CHAPTER IV

RESEARCH RESULTS

A cross sectional, analytic study was conducted to ascertain prevalence and to identify determinants of overweight, obesity and related factors among children of 9 -10 years age in primary school children in Thai Nguyen city in Viet Nam, in January – February 2004.

Four hundred and sixty children and their mothers were selected as subjects for this study. Among them there were 2 children living with their fathers because their mothers were divorced and 2 children's fathers had died. There were 9 children living only with their mothers because their parents were divorced. Therefore, in my study 2 mothers and 11 fathers were missing.

Descriptive statistics were used to tabulate general characteristics of children and their mothers' knowledge, attitude and practice. Chi-square statistic and correlation coefficients were calculated to test bivariate associations among independent and dependent variables. Multiple logistic regressions analysis was used to assess simultaneous relative importance of independent variables in relation to children's overweight and obesity. Results of this study are presented in five parts.

(1). General characteristics of children

(2). Socio-demographic characteristics of parents

(3). Nutritional status of children

(4). Physical activities, knowledge and attitude of children and their mothers.

(5). Associations between overweight and obesity of children and possible determinants.

4.1. General characteristic of children

Four hundred and sixty children who were enrolled from six primary schools in Thai Nguyen city in Vietnam were included in the study. General characteristics of children are presented in table 4.1 to 4.2 and figure 4.1 below.

Table 4.1: Frequency and Percentages of Children by Age and Gender

N= 460

Age	9 years old		10 years old	
	n	%	n	%
Male	138	55.8	122	57.3
Female	109	44.2	91	42.7
Total	**247**	**100**	**213**	**100**

Figure 4.1: Percentage of Children by Age and Gender

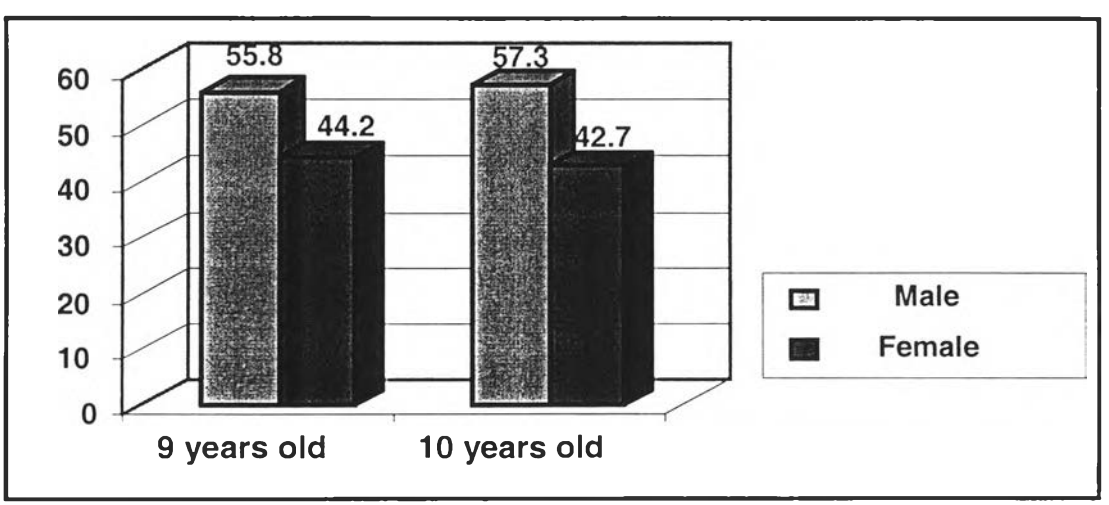

Table 4.1 above shows that 247 children were 9 years old and 213 children were 10 years old. The frequencies of boys were higher than girls in both age groups of 9 and 10 years old at 53.0% and 54.5% respectively.

Table 4.2: Frequency and Percentage of Children by Position in the Family

Position in the family	Frequency	Percentage
First child	275	59.8
Middle child	22	4.8
Youngest child	163	35.4
Total	460	100.0

Table 4.2 above shows that percentage of first child was highest at 59.8% and lowest was middle child at 4.8%, because the prevalence of families who had more than 2 children was low 8.4% (more detail in table 4.4).

4.2. Socio-demographic characteristics of children's family

Four hundred and sixty children and their parents were included in this study. Parents of children were described by age, number of children in family, number of people in the family, type of family, education, monthly income, occupation, and weight and height. Characteristics of parents are presented in tables 4.3 to 4.8.

Table 4.3: Frequency and Percentage of Mothers and Fathers by Age

	Frequency		*Percentage*
Age of mothers			
20-29	9		2.0
30-39	290		63.3
40-49	153		33.4
50-59	6		1.3
Valid	458		100
Missing	2		
Total	**460**		
Mean = 37.34	SD= 5.17	Min=28	Max =54
Age of fathers			
30-39	138		30.7
40-49	270		60.2
50-59	37		8.2
60-69	4		.9
Valid	449		100
Missing	11		
Total	460		
Mean = 41.97	SD = 5.362	Min= 30	Max= 64

