CHAPTER IV

RESEARCH RESULTS

A cross sectional, analytic study was conducted to ascertain nutritional status with school snack program and without school snack program and to identify other determinants of nutritional status in public primary school children in Jati Asih subdistrict, Bekasi Indonesia in February 2005.

Three hundred children and their mothers were selected as subjects for this study. Among them there was 1 child 's father had died.

Descriptive statistic were used to tabulate general characteristics of children and their mother's food practice and knowledge. Chi-square statistic and T Test were used to test Bivariate associations among independent and dependent variables. Result of this study are presented in four parts.

1) General characteristics of children

2) Socio-demographic characteristics of parent, School snack program, household possession, source of information about nutrition and health, mother's food practice and mother's food knowledge

3) Nutritional status of children

4) Association between nutritional status of children and school snack program and other possible determinants.

4.1 General Characteristics of Children

Three hundred children who are enrolled from four public primary schools in jati Asih sub district Bekasi Indonesia were included in the study. General characteristics of children are presented in Table 4.1 to 4.5 below

Table 4.1: Frequency and percentages of children by age and gender

Age	Male	%	Female	%	Total	%
7	65	33.7	32	92.9	97	32.3
8	58	30.1	46	43.0	104	34.7
9	42	21.8	15	14.0	57	19.0
10	28	1.5	14	13.1	42	14.0
Total	**193**	**100.0**	**107**	**100.0**	**300**	**100.0**

Table 4.1. above shows that 97 children are 7 years old, 104 children are 8 years old, 57 children are 9 years old, 42 children are 10 years old. The counts of boys were higher than girls in every group of age. In all, there were 193 boys (65.7%) and 107 girls (34.3%) in this study.

Table 4.2: Frequency and Percentage of Children by family size in their household

Family size	Frequency	Percentage
3-5 persons	215	71.7
6-8 persons	73	24.3
9-12 persons	12	4
Total	300	100

Table 4.2.above shows that percentage of the family which had total number 3-5 persons was highest at 71.7 % and the lowest was the family with total number of persons 9-12 at 4%.
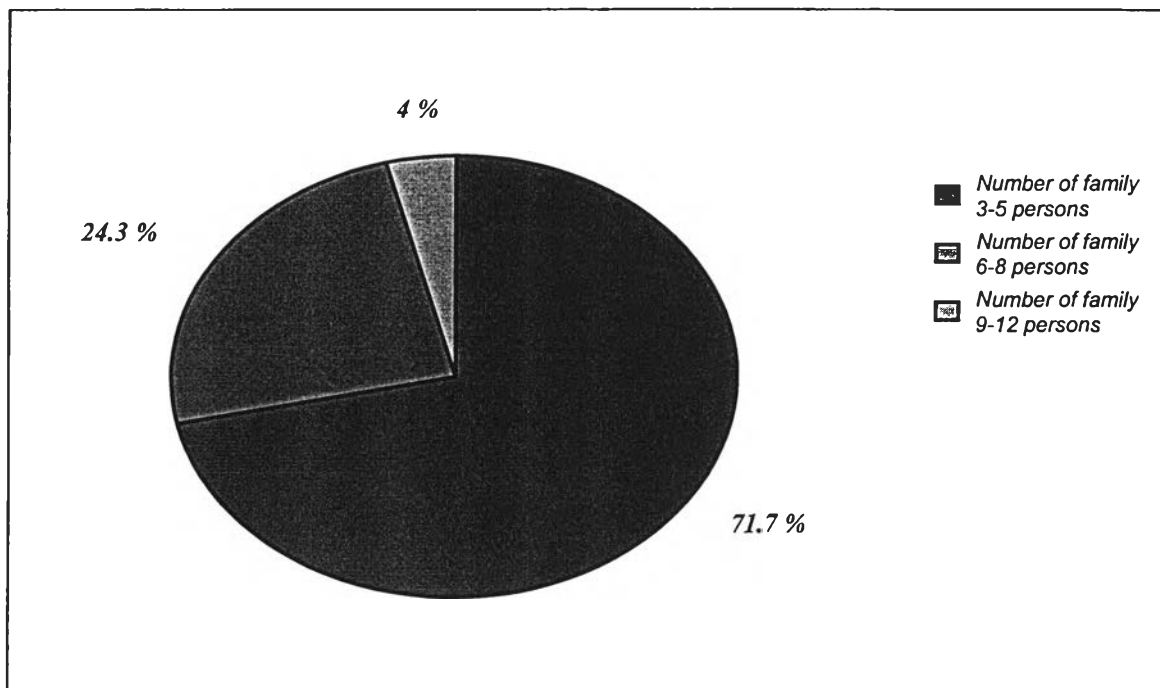
Figure 4.1: Distribution of total number of family in household

