Weight-for-height Z-score (WHZ) and BMI-for-age Z-score (BMIAZ).

PHASE II								
Study	**Model**	**Dependent Variable**	**Independent variable**	**B**	**SEB**	**t**	**Sig.**	**Adj.R2**
Case Study (308)	1	**HAZ**	Constant (Mother's BMI)	-1.93 1.06	0.02 0.20	-13.09 4.12	.000** .000	.719
	1	**WAZ**	Constant (Mother's BMI)	-2.69 0.42	1.05 0.46	-3.103 1.51	.007* .185	.501
	1	**WHZ**	Constant (Mother's BMI)	-3.17 1.94	1.01 0.53	-0.253 2.26	.804 .013	.126
	1	**BMIZ**	Constant (Mother's BMI)	-1.75 1.37	0.03 0.15	-13.15 7.11	.000** .000	.611
Control Study (240)	1	**HAZ**	Constant (Mother's BMI)	-5.73 1.06	0.45 0.21	-13.05 6.510	.000** .000	.709
	1	**WAZ**	Constant (Mother's BMI)	-3.269 0.642	1.05 0.31	-3.103 1.385	.007* .185	.051
	1	**WHZ**	Constant (Mother's BMI)	-0.307 1.494	1.217 0.43	-1.253 2.792	.804 .013	.286
	1	**BMIZ**	Constant (Mother's BMI)	-5.675 1.357	0.430 0.19	-13.185 7.168	.000** .000	.748

*p>0.05, **p>0.01

Table 3.66: Regression analysis of maternal anthropometric characteristics (independent variables) with children Z-score; Weight-for –age Z-score (WAZ), Height-for-age Z-score (HAZ), Weight-for-height Z-score (WHZ) and BMI-for-age Z-score (BMIAZ).

PHASE III								
Study	**Model**	**Dependent Variable**	**Independent variable**	**B**	**SEB**	**t**	**Sig.**	**Adj.R2**
Case Study (297)	1	HAZ	Constant (Mother' BMI)	-6.973 2.06	0.55 0.30	-10.09 6.10	.000** .000	.689
	1	WAZ	Constant (Mother's BMI)	-2.10 0.64	1.03 0.43	-2.10 1.81	.002* .175	.041
	1	WHZ	Constant (Mother's BMI)	-1.21 1.29	1.17 0.535	-0.53 2.72	.404 .013	.286
	1	BMIZ	Constant (Mother's BMI)	-3.62 1.35	0.20 0.02	-13.15 7.168	.000** .000	.728
Control Study (230)	1	HAZ	Constant (Mother's BMI)	-4.973 1.30	0.36 0.01	-13.05 6.10	.000** .000	.609
	1	WAZ	Constant (Mother's BMI)	-5.269 0.64	1.03 0.48	-3.10 1.385	.000* .000	.612
	1	WHZ	Constant (Mother's BMI)	-0.27 1.49	1.27 0.35	-0.25 2.792	.004** .013	.286
	1	BMIZ	Constant (Mother's BMI)	-3.67 1.35	0.43 0.19	-13.18 6.16	.000** .000	.748

*p>0.05, **p>0.01

Table 3.67. Regression analysis of maternal anthropometric characteristics (independent variables) with children Z-score; Weight-for –age Z-score (WAZ), Height-for-age Z-score (HAZ), Weight-for-height Z-score (WHZ) and BMI-for-age Z-score (BMIAZ).

PHASE IV								
Study	**Model**	**Dependent Variable**	**Independent variable**	**B**	**SEB**	**t**	**Sig.**	**Adj.R2**
Case Study (284)	1	HAZ	Constant (Mother's BMI)	-3.93 1.306	0.56 0.201	-13.05 6.510	.000** .000	.709
	1	WAZ	Constant (Mother's BMI)	-5.29 0.642	1.05 0.463	-3.10 1.85	.000* .000	.662
	1	WHZ	Constant (Mother's BMI)	- 4.307 1.494	1.27 0.535	-0.253 2.792	.000** .001	.464
	1	BMIZ	Constant (Mother's BMI)	-5.65 1.357	0.40 0.189	-13.185 7.168	.000** .000	.848
Control Study (201)	1	HAZ	Constant (Mother's BMI)	-5.93 1.306	0.456 0.201	-14.095 6.510	.000** .000	.659
	1	WAZ	Constant (Mother's BMI)	-3.29 0.642	1.053 0.463	-3.103 1.385	.000** .185	.551
	1	WHZ	Constant (Mother's BMI)	-0.37 1.14	1.17 0.35	-0.253 2.792	.003** .013	.216
	1	BMIZ	Constant (Mother's BMI)	-5.75 1.37	0.40 0.189	-14.185 7.168	.000** .000	.728