Figure4.3: The Age Distribution of Fathers and Mothers

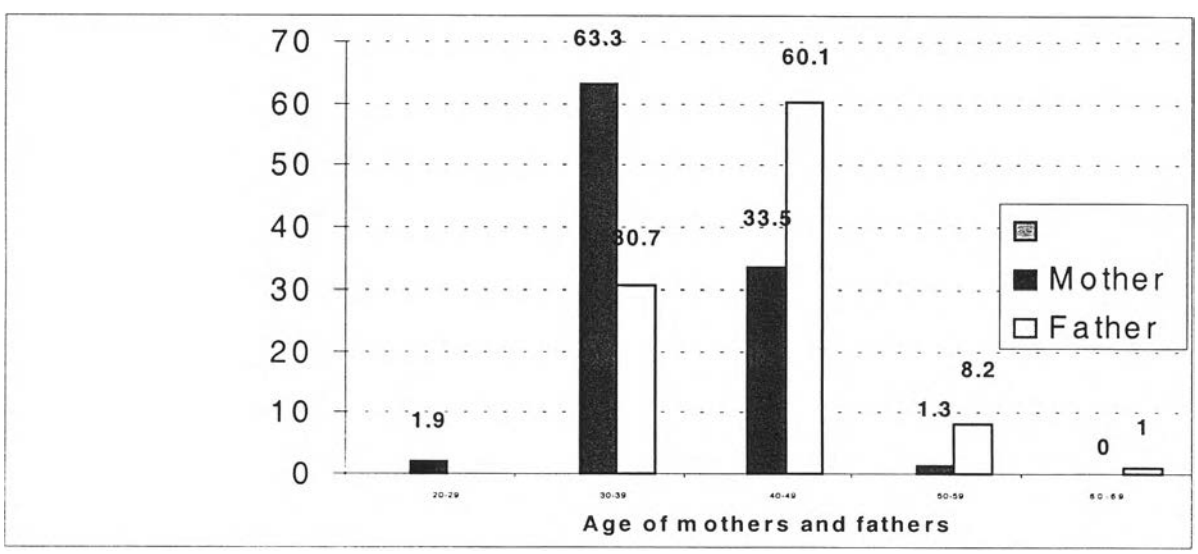

Table 4.3 above shows that age of mothers ranged from 28 to 54 years with mean age of 37.3 years and standard deviation of 5.2 years. The age distribution of mothers showed that majority (63%) was concentrated in age group of 30-40 years. In age group, more than 50 years accounted for only 1.3%. The mean of age indicated that almost of mothers in this study were still young.

The age of fathers ranged from 30 to 64 years with mean age of 42 years and standard deviation of 5.4 years. The age distribution of fathers showed that majority (58.7%) was concentrated in the age group from 40-50 years. The age group over 50 accounted for only 8.9%. The mean of father's age was higher than mothers' by 4 years.

Table 4.4: Frequency and Percentage of Number of Children & People in Family and Type of Family

		Frequency	Percentage
Number of children in family			
1		109	23.7
2		312	67.8
3		27	5.9
4		7	1.5
> 4		5	1.0
Mean =1.9	Median=2	Min =1	Max =8
Number of people in family		***n***	*%*
2-3		107	23.3

4-5	329	71.5
> 5	24	5.2
Total	460	100.0
Type of family (n=458)		
Extended	102	22.3
Nuclear	356	77.7
Total	458	100

Figure 4.4: Distribution Number of Children in Family

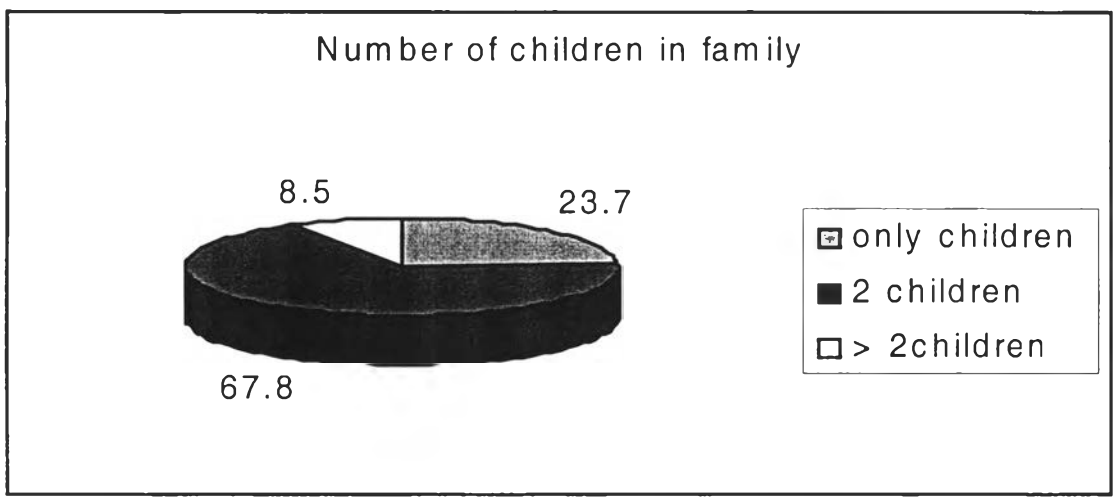

Table 4.4 and figure 4.4 above describes in detail about number of children in the family. The distribution of number of children in families ranged from 1 to 8. Almost all families had

1-2 children. Families with 1 child were 109 (23.7%). The percentage of families who had 2 children was highest (67.8%) and families with more than 4 children were lowest (1%).

In term of number people in the family, percentages of families who had 4-5 people were highest (71.5%). Twenty three percent of families had only 2-3 people in the family. Only 5.2 percent of families had more than 5 people in the family. Most of families were nuclear families (77.4%).