Table 4.3:   Frequency and Percentage of children by having any illness within 4 weeks

Having Illness	Diarrhea	Percentage	Fever	Percentage	Coughing	Percentage
Yes	49	16.3	106	35.3	122	40.7
No	251	83.7	194	64.7	178	60.3
TOTAL	300	100.0	300	100.0	300	100.0

Table 4.4 above describes in detail about children by having any illness within 4 weeks, less than half of them got any illness and remaining have no any disease.

Table 4.4:   Frequency and Percentage of children by usually having breakfast

Status of having breakfast	Frequency	Percentage
Yes	201	67.0
No	99	33.0
Total	300	100.0

Table 4.4 above shows that 67% of children usually had breakfast and 33% had not breakfast.

Table 4.5:   Frequency and percentage of children by exercise status within last 7 days

Exercise status	Frequency	Percentage
Yes	250	83.4
No	50	16.6
Total	300	100.0

Table 4.5 above shows large majority of children (83.4) walked to school or rode bicycles. And only 16.6% of children went to schools by their parent.

## 4.2 Socio Demographic Characteristics of Children's Family

Parents of children were described by age, education, occupation, religion, giving breast feeding when their children were small, and Sanitary facility in their home and also food's practice and food's knowledge of their mother. Characteristics of parents are presented in Table 4.6 to Table 4.19

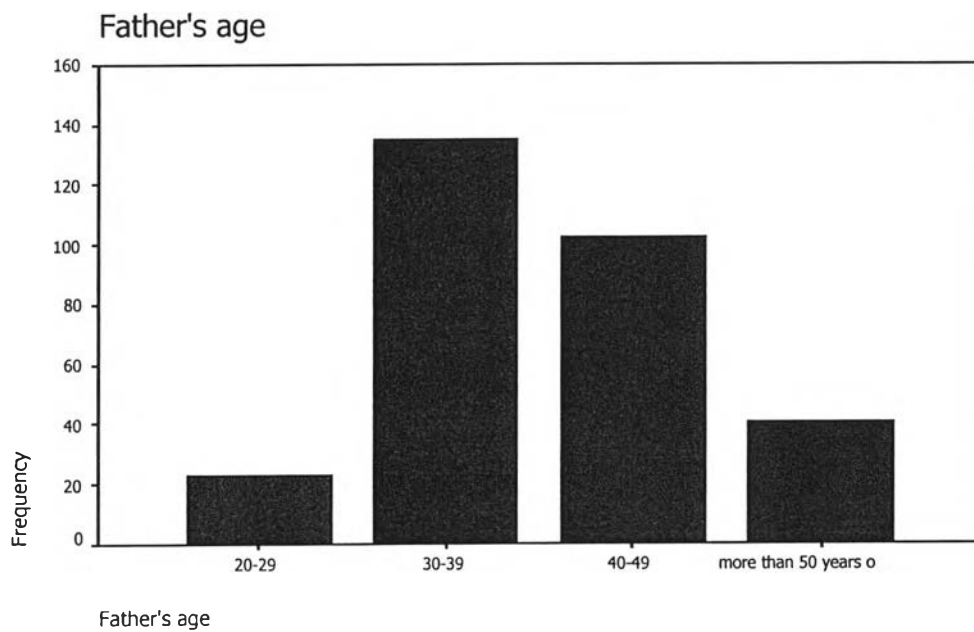**Table 4.6   Frequency and Percentage of Mothers by Age**

Age of mother	Frequency	Percentage
20-29	86	28.7
30-39	138	46.0
40-50	76	25.3
Total	300	100
Mean = 34.08	SD = 6.697	Min=21 Max=50

