Results

Table (1): Obesity among the studied group.

Body weight / Study group	Normal weight		Overweight		Obese		Total	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Elshaimaa	188	80.3	35	15	11	4.7	234	100.0
Om Elmoaminin	180	72.3	60	24.1	9	3.6	249	100.0
Benha	90	74.3	25	20.7	6	5	121	100.0
Total	458	75.8	120	19.9	26	4.3	604	100.0

This table and chart (1) show that higher prevalence of obesity among students of Benha secondary school for females (5%) than that among students of Elshaimaa secondary school for females (4.7%) and students of Om Elmoaminin secondary school for females (3.6%).

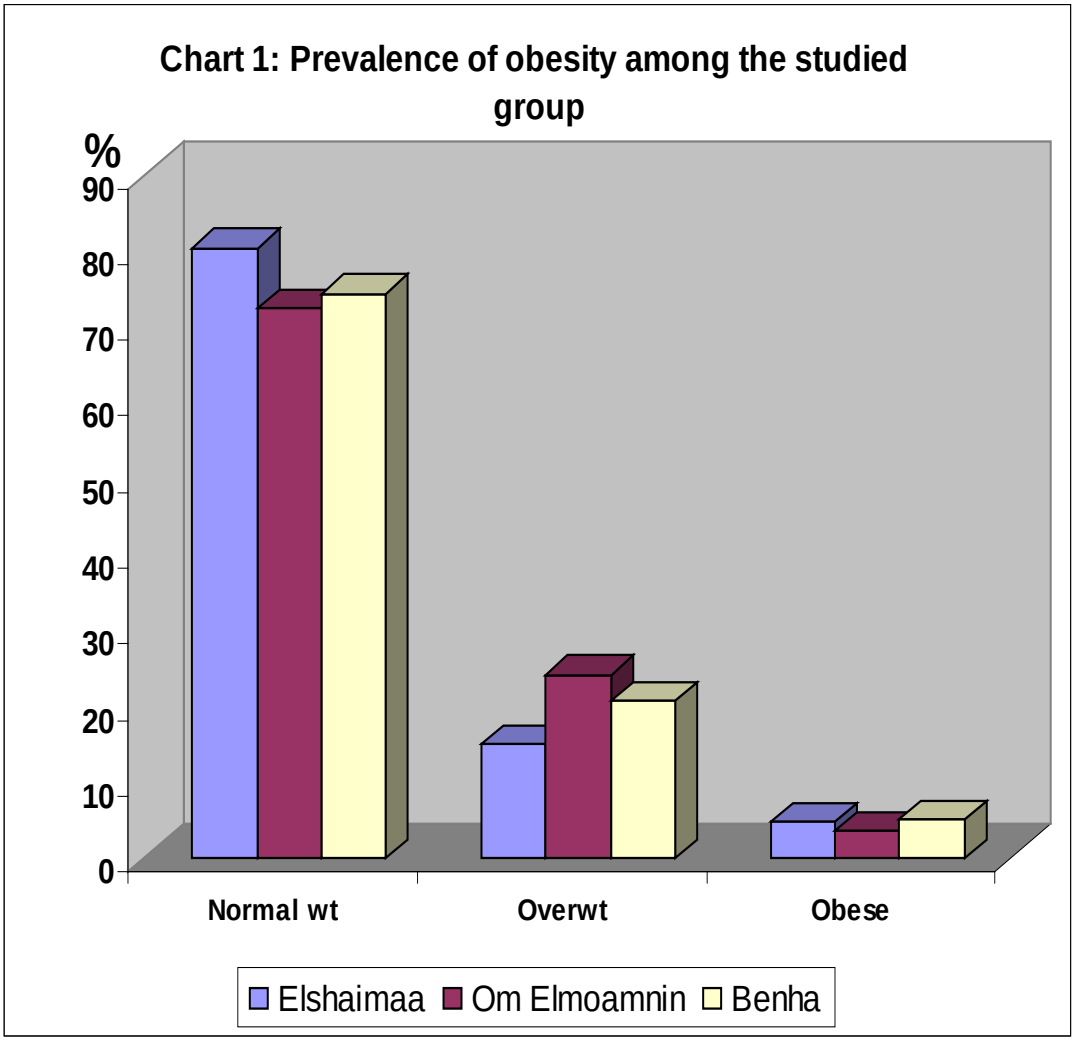
Chart 1: Prevalence of obesity among the studied group
%
90
80
70
60
50
40
30
20
10
0
Normal wt
Overwt
Obese
Elshaimaa
Om Elmoamnin
Benha

Table (2): Some socio-demographic characteristics among study group according to weight.