Table 4.5: Frequency and Parentage of Monthly Family Income

Monthly income (VND)*	Frequency	Percentage
< 150 000 dong/person/month	75	16.3
150 000-500 000 dong/person/month	203	44.1
>500 000 dong/person/ month	182	39.6
Total	460	100.0

* 1 USD ≈ 15,000VND

Table 4.5 above shows that nearly half of the respondents (44.1%) reported their monthly income between 150,000 -500,000 VND while another 39.3 % reported their monthly income above 500,000 VND. Only 16.3 % of the respondents' monthly income level was less than 150,000VND.

Table 4.6: Frequency and Percentage of Education and Occupation of Mothers

N=458

Education of mothers	Frequency	Percent
Not finished secondary school (< grade 9)	22	4.8
Finished secondary school (finished grade9)	82	17.9
Finished high school (finished grade 12)	166	36.3
Above high school (Bachelor, Master ..)	188	41.0
Occupation		
Government staff	172	37.4
Business	78	17.0
Workers	77	16.7
Housewife/Unemployed	93	20.2
Farmers	21	4.6
Retired	2	.4
Others	15	3.3

In terms of education level, not finished school means that they did not finish grade 9. Finished secondary school means that they finished grade 9 but not finished grade 12. Finished high school means they finished grade 12. Only 4.8% of respondents had less than secondary level of education whereas more than one fourth of them had finished secondary school. More than one third of them (36.1%) finished high school, and most of them had college level of education (40.9%). This study conducted in a city therefore, most of mothers have high level of education.

Regarding occupation, the largest proportion of mothers, 37.4 %, were working as government staff. About 16.7% were working as factory workers and 20.2% as housewives. Farmer and other occupations accounted for only 4.6 % and 3.3 %, respectively.

Table 4.7: Test of Association between Education of Mothers with Their Occupation and Income

	Education of mothers							
	Not finished high school		Finished high school		Bachelor and over		Chi-square	df	p- value
	n	%	n	%	n	%			
Income									
<150,000 VND	42	40	24.9	14.6	9	4.8	72.0		0.000
150,000-300,000VND	44	41.9	76	46.3	81	42.9			
> 500,000 ND	19	18.1	64	39.0	99	52.4			
Occupation									
Government staff	8	7.6	28	17.1	135	71.4	209.9		0.000
Business	23	21.9	45	27.4	11	5.8			
Worker	11	10.5	46	28	20	10.6			
Housewife	38	36.2	35	21.3	20	10.6			
Others	25	23.8	10	6.1	3	1.6			

There was statistically significant association between education level of mothers and their occupations and income, Most of mothers who had higher level of education they had high income level, and worked as government staff. Most of mothers who worked as farmers, worker and housewife had low or medium level of education.

Table 4.8: Classification of Nutritional Status of Mothers and Fathers by BMI

Classification (BMI)	Frequency	Percentage
Mothers (n= 458)		
Underweight (< 18.5)	45	9.8
Normal (18.5- 24.9)	388	83.5
Overweight (≥ 25)	19	6.3
Mean= 21.2 SD=2.3	Min =14	Max = 31
Fathers (n=448)		
Underweight < 18.5	18	4.0
Normal (18.5 – 24.9)	387	86.4
Overweight & obese ≥ 25	43	9.6
Mean=22.3 SD= 2.1	Min =17	Max = 28

Table 4.8 above shows that 6.3% of mothers were considered overweight (with a BMI > 25). Almost all mothers had BMI between18.5 to 24.9 (75.9%). There were 43 fathers who had BMI higher than 25 (9.6%). Almost all fathers had BMI between 18.5- 24.9 (86.4%).

4.3. Nutritional status of children

Table 4.9: Nutritional Status of Children as Classified by BMI in percentile

Classification	Frequency	Percentage
Overweight & obese	53	11.5
Normal	336	73.0
Underweight	71	15.4
Total	**460**	**100**

Weight (kg) and height (cm) of 460 children were measured. After that their body mass indexes were calculated using weight/height^2 (kg/m^2). Using cut off point of CDC growth charts children were classified as underweight, normal and overweight. The results of study were that, the prevalence of overweight was 7.8 % and obesity was 3.7 % in primary school children at age 9-10 years in Thaingyen city.

Table 4.10: The Distribution of Height, Weight, BMI, waist circumference, Hip circumference, and Waist / hip ratio in Children

	Height (m)	Weight (kg)	BMI (w/ h^2)	Waist circumference (cm)	Hip circumference (cm)	Waist/hip ratio
Mean	1.33	28.56	16.15	54.58	67.13	.81
Std.	.061	5.84	2.40	6.96	5.81	.056
Minimum	1.15	19.0	12.43	43.0	53.5	.67
Maximum	1.50	53.0	25.56	81.5	91.1	.96