Table 4.7:   Frequency and Percentage of Fathers by Age

Age Of father	Frequency	Percentage
20-29	23	7.7
30-39	135	45.0
40-49	102	34.0
More than 50	39	13.3
Total	300	100.0
Mean = 39.48	SD= 7.923	Min=25 Max=70
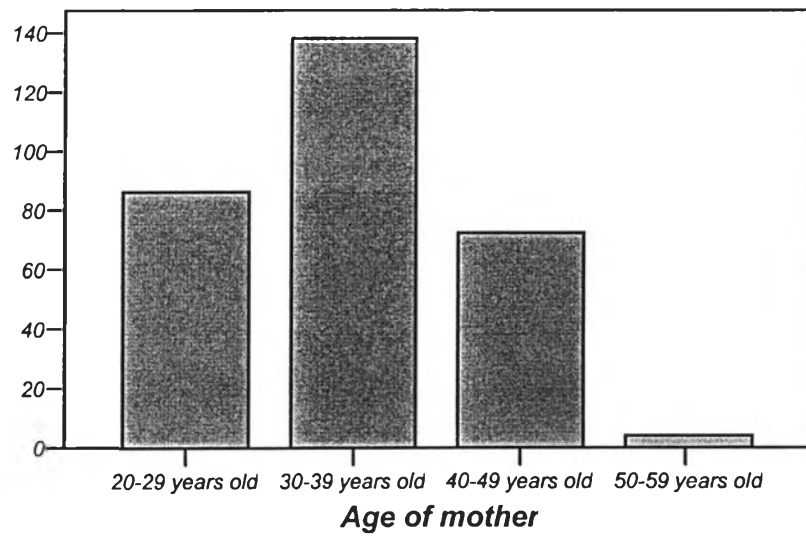
Figure 4.2: Distribution of Mother's Age

Figure 4.3: Distribution of Father's Age

Table 4.8: **Frequency and Percentage of mother by education**

Mother's Education	Frequency	Percentage
No School	76	25.3
Primary school	122	40.7
Secondary school	26	8.7
Above Senior high school	76	25.3
Total	300	100.0

Table 4.8 above describes in detail about mother's education. There were 25.3% mother of children who had not education, 40.7% passed from primary school, 8.7% passed secondary school, 23.7% passed senior high school, and only 1.7% had higher education. In term of mother's education, percentages of mother who had education from primary school were highest, and percentages of mother who had education more than senior high school were lowest.

Table 4.9: **Frequency and percentage of father by education**

Father's education	Frequency	Percentage
No school	34	11.4
Primary school	85	28.4
Secondary school	72	24.1
Above Senior high school	108	36.1
Total	299	100.0

Table 4.10: Frequency and percentage of mother by occupation

Mother's occupation	Frequency	Percentage
Housewife	262	87.0
working	38	23.0
Total	300	100.0

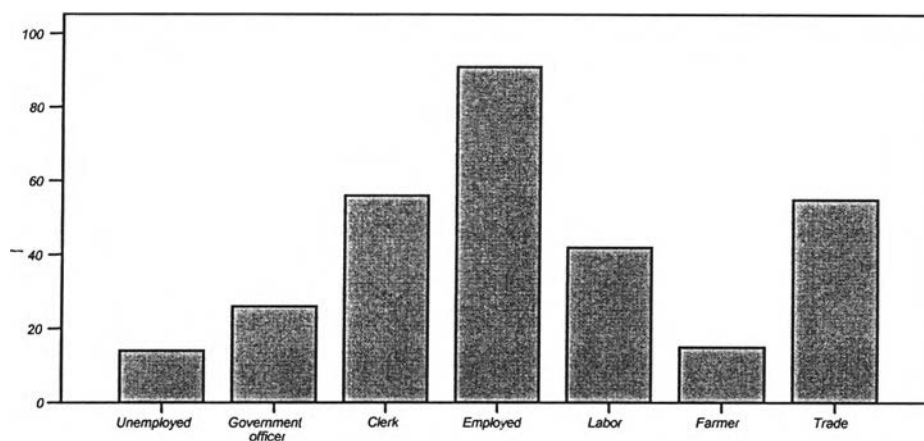Table 4.11: Frequency and Percentage of Father by Occupation

Father's Occupation	Frequency	Percentage
Unemployed	14	4.7
Government Officer	26	8.7
Clerk	56	1.7
Employed	91	30.3
Laborer	42	14.0
Farmer	15	5.0
Trade	55	18.3
Total	299	99.7
Missing system	1	0.3
Total	300	100.0

Table 4.12: Frequency and percentage of father by income level

Father's Occupation*	Frequency	Percentage
Low	14	4.7
Middle	203	67.9
High	82	27.4
Total	299	100.0

* Father's occupation was classified into three categories such as 1) High : Government officer, Clerk, 2) Middle: Employed, laborer, Farmer, Trade, 3) Low : Unemployed.