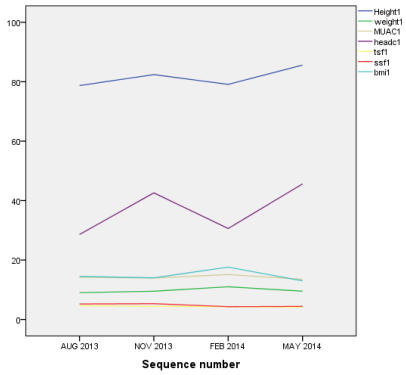
*p>0.05, **p>0.01

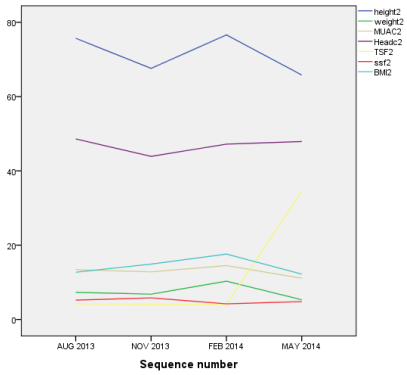
Times series of the data

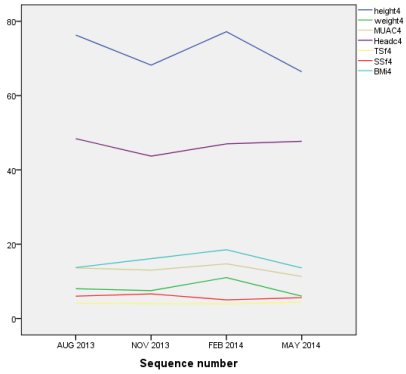
A Time Series of the longitudinal data (Case and Control) were performed. These are graphically represented below:

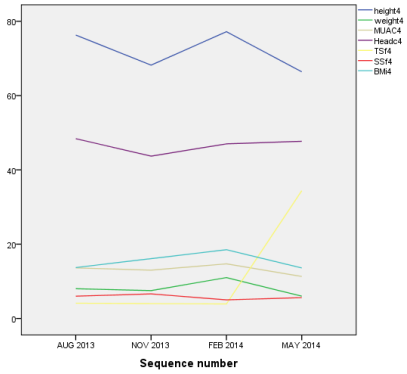
3.36 Time series comparison of Data present in whole Phases of Case and Control Group (Pure Longitudinal Data)