Figure 4.9: Distribution of Weight Children

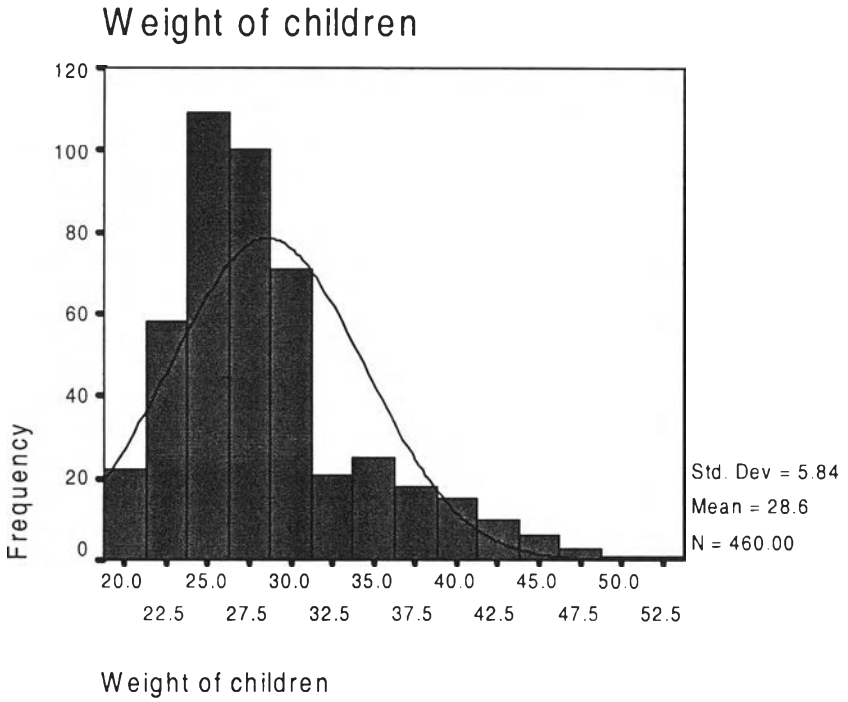

Figure 4.10: Distribution of BMI Children

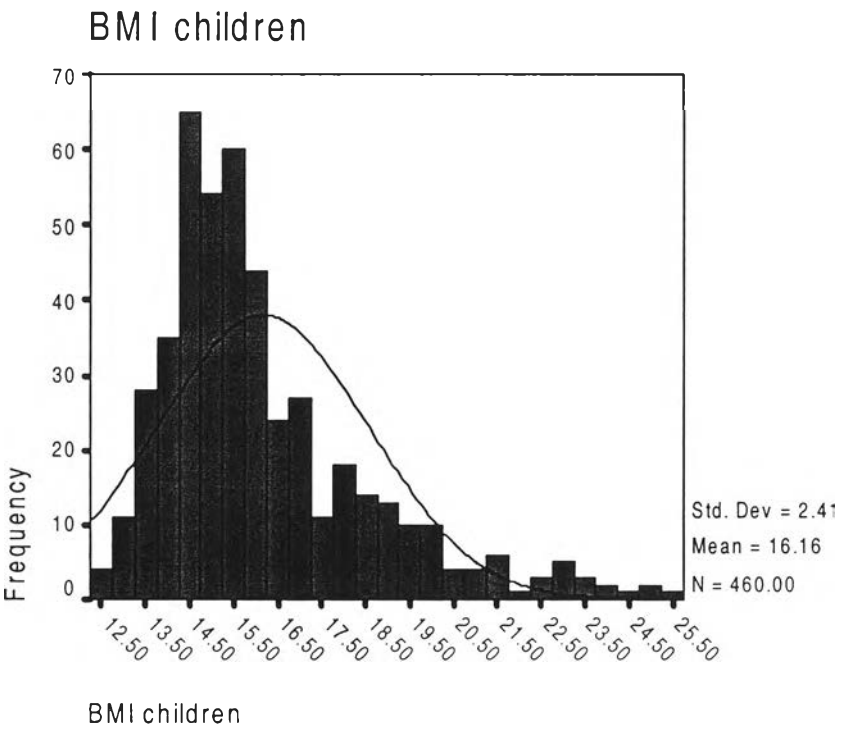

Table 4.10 above describes height, weight, waist circumference, hip circumference and waist /hip ratio. The results of this study showed that in a total 460 of subjects, the lowest height of child was 1.15 meter and highest was 1.50 meter. The mean of height was 1.33 meter. The smallest weight was 19 kilograms and the highest as 54 kilograms. The mean of weight was 28.56 kilograms. The lowest waist circumference was 43 centimeters and 85.1 centimeters was the highest. The mean of waist circumference was 54.59 centimeters. The lowest hip circumferences of children were 53.5 centimeters and 91.1 centimeters, the highest. The mean of hip circumference was 67.13 centimeters.

4.4. Physical activities, knowledge and attitude of children

4.4.1 Physical activities of children

Table 4.11: Frequency and Percentage Vigorous and Moderate Physical Activities among Children

	Vigorous physical activities		Moderate physical activities		Walk or bicycle to school	
Days per week	n	%	n	%		
0	153	33.3	42	9	264	57.4
1	13	2.8	7	1	0	0
2	92	20.0	95	20	6	1.3
3	86	18.7	99	21	15	3.3
4	24	5.2	34	7	4	.9
5	36	7.8	105	22	171	37.2
6	11	2.4	16	3		
7	43	9.3	62	13		
Total	458	99.6	460	100.	460	10