Body weight / Socio-demographic characteristics	Normal weight no.= 458		Overweight and Obese no.= 146		Total no= 604		Z	P
	No	%	No	%	No.	%		
Age							٠.٥٧	>0.0
15-	139	30.4	40	27.4	179	29.6	٠.٨١	>0.05
16-	220	48	78	53.4	298	49.4	٠.٥٦	>0.05
17+	99	21.6	28	19.2	127	21		
Residence								>0.05
-Urban	232	50.7	78	53.4	310	51.3	٠.٤١	>0.0
-Rural	226	49.3	68	46.6	294	48.7	٠.٤٢	
Social class							٠.٦٥	>0.05
-Low	126	27.5	45	30.8	171	28.3	٠.٧٦	>0.05
-Middle	217	47.4	62	42.5	279	46.2	٠.٣٣	>0.05
-High	115	25.1	39	26.7	154	25.5		

This table illustrates that the higher percentage of overweight and obesity were among the studied group aged 16 years (53.4%), urban students (55.4%) and students of middle social class (42.5%), with insignificant statistical difference.

Table (3): Distribution of the study group according to familial characteristics and weight.

Body weight / Familial characteristics	Normal weight no.= 458		Overweight and Obese no.= 146		Total no.= 604		Z	P
	No	%	No	%	No	%		
Father education								
-Illiterate	6	1.3	6	4.1	12	2.0	2.09	<0.05
-Basic and secondary	264	57.6	76	52.1	340	56.3	0.78	>0.05
-University	188	41.1	64	43.8	252	41.7	0.45	>0.05
Mother education-								
Illiterate	30	6.6	8	5.5	38	6.3	0.45	>0.05
- Basic and secondary	278	60.7	84	57.5	362	59.9	0.43	>0.05
-University	150	32.7	54	37	204	33.8	0.77	>0.05
Father occupation								
-Working	446	97.4	140	95.9	586	97.0	0.16	>0.05
-Not working	12	2.6	6	4.1	18	3.0	0.91	>0.05
Mother occupation								
-Working	246	53.7	70	47.9	316	52.3	0.84	>0.05
-Not working	212	46.3	76	52.1	288	47.7	0.88	>0.05
Father obesity								
-Present	117	25.5	109	74.7	226	37.4	8.45	<٠.٠٠١
-Absent	341	74.5	37	25.3	378	62.6	6.53	<٠.٠٠١
Mother obesity								
-Present	193	42.1	118	80.8	311	51.5	5.67	<٠.٠٠١
-Absent	265	57.9	28	19.2	293	48.5	5.84	<٠.٠٠١
Father and mother obesity								
-Present	123	26.9	81	55.5	204	33.8	5.18	<٠.٠٠١
-Absent	335	73.1	65	44.5	400	66.2	3.7	<٠.٠٠١

The table and chart (2) illustrate that there is insignificant statistical difference between the percentages of students of normal weight and students of overweight & obese regarding the basic& secondary and high level of education of their parents. On the other hand, there is significant statistical difference between the percentages of students of normal weight(1.3%) and students of overweight & obese (4.1%) whose their fathers are illiterate ($P<0.05$).

The table shows that most of overweight & obese students had working fathers and mothers (95.9% and 47.9% respectively) in corresponding to 97.4% and 53.7% of normal weight students and this difference is statistically insignificant ($P >0.05$).

The table and chart (3) show the relation between weight of students and their parents' obesity which is statistically significant ($P <0.001$). It is found that most of overweight & obese students (80.8%) had obese mothers in corresponding to 42.1% of normal weight students and more than half (55.5%) of overweight & obese students had obese fathers in corresponding to 26.9% of normal weight students.