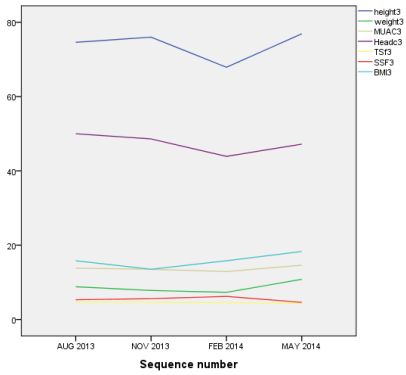
Control



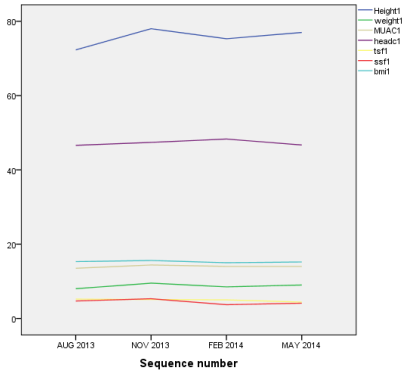








Case Group: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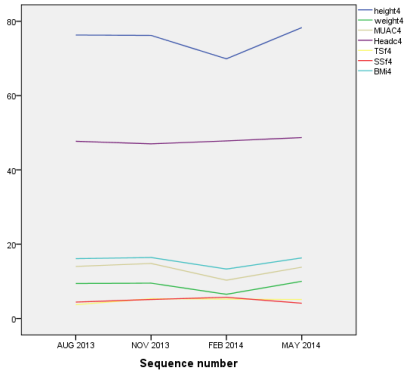
MAY 2014
Sequence number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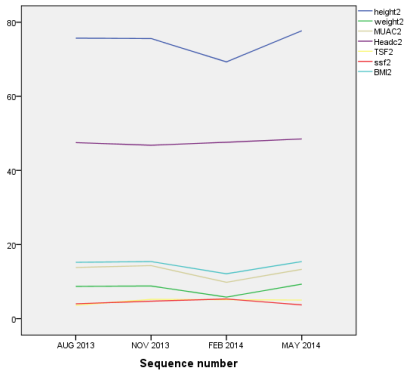
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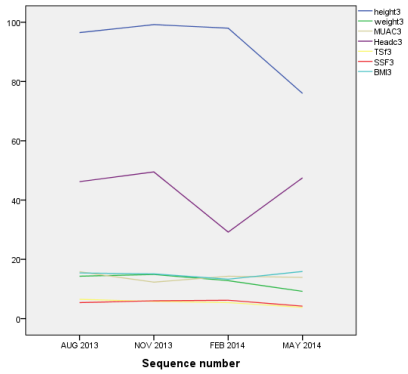
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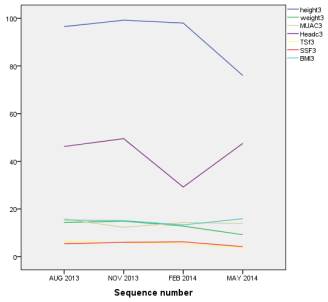
Sequence number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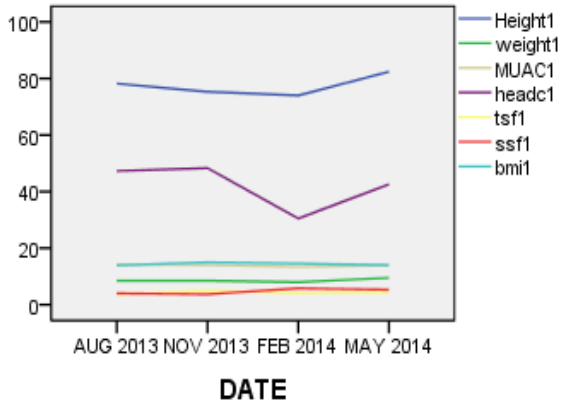
TSf3
SSF3
BMI3
AUG 2013
NOV 2013
FEB 2014
MAY 2014
Sequence number

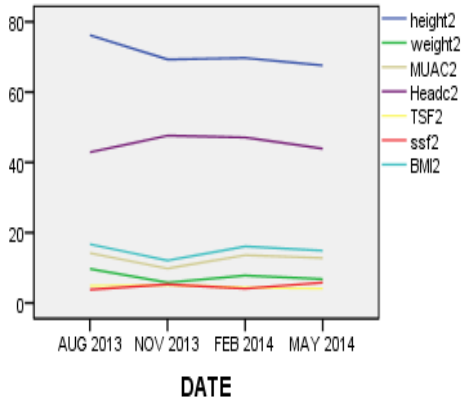
3.37 Figure:A. The time series of different Phases of study shows the growth and nutritional status among children (Case and Control Group study of overall cross-sectional Data).