Figure 4.4 Distribution of father's occupation

Table 4.13: Frequency and percentage of family by religion

Religion	Frequency	Percentage
Muslim	280	93.3
Other	20	6.7
Total	300	100.0

Table 4.14: Frequency and percentage of mother by giving breast feeding when their children was small

Breast Feeding's duration	Frequency	Percentage
Less than 6 months	28	10.0
6 months-12 months	81	27.0
12 months-24 months	189	63.0
Total	298	100.0

Table 4.15: Frequency and percentage of sanitary facility in their home

Sanitary facility	Frequency	Percentage
Toilet in house	222	74.0
Toilet outside	68	22.7
Public toilet/no toilet	10	3.3
Total	300	100.0

Table 4.16: Frequency and percentage of information's source

Information's source	Frequency	Percentage
Have a good information	118	39.5
Poor information	181	60.5
Total	299	100.0

Table 4.17 Frequency and percentage of income level

Income Level	Frequency	Percentage
Low	164	54.7
High	136	45.3
Total	300	100.0

Table 4.17 above reported that Based on household possession's question we made income level into 2 category, low income (54.7%) and high income (45.3%).

Table 4.18: Frequency and percentage of food mother's practice

Practice	Frequency	Percentage
Good	112	37.3
Poor	188	62.7
Total	300	100.0

Table 4.19: Frequency and percentage of food mother's knowledge

Behavior	Frequency	Percentage
Good	140	46.7
Poor	160	53.3
Total	300	100

4.3 Nutritional Status (BMI [Body Mass Index]) of Children

Table 4.20: Nutritional status of children as classified by BMI

Classification	Frequency	Percentage
Normal	102	34.0
Underweight	198	66.0
Total	300	100.0

Weight (kg) and height (cm) of 300 children were measured. After that their BMI (Body mass Index) were calculated using weight/height^2 (kg/m^2). Using cut off point of CDC growth charts children were classified as normal and underweight. The results of study were that, the prevalence of underweight from public primary school children grades 1-3 in Jati Asih sub district Bekasi Indonesia was 66%.