Figure 4.11 Physical Activities of Children

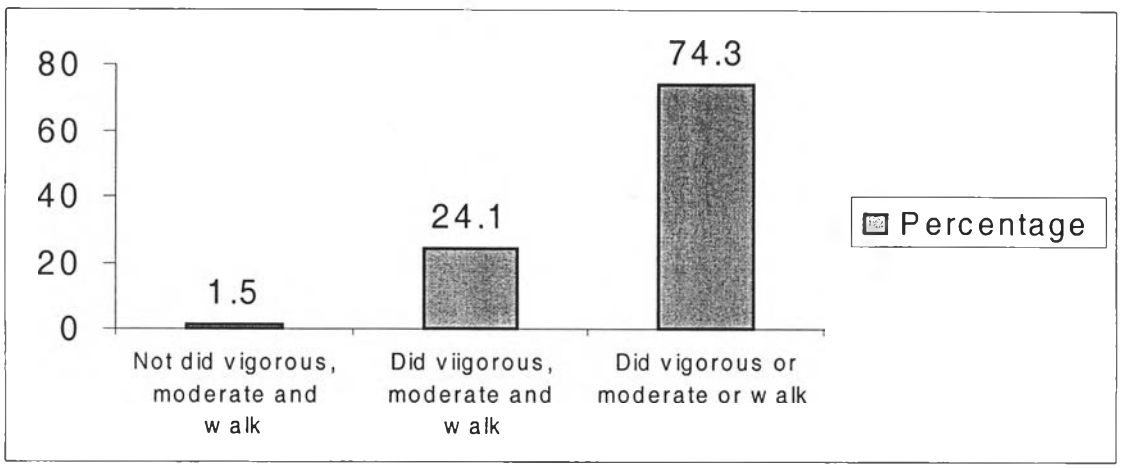

Table 4.11 above shows that majority of children (67%) enrolled for vigorous physical activities and over one third (38.7%) did vigorous physical activities for 2or 3 days per week. There were 153 children who did not participate in vigorous physical activities.

The large majority of children (91.1%) enrolled for moderate physical activities and nearly half of them (38.7%) did moderate physical activities for 2 or 3 days per week. Among 460 children, there were 42 children who did not participate in moderate physical activities.

Among 460 children, there were 264 children who were taken to schools by their parents. Nearly half of them (42.6%) walked to school or rode bicycles. One third of them (37.3 %) walked to school or used bicycle every day.

The Figure 4.11 shows that there were 7 children (1.5%) who did not engage in any physical activity. Three of them were normal and four of them were overweight. Most of them think that physical activities are not necessary. Two of them live in family with moderate income, and 5children live in family with high income level.

4.4.2. Knowledge of children on nutrition and physical activities

In appendix G, the number and percentage of the answers to each question for knowledge of children are shown. It found that almost all children (91.3%) knew fruits were better than ice cream. Seventy percent of them knew vegetable oil was better than animal fat. Ninety two percent of them thought that physical activities were good for health but some of them did not know how long they should do physical activities.

4.4.3. Attitude of children

In appendix G, regarding physical image, one third of them did not like their body appearance. In this question in order to know whether they answered consistently or not, I compared between their answers with the classification of nutritional status by BMI percentile. For example a child give answer that he /she is thin in physical appearance but on calculating BMI we find his BMI less than 5 percentile then answer is correct, and if BMI higher than 5 percentile then the answer is incorrect. By this method more than haft of overweight children thought they were normal. Some children thought they were normal but infact they were underweight.

Regarding physical activities, most children liked be involved in physical activities (97.2%). Ninety four percent of them thought physical activities were necessary and 89.6% of them did not like to spend all their time for study.

Table 4.12: Frequency and Percentage of Children by Level of Knowledge and Attitude

Knowledge	Number	Percentage
Good (≥ 6 correct answers)	306	66.5
Poor (1-5 correct answers)	154	33.5
Attitude	n	%
Good (≥ 5 correct answers)	342	74.34
Poor (1-4 correct answers)	118	25.65

The result shows that 66.5% of children had good knowledge as they could answer correctly more than 5 questions. The remaining 33.5 percent were categorized as having poor knowledge.

In terms of attitude level, about two third of children had good attitude and could answer correctly more than four questions. There were 25.65 percent of them who could be categorized as having poor attitude.

Table 4.13: Association between Knowledge and Attitude of Children

	Knowledge of children				Chi-square	P value
	Poor knowledge		Good knowledge			
	n	%	n	%		
Poor attitude	48	34.3	50	20.1	9.59	.002
Good attitude	92	65.7	199	79.9		
Total	140	100	249	100		

There was statistically significant difference between knowledge and attitude of children with p-value 0.002. Percentage of children who had good knowledge tended to have better attitude.

4.5. Frequency and percentage of mothers by level of practice, knowledge and attitude

4.5.1. Knowledge of Mothers on balanced diet and physical activities

Appendix G shows that there were 309 respondents who knew vegetable oil was better than animal fat (67.2%) but only 289 respondents used vegetable oil (62.82%). More than a half of respondents knew that fish was better than pork. But only one third of them used fish in most of their meals. There were 296 (64.3%) respondents who knew four major compositions of diet. More than 90% of respondents thought that physical activities were good for health and they encouraged their child to participate in physical activities.

4.5.2. Attitude of Mothers

In appendix G, the number and percentage of mother's attitude are shown. 145 respondents thought that child's physical appearance (31.5%) was incorrect. Mothers were asked about the physical appearance of their child which was compare with BMI of these children. If mother answer is thin, and BMI of their children is lower 5 percentile then the answer is correct and if BMI is above 5 percentile then the answer is incorrect. Most of mothers preferred boys or girl equally. Thirteen percent of respondents wanted their children to eat as much as possible. Ninety three percent of them thought that overeating of sweet food was not good for health.

Regarding physical activities, Ninety eight percent of respondents thought that physical activities were necessary for children. There were 19.6% of respondents who wanted their child to spend all their time studying. However, almost all of mothers considered that physical activities were necessary for children.