<u>Case Group Boys</u>

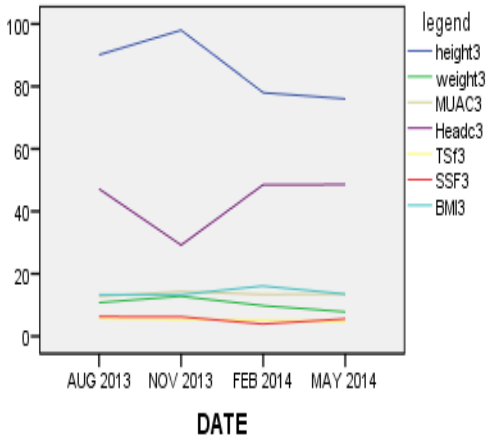
Case Phase I: Boys



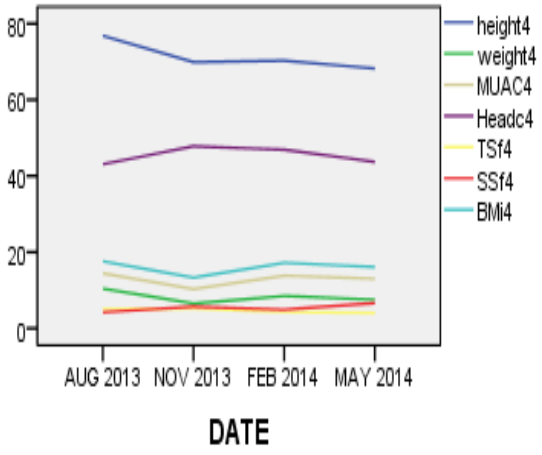
Case Phase II: Boys



Case Phase III: Boys

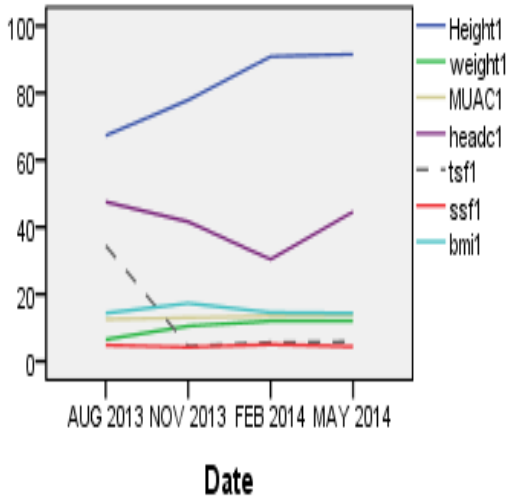


Case IV: Boys

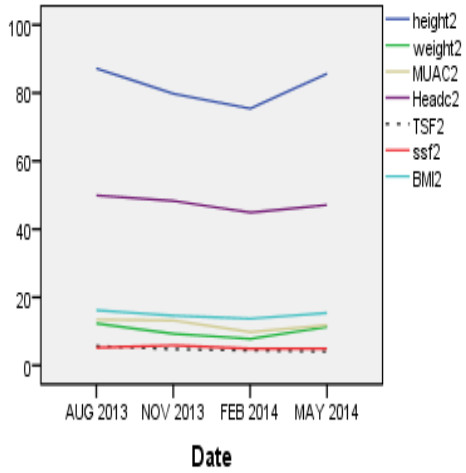


Case Group Girls

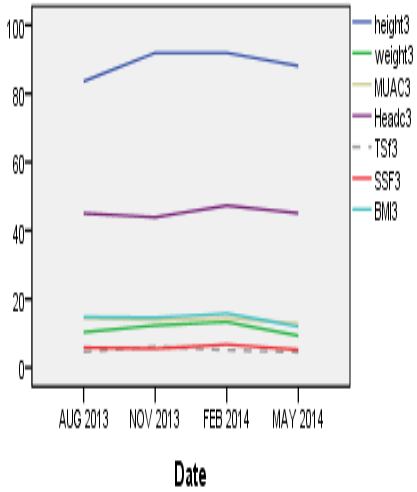