Table 4.21: Distribution of height, weight, and BMI in of children

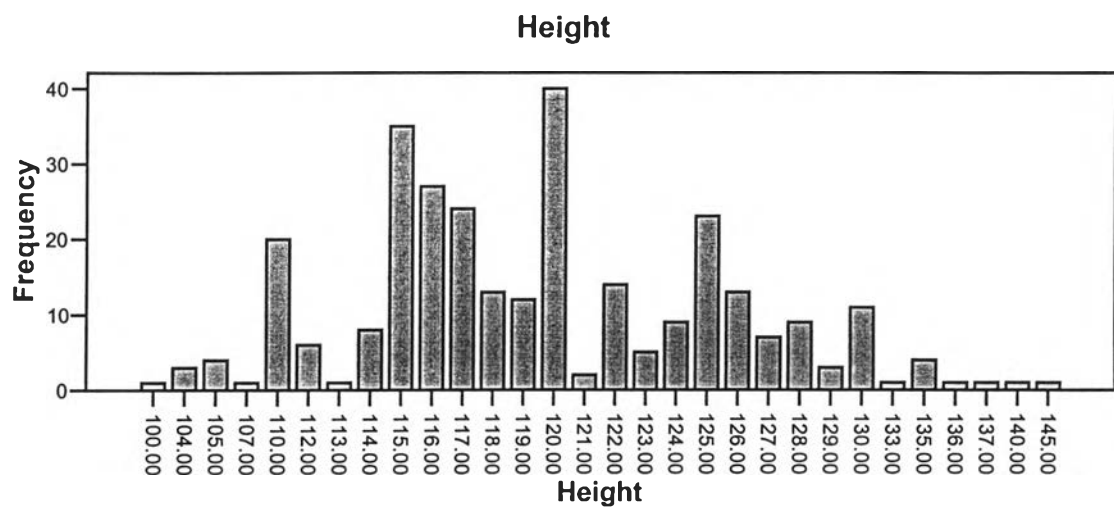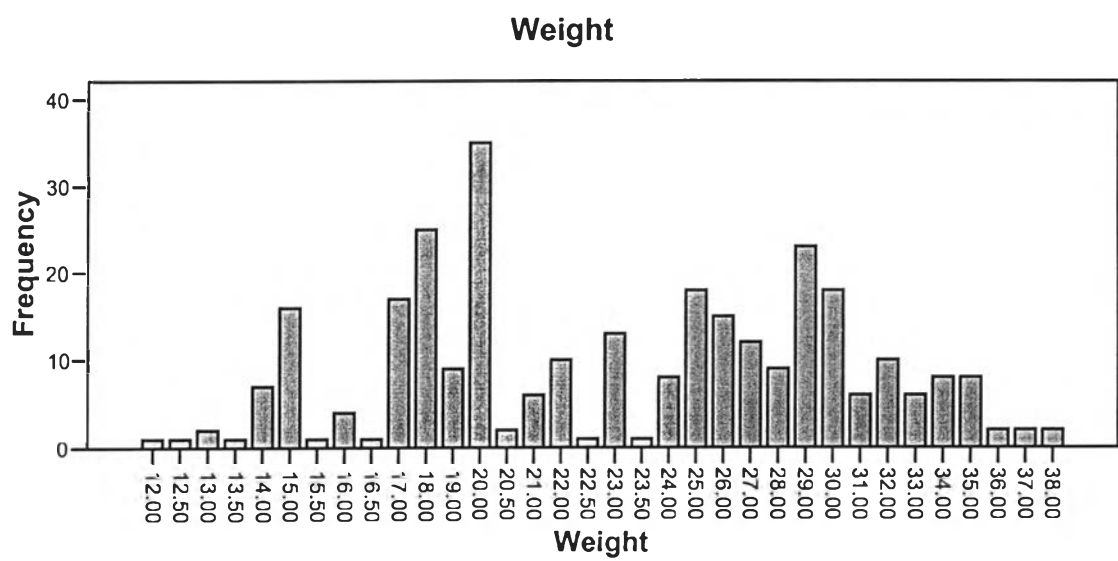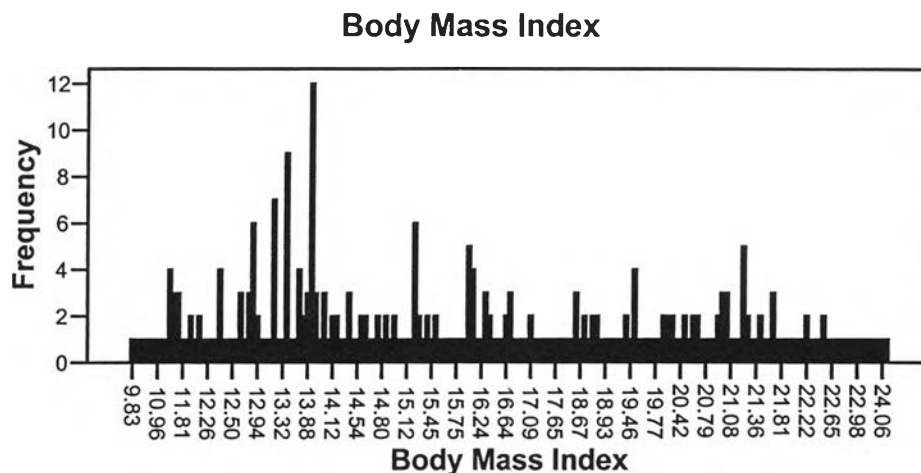| Items	Height (cm)	Weight (kg)	BMI
Mean	119.5	23.8	16.5
SD	6.51	6.18	3.63
Min	100	12	9.83
Max	145	38	24.8

Height

Figure 4.5: Distribution of children's height

Weight

Figure 4.6: Distribution of children's weight

Body Mass Index

Figure 4.7: Distribution of children's BMI

Table 4.21 and Figure 4.5 to Figure 4.7 above describes height, weight and BMI. The results of this study showed that in total 300 of subjects, the lowest height of children was 1.00 meter and highest was 1.45 meter. The mean of height was 1.19 meter. The smallest weight was 12 kilograms and the highest as 38 kilograms. The mean of weight was 2.37 kilograms. The lowest BMI was 9.83 and the highest was 24.79.

4.4 Association Between School Snack Program and Nutritional Status

Table 4.22 above describe association between nutritional status of children and school snack program. There was statistically significant difference between nutritional status of children and school snack program with p value 0.003. Percentage of children who had school snack program tended better nutritional status.