4.5.3. Practice of Mothers

In appendix G, regarding use of animal fat or vegetable oil, 62.8% families used vegetable oil to cook foods. More than one third used animal fat to cook. Some families did not include vegetables in their daily meals. One fourth of mothers had snacks of chips and biscuits. There were one third of mothers who had the habit of using food as a reward for their children (36.7%). Almost all mothers encouraged their children to do physical activities (94.3%).

Table 4.14: Frequency and Percentage of Mothers by Level of Practice, Attitude and Practice

Level of knowledge ***(total scores 11)***	Number	Percentage
Good (getting ≥ 7scores)	271	58.9
Poor (getting <8 scores)	189	41.1
Level of attitude *(total scores of attitude were10)*	n	%
Good (getting ≥ 8 scores)	200	43.5
Poor (getting < 8 scores)	260	56.7
Level of practice *(Total score of practice 11)*	n	%
Good (getting ≥ 8 scores)	231	50.2
Poor (getting < 8 scores)	229	49.8

In terms of level of knowledge, there were 271 mothers who had good knowledge, they got score equal or higher than 7.

Two hundred respondents had good attitude level. They got score equal or higher than 8 Two hundred and thirteen respondents had good practice level with score of equal or higher more than 8 (49.8%).

Table 4.15: Test of association between Knowledge, Attitude and Practice of Mothers

	Poor practice		Good practice		Chi-square	p- value
	n	%	n	%		
Knowledge (n=389)						
Poor knowledge	166	59.9	111	40.1	28.667	.000
Good knowledge	63	34.4	120	65.6		
Attitude (n=389)						
Poor attitude	143	55.0	117	45.0	6.511	.011
Good attitude	86	43.0	114	57.0		

There were significant relationships between practice of mothers and their knowledge with $p < .001$ and there were relationship between practice of mothers and their attitude with $p = 0.001$ respectively. Mothers had good knowledge and attitude they tend to have better practice.

4.6. Determination of overweight and obese children

Dependent variable was nutritional status of children (normal versus overweight and obese) or BMI of children. The factor, which may be related to overweight and obese children, includes the following:

- Socio demographic characteristics; gender, position in the family, number of children in the family, number of people in the family, education of mothers, type of family, monthly income, occupation of mothers

- Physical activities, knowledge and practice of children

- BMI of mothers and fathers

- Knowledge, attitude and practice of mothers on balanced diet and quality of diet.

The bivariate analysis was used to test the relationship between BMI of children and independent variables such as BMI of mother, and age of mother. Multiple logistic regression analysis was used to evaluate relative importance of variables that showed statistically significant or marginally significant associations with overweight and obesity of children ($p \leq .10$) in bivariate analyses. Since this study focused on overweight and obesity those children weights were classified as underweight were omitted in the analysis.

Table 4.16: Test of Association between Gender and Nutritional Status of Children

	Gender				Chi-square	df	p- value
	Male		Female				
	n	%	n	%			
Normal	186	84.2	150	89.3	2.21	1	.094
Overweight & obese	35	15.8	18	10.7			
Total	221	100	168	100			

Table 4.16 above shows the association between genders and overweight and obese children. The percentages of overweight and obese boys were higher than girls and there was a marginally statistical significance with p-value = .094.

Table 4.17: Test of Association between Position in the Family and Overweight and Obese Children

	Positions in the family						Pearson Chi-square	df	P-value
	First child*		Middle		Youngest				
Normal	199	84.7	15	88.2	122	89.1	1.475	2	.483
Overweight & obesity	36	15.3	2	11.8	15	10.9			
Total	235	100	17	100	137	100			

* Included 79 single children (only children)

The results showed that, the percentages of overweight and obesity among first child were higher than middle and youngest child. However, Chi-square test for association between nutritional status of children and their positions in the family was not statistically significant association (p= .483)

Table 4.18: Test of Association between Number of Children in the Family and Overweight and Obese Children

	Number of children in the family						Pearson Chi-square	df	P-value
	1 child		2 children		≥ 3 children				
Normal	79	81.4	225	86.5	32	100	7.052	2	.029
Overweight & obese	18	18.6	35	13.5	0	0			
Total	97	100	260	100	32	100			

To determine the relationship between overweight and obese children and number of children in the family, the Chi-square was used. The results showed that, there was statistically significant difference between nutritional status of children and number of children in the family (Chi-square 7.052 p =.029). Prevalence of overweight and obesity of single child was higher than with more children in the family.

Table 4.19: Test of Association between Number of People in the Family and Overweight and Obese Children

		Number people in the family			Pearson Chi-square	
		< 4 people	≥ 4 people	df		P-value
	n	74	262			
Normal	%	80.4	88.2			
Overweight and obese	n	18	35	1	3.61	.057
	%	19.6	11.8			
Total	n	92	297			
	%	100.0%	100.0%			

Families who had less than four members were higher prevalence of overweight and obese children than families had more than 4 members. There was a marginally statistically significant association between overweight and obese children and number of people in the family (p =.057).

Table 4.20: Test of Association between Age of Mothers and Overweight and Obese Children

N=387

	Age of mothers				Chi-square	df	P- value
	< 40 years old		≥ 40years old				
	n	%	n	%			
Normal	240	85.7	94	87.9	.299	1	.585
Overweight & obesity	40	14.3	13	12.1			
Total	280	100	107	100			

There was not a relationship between age of mothers and nutritional status of children (p=.57).