Case I Girls



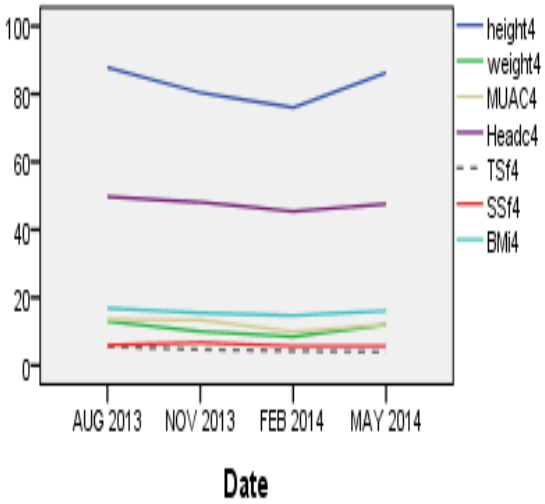
Case II Girls



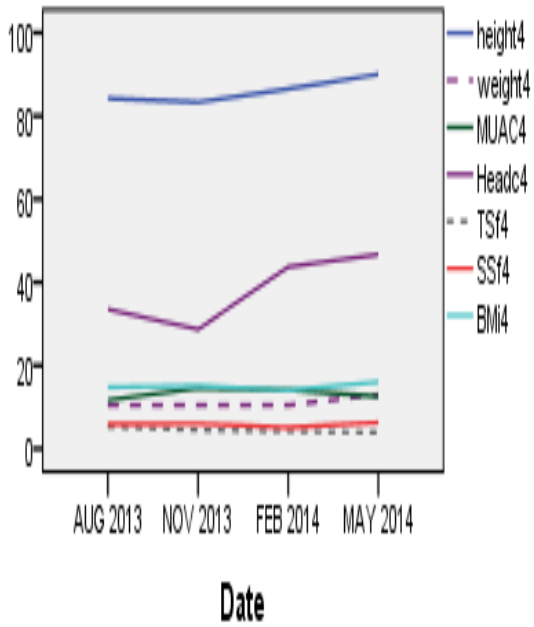
Case III Girls

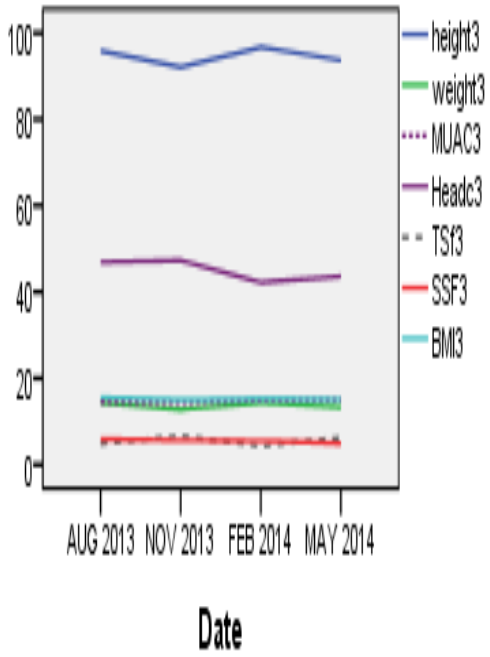


Case IV Girls



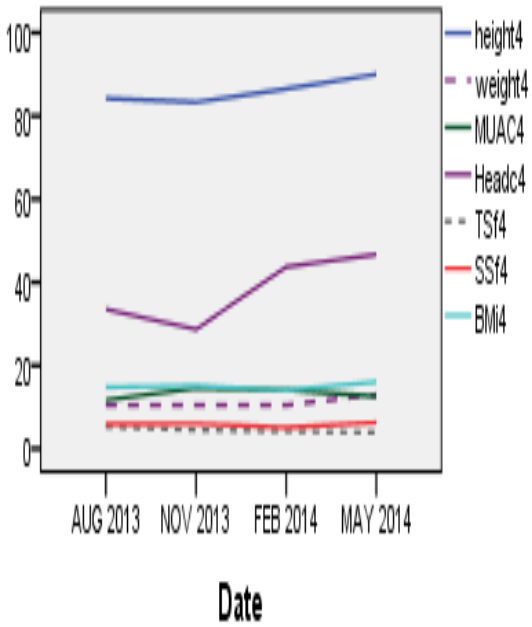
Control Phase I boys *Control Phase II boysControl Phase III boys* *Control Phase IV*