Chart 2: Distribution of the study group according to their fathers education

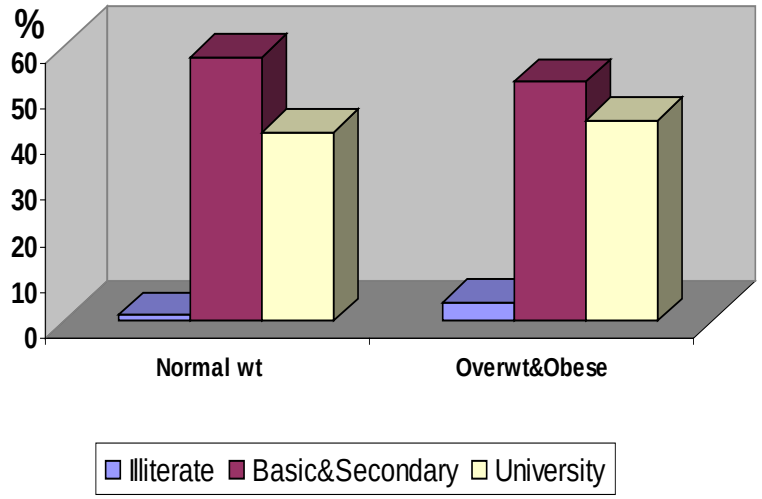

Chart 3: Distribution of the study group according to parents obesity

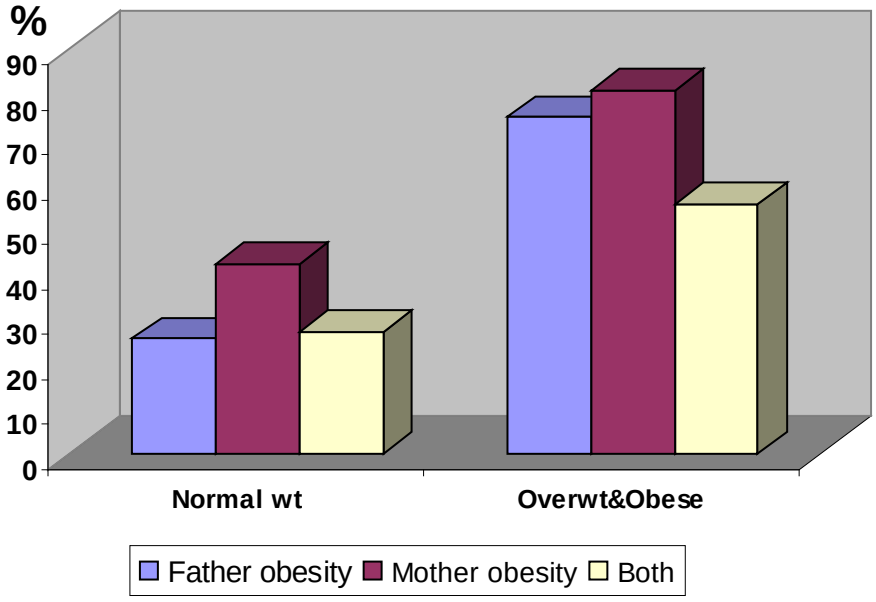

Table (4): Distribution of the study group according to dietary habits and weight.

Body weight / Dietary habits	Normal weight no.= 458		Overweight and Obese no.= 146		Total no.= 604		Z	P
	No	%	No	%	No	%		
Excess sweet intake								
-Present	244	53.3	100	68.5	344	56.9	2.12	<0.05
-Absent	214	46.7	46	31.5	260	43.1	2.44	<0.05
Sport drink consumption								
-Low	148	32.3	24	16.4	172	28.5	3.13	<0.01
-Moderate	260	56.8	94	64.4	354	58.6	1.05	>0.05
-High	50	10.9	28	19.2	78	12.9	2.42	<0.05
Score of dietary habits								
- Excellent	118	25.8	28	19.2	146	24.4	1.41	>0.05
- Good	194	42.4	46	31.5	240	39.7	1.81	<0.05
- Average	118	25.7	62	42.5	180	29.8	3.22	<0.05
- Below average	28	6.1	10	6.8	38	6.3	0.31	>0.05

This table and charts (4, 5) illustrate that some dietary habits among the studied group. There is statistically significant difference between the percentage of overweight & obese and normal weight students regarding excess sweet intake where 68.5% of overweight & obese had excess sweet in corresponding to 53.3% of normal weight students(P <0.05).