Table 4.22: Nutritional status of children by school snack program

		School Snack program (SSP)		Total	Chi Square	p-value
		With	Without			
	Normal	63	39	102		
Nutritional		42%	26%	34.0%		
Status	Underweight	87	111	198	8.56*	0.003
		58.0%	74%	66.0%		
Count and % with		150	150	300		
School snack program		100%	100%	100%		

* 0 cells (.0%) have expected count less than 5

4.4.2 Association between nutritional status of children and their body mass index.

By using t-test for seeing the association between nutritional status of children and their body mass index, there was statistical significance between nutritional status of children and their body mass index (P-value < 0.001). Percentage of children who had school snack program tended better nutritional status.

Table 4.23: Association between nutritional status of children and their body mass index

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	12.115	.001	32.295	298	.000	6.73	.21	6.32	7.14
Equal variances not assumed			35.543	262.726	.000	6.73	.19	6.36	7.10

4.4.3 Association between nutritional status of children and possible determinants other than the school snack program.

Table 4.24: Association between nutritional status of children and education of their mothers

Nutritional Status	Level of mother's education			Total	Chi square	p-value
	High	Middle	low			
Normal	73	27	2	102	180.110*	<0.001
	96.1%	18.2%	2.6%	34.0%		
Under	3	121	74	198		
Weight	3.9%	81.8%	97.4%	66.0%		
Total	76	148	76	300		
	100%	100%	100%	100%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.84.

Table 4.25: **Association between nutritional status of children and education of their father**

Nutritional Status	Level of father's education			Total	Chi square	p-value
	High	**Middle**	**low**			
Normal	84	18	0	101	145.047*	<0.001
	77.8%	18.2%		34.1%		
Under	24	139	34	198		
Weight	22.2%	81.8%	100%	66.2%		
Total	108	157	34	299		
	100%	100%	100%	100%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.60.

Table 4.24 and Table 4.25 above describe association between nutritional status of children and their parent's education. There was statistically significant difference between nutritional status of children and their mother's education with p value 0.00, also there was statistically significant difference between nutritional status of children and their father's education with p value 0.01. Percentage of children who were their parents had high education tended better nutritional status.

Table 4.26: Association between nutritional status of children and their mother's occupation

Nutritional	Mother's occupation			Chi Square	p-value
Status	House wife	Working	Total		
Normal	89	13	102	0.111*	0.739
	34.4%	31.7%	34%		
Under	170	28	198		
Weight	65.6%	68.3%	66.0%		
Total	259	41	300		
	100%	100%	100.0%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.94.

Table 4.27: Association between nutritional status of children and their father's occupation

Nutritional	Father's occupation			Total	Chi square	p-value
Status	High	Middle	low			
Normal	42	57	3	102	14.967*	0.001
	51.2%	28.1%	21.4%	34.1%		
Under	40	146	11	197		
Weight	48.8%	71.9%	78.6%	65.9%		
Total	82	203	14	299		
	100%	100%	100%	100%		

* 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.78.

Table 4.26. and Table 4.27 above describe association between nutritional status of children and their parent's occupation. There was statistically significant difference between nutritional status of children and their father's occupation with p value 0.01, but there was not statistically significant difference between nutritional status of children and their mother's occupation with p value 0.739. Percentage of children who were their father's had a good occupation tended better nutritional status.

Table 4.28: Association between nutritional status of children and their gender

Nutritional	Gender			Chi Square	p-value
Status	Male	Female	Total		
Normal	6	96	102	230.113*	<0.001
	3.1%	89.7%	34.0%		
Under	187	11	198		
Weight	96.9%	10.3%	66.0%		
Total	193	107	300		
	100.0%	100.0%	100.0		

*0 cells (.0%) have expected count less than 5. The minimum expected count is 36.38.

Table 4.28 shows association between nutritional status of children and their gender. Male has high prevalence of underweight than female and there was statistically significant difference between nutritional status of children and their gender with p- value<0.001.

Table 4.29: Association between nutritional status of children and their religion

Nutritional	Religion			Chi Square	p-value
Status	Muslim	Other	Total		
Normal	95	7	102	0.584*	0.747
	33.9%	35.0%	34.0%		
Under	185	13	198		
Weight	66.1%	65.0%	66.0%		
Total	280	20	300		
	100.0%	100.0%	100.0%		

* 2 cells (33.3%) have expected count less than 5. The minimum expected count is .34.

Table 4.29 above describe association between nutritional status of children and their family's religion. There was not statistically significant difference between nutritional status of children and their family's religion with p value 0.747.