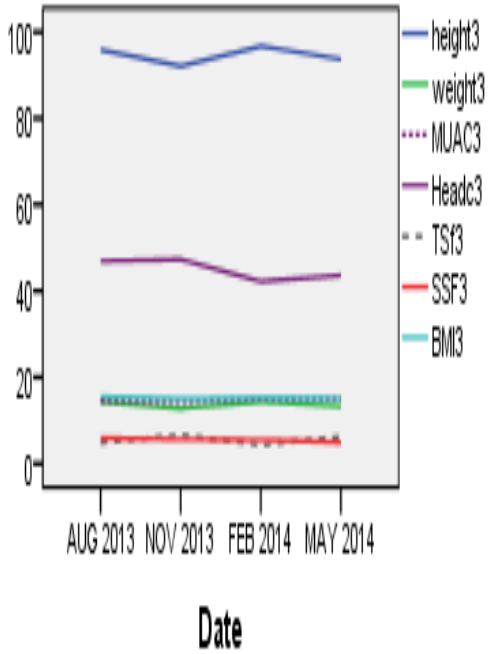




boys

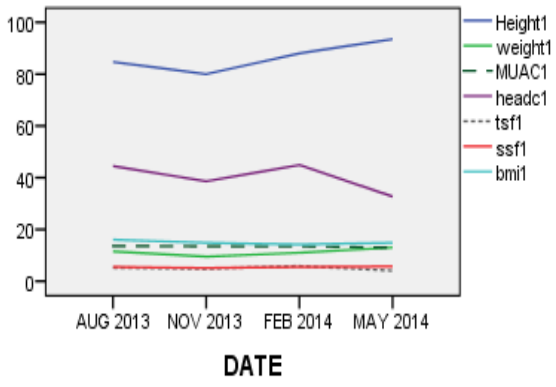
Control Phase I boys *Control Phase II boysControl Phase III boys* *Control Phase IV boys*

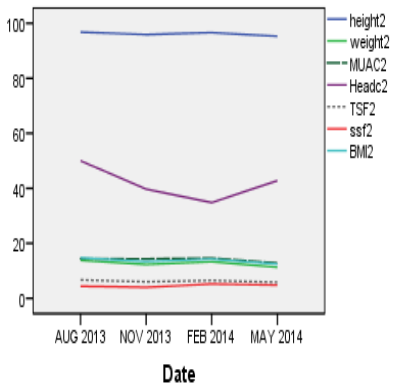




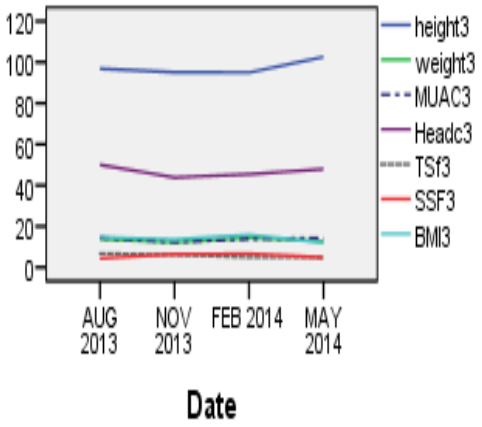
Control Group Girls :

Control Phase I girls *Control Phase II girls*





Control Phase III girls *Control Phase IV girls*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MAY 2014
Date
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weight3
MUAC3
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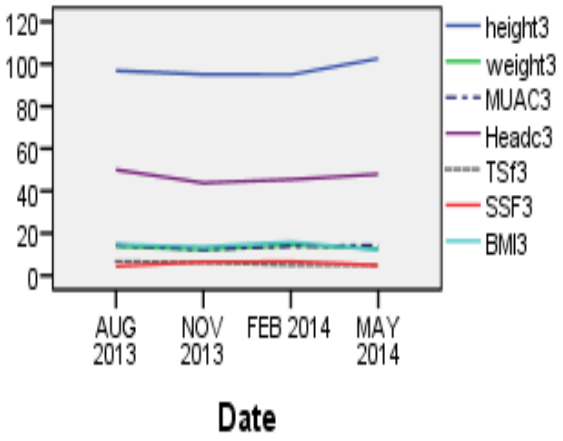
TSf3
SSF3
BMI3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MUAC3
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TSf3
SSF3
BMI3