The percentage of high consumption of sport drink is higher among the overweight & obese (19.2%) than among the normal weight students (10.9%). The difference is statistically significant (P <0.05).

The table and chart (6) show that the relation between students' weight and scores of some dietary habits which is statistically significant (P <0.001). In students with average and below average scores in dietary habits, the percentage is higher in overweight & obese 42.5% and 6.8% respectively than in normal weight students 25.7% and 6.1% respectively. But in students with excellent and good scores in dietary habits, the percentage is higher in normal weight students (25.8% and 42.4%) respectively than in overweight & obese students (19.2% and 31.5%) respectively.

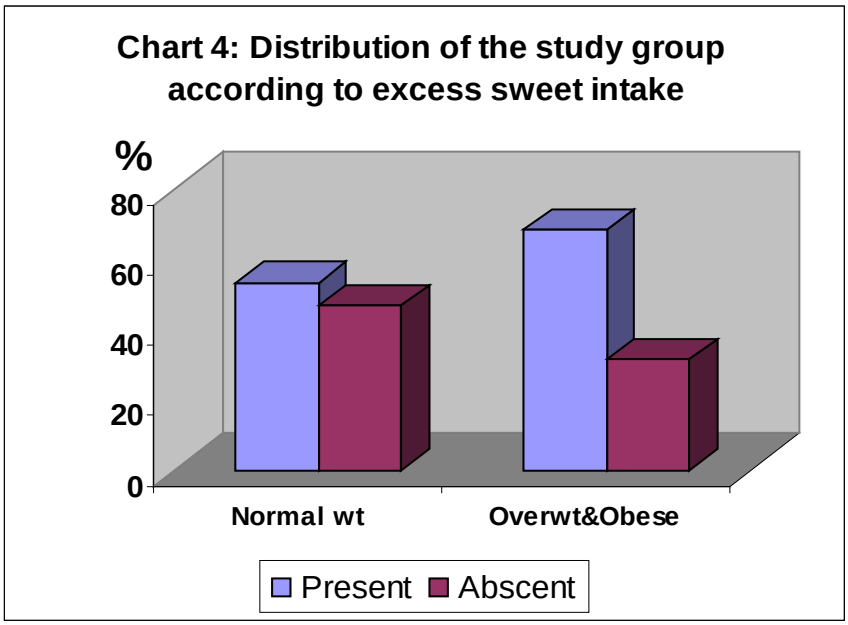
Chart 4: Distribution of the study group according to excess sweet intake
%
80
60
40
20
0
Normal wt
Overwt&Obese
Present
Abscent

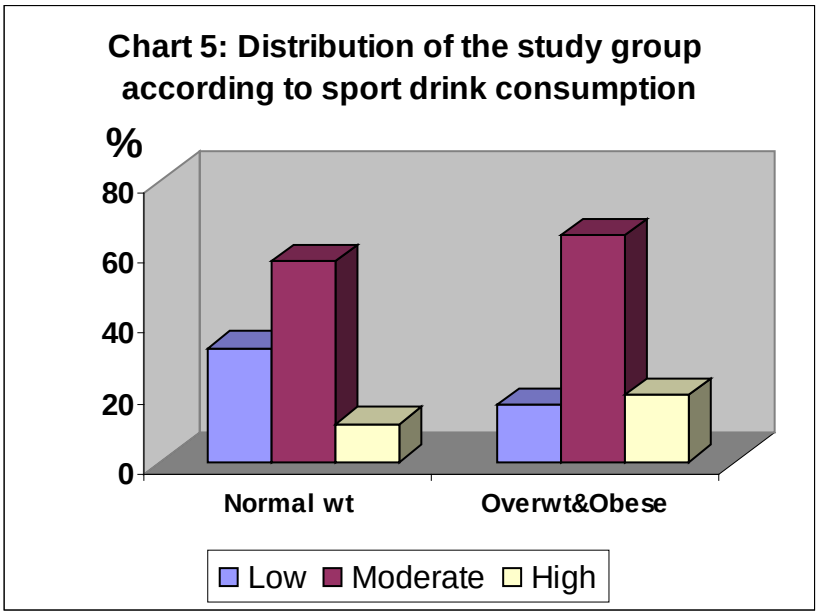
Chart 5: Distribution of the study group according to sport drink consumption
%
80
60
40
20
0
Normal wt
Overwt&Obese
Low
Moderate
High