Table 4.21: Test of Association between Education of Mothers and Overweight and Obese Children

	Education of mothers								
	Not finished high school		Finished high school		Bachelor and over		Chi-square	df	p- value
	n	%	n	%	n	%			
Normal	68	87.2	121	82.3	145	76.7	3.437	2	.179
Overweight & obesity	10	12.8	26	17.7	17	9.0			
Total	78	100	147	100	189	100			

Table 4.21 shows that the level of education of mothers in group of overweight children and normal children were similar (p= .179)

Table 4.22: Test of Association between Occupation of Mothers and Overweight & Obese Children

		Occupation of mothers					Chi square	df	P-value
		Worker	Prof.	Business	House wife	(			
Normal	(n)	59	133	58	63	21			
	(%)	86.8	89.3	79.5	85.1	91.3	4.587	4	.332
Overweight & obese	(n)	9	16	15	11	2			
	(%)	13.2	10.7	20.5	14.9	8.7			
Total	(n)	61	149	73	74	23			
	(%)	100	100	100	100	100			

Table 4.22 above presents the association between occupations of mothers and nutritional status of children, which had 2 categories including normal, overweight and obesity. According to the results of the statistic test, there was no significant association between overweight group and their mother's occupations (p= 0 .332).

Table 4.23: Test of Association between Monthly Income and Overweight and Obese Children

	Monthly income						Chi-square	df	P value
	Low		Moderate		High				
	n	%	n	%	n	%			
Normal	56	96.6	151	91.0	129	78.2	17.846	2	<.001
Overweight & obese	2	3.4	15	9.0	36	21.8			
Total	58	100	166	100	165	100			

The results above show that level of income of families was strongly associated with overweight and obese children (Chi-square= 17.86, p< .001). Most of overweight & obese children lived in family with moderate and high income level. Frequency of group overweight and obese children was highest in families with high income level.

Table 4.24: Correlation between BMI of Mothers, Fathers and BMI of Children

		BMI of children
BMI of mother	Pearson correlation	.463
	P value	< .001
	Total	387
BMI of fathers	Pearson correlation	.263
	p-value	< .001
	Total	380