Table 4.30: Association between nutritional status of children and duration of breast feeding when they were small

Nutritional Status	Duration of breastfeeding			Total	Chi Square	p-value
	<6months	6-12 months	12-24 months			
Normal	13	24	62	101	2*	0.336
	46.4%	32.1%	32.8%	33.9%		
Under	15	55	127	197		
Weight	53.6%	67.9%	67.2%	66.1%		
Total	28	81	189	298		
	100.0%	100.0%	100.0%	100.0%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.49.

Table 4.30 above describe association between nutritional status of children and duration of breast feeding when they were small. There was not statistically significant with p- value 0.336.

Table 4.31: Association between nutritional status of children and their sanitary facility in home.

Nutritional Status	Sanitary facility			Total	Chi Square	p-value
	Good	Middle	Poor			
Normal	77	20	5	102	1.825*	0.401
	34.7%	29.4%	50%	34%		
Under	145	48	5	198		
Weight	65.3%	70.6%	50%	66.1%		
Total	222	68	10	300		
	100%	100%	100%	100%		

* 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.40.

Table 4.31 above describe association between nutritional status of children and their sanitary facility in home. There was not statistically significant difference between nutritional status of children and their sanitary facility in home with p- value 0.401.

Table 4.32: Test of association between nutritional status of children and source of information about health and nutrition of their parents

Nutritional Status	Source of information			Chi Square	p-value
	Good	Poor	Total		
Normal	46	55	101	2.360*	0.125
	39.0%	30.4%	33.8%		
Under	72	126	198		
Weight	61.0%	69.6%	66.2%		
Total	118	181	299		
	100.0%	100.0%	100.0%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 39.86.

Table 4.32 above describe association between nutritional status of children and source of information about health and nutrition of their parents. There was not statistically significant difference between nutritional status of children and source of information about health and nutrition of their parents with p- value 0.125.

Table 4.33: Test of association between nutritional status of children and their mother's food practice

Nutritional Status	Mother's food practice			Chi Square	p-value
	Good	Poor	Total		
Normal	45	57	102	3.040*	0.081
	40.2%	30.3%	34.0%		
Under	67	131	198		
Weight	58.8%	69.7%	66.0%		
Total	112	188	300		
	100.0%	100.0%	100.0 %		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 38.08.

Table 4.33 above describe association between nutritional status of children and their mother's food behavior. There was marginally statistically significant difference between nutritional status of children and their mother's food behavior with p value 0.081.

Table 4.34: Test of association between nutritional status of children and their mother's food knowledge

Nutritional Status	Mother's food knowledge			Chi square	p-value
	Good	Poor	Total		
Normal	64	38	102	15.381*	< 0.001
	45.4%	23.9%	34.0%		
Under Weight	77	121	198		
	54.6%	76.1%	66.0%		
Total	141	159	300		
	100.0%	100.0%	100.0%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 47.94.

Table 4.34 above describe association between nutritional status of children and their mother's food knowledge. There was statistically significant difference between nutritional status of children and their mother's food knowledge with p value 0.00. Percentage of children whose their mother's food knowledge were good tended better nutritional status.

Table 4.35: Test of association between nutritional status of children and status of having breakfast

Nutritional Status	Status of Having breakfast			Chi square	p-value
	Yes	No	Total		
Normal	94	8	102	44.236*	< 0.001
	46.8%	8.1%	34.0%		
Under Weight	107	91	198		
	53.2%	91.9%	66.0%		
Total	201	99	300		
	100.0%	100.0%	100.0%		

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 33.66.

Table 4.35 above describe association between nutritional status of children and status of having breakfast. There was statistically significant difference between nutritional status of children and status of having breakfast with p value 0.00. Percentage of children had having breakfast were good tended better nutritional status.

Table 4.36: Test of association between nutritional status of children and their physical exercise

Nutritional Status	Physical exercise Of children			Chi Square	p-value
	Yes	No	Total		
Normal	102	0	102	1.037*	0.308
	34.2%	0.0%	34.0%		
Under	196	2	198		
Weight	65.8%	100.0%	66.0%		
Total	298	2	300		
	100.0%	100.0%	100.0%		

* 2 cells (50.0%) have expected count less than 5. The minimum expected count is .68.

Table 4.36 above describe association between nutritional status of children and their physical exercise. There was not statistically significant difference between nutritional status of children and their physical exercise with p value 0.308.