Figure 4.24: Correlation between BMI of Mothers and BMI of Children

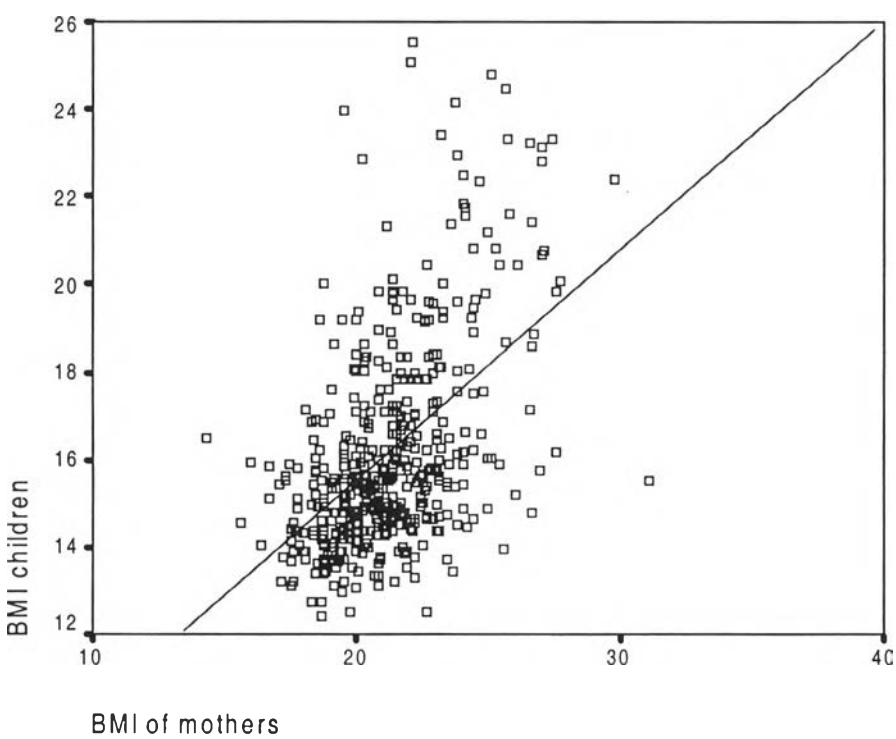

Figure 4.25: Correlation between BMI of Fathers and BMI of Children

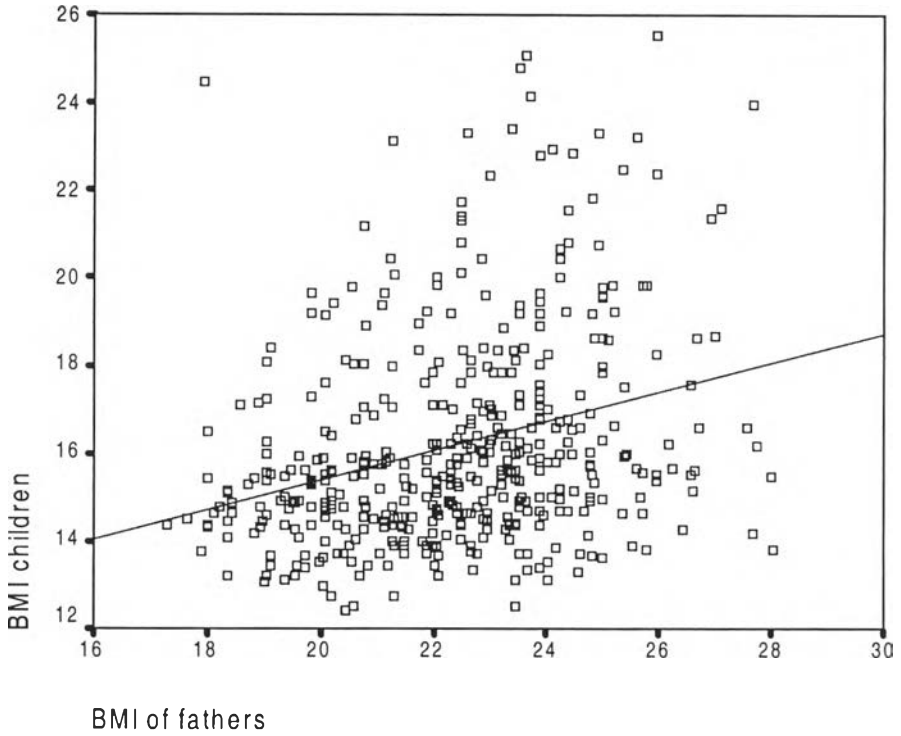

Table 2.24, Figure 2.24 and figure 2.25 present the correlation between BMI of mother and BMI of children. The results of bivariate correlation showed that there was positive trend of relationship between BMI of mother and their children (r=. 46, $p < .001$).

The results of correlate bivariate between BMI of fathers and BMI of children showed that there was positive trend of relationship between BMI of fathers and their children (r= .299, $p < .001$).

Table 4.25: Correlation between BMI of Children and Calculated Energy Expenditure based on Physical Activities

		MET
BMI of children	Pearson Correlation	-.166
	p- value	.001
	Total	385

MET energy expenditure estimates were based on the updated compendium of physical activities. MET levels were obtained in table 1 of Cara L. at al. (2003). The weighted MET-minutes per week (MET.min.wk^{-1}) were calculated as duration x frequency per week x MET intensity.

Table 4.25 presents the correlation between MET energy expenditure and BMI of children. The results of correlation bivariate showed that there was an inverses relationship between energy expenditure and BMI of children (Pearson correlation -.137 and p= .007).

Table 4.26: Test of Association between Overweight and Obese Children and Knowledge, Attitude and Practice of Mothers

	Normal		Overweight & obese		Chi-square	P value
	n	%	n	%		
Knowledge						
Good knowledge	199	86.5	31	13.5	.01	.919
Poor knowledge	137	96.2	22	13.8		
Attitude						
Good attitude	153	86.9	23	13.1	.085	.77
Poor attitude	183	85.9	30	14.1		
Practice						
Good practice	184	86.4	21	10.2	4.29	.04
Poor practice	152	82.5	32	17.4		

Table 4.26 shows that, there was no relationship between knowledge, attitude of mothers and nutritional status of children with p =.938, p=.77 respectively.

There was strong relationship between practice of mothers and nutritional status of children (p= .04). In normal group, the frequency of mothers with good practice was higher than other groups.

Table 4.27: Test of Association of Overweight and Obese Children with Their Knowledge and Attitude

	Normal		Overweight and obese		Chi-square	p-value
	n	%	n	%		
Knowledge (n=389)						
Poor knowledge	104	80.0	26	20.0	6.743	.009*
Good knowledge	232	89.6	27	10.4		
Attitude (n=389)						
Poor attitude	74	75.5	24	24.5	13.141	<.001*
Good attitude	262	90.0	29	10.0		

** Statistically significant difference*

Table 4.27 showed that, attitude and knowledge of children between normal group and overweight group were statistically significant association (p = < .005); in the normal groups, the percentage of good knowledge and attitude were higher than in the overweight groups.

In the bivariate analysis presented above, there were 9 independent variables that were found to have statistically significant differences or marginally significant associations with nutritional status of children. In order to evaluate relative importance of independent variables, multiple logistic regression analysis was used.

Table 4.28: Magnitude of the Effects of Independent Variables towards Overweight and Obese Children was Tested by Using Multiple Logistic Regression Analysis.

Variables	Coefficient	S.E.	Chi-square	p-value	Odds Ratio (exp(B))	95%C.I. for EXP (B)	
						Lower	Upper
Male	**-.681**	**.407**	**2.803**	**.094**	**1.96**	**.890**	**4.384**
Income	.266	.304	.762	.383	1.304	.718	2.368
Number of children in family	-.478	.357	1.789	.181	.620	.308	1.249
Knowledge of children	-.048	.159	.091	.763	.953	.698	1.301
Attitude of children	**-.617**	**.214**	**8.315**	**.004***	**.540**	**.355**	**.821**
Practice mothers	**-.386**	**.108**	**12.870**	**.000***	**.679**	**.550**	**.839**
Time of Vigorous physical activities	**-.616**	**.248**	**6.179**	**.013***	**.540**	**.332**	**.878**
BMI mothers	**.374**	**.083**	**20.424**	**.000***	**1.453**	**1.236**	**1.709**
BMI fathers	**.263**	**.099**	**7.011**	**.008**	**1.300**	**1.071**	**1.580**
Constant	-8.43	3.03	7.764	.005	.000		

** Statistically significant association at alpha= .05*

Multiple logistic regressions were used to evaluate relative importance among independent variables. The result shows that BMI of mothers, practice of mothers, BMI of fathers, attitude of mothers and time of vigorous physical activities were statistically significant association with nutritional status of children with p-value less than .05. There was marginally

statistically significant difference between genders and nutritional status of children with p-value .094. Therefore the important factors to nutritional status of children were BMI of parents and practice of mothers, physical activities, attitude of children and gender.