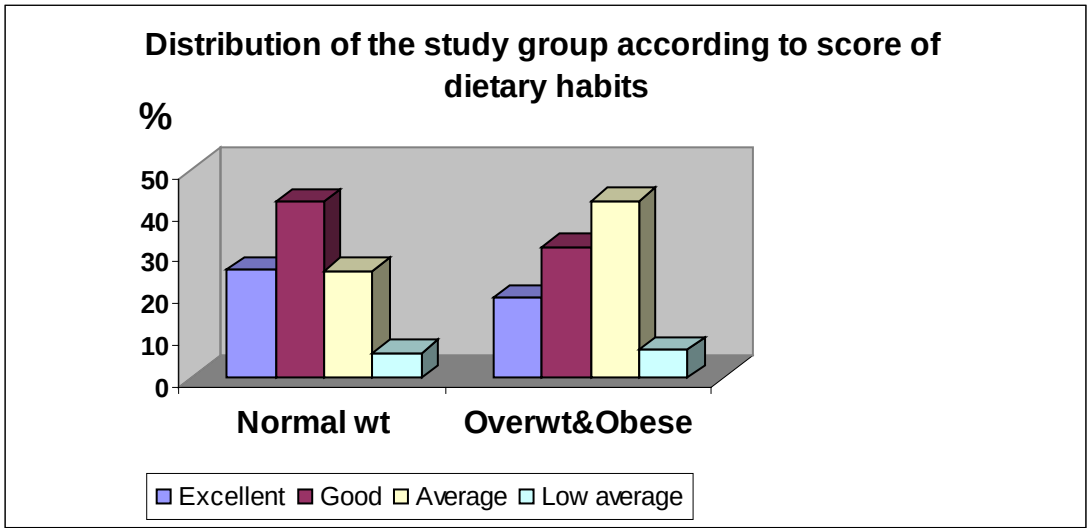
Distribution of the study group according to score of dietary habits
%
50
40
30
20
10
0
Normal wt
Overwt&Obese
Excellent
Good
Average
Low average

Figure (6)

Table (5): Distribution of the study group according to dietary meals and weight.

Body weight / Dietary meals	Normal weight No. = 458		Overweight and obese No. = 146		Total No. = 604	
	No	%	No	%	No	%
Home eating						
- Alone	129	28.1	26	17.8	155	25.6
- With family	208	45.4	31	21.2	239	39.6
- Outside the home	121	26.4	89	61.0	210	34.8
X^2 = 58.9 **P** = <0.001						
Meals per day						
-≤ 3	422	92.1	134	91.8	556	92.1
-> 3	36	7.9	12	8.2	48	7.9
Time of feeding						
- Eating at regular time	314	68.6	33	22.6	347	57.5
- Eating at irregular time	144	31.4	113	77.4	257	42.5
X^2 = 93.8 **P** = <0.00						
Causes of eating in between meal						
- Eating with friends	95	20.7	27	18.5	122	20.2
- Good appearance of food	102	22.3	42	28.8	144	23.8
- To motivate children to eat	53	11.6	28	19.2	81	13.4
- From pouring sensation	96	20.9	31	21.2	127	21.1
- Without reason	112	24.5	18	12.3	130	21.5
X^2 = 14.6 **P** = <0.001						

This table and charts (7, 8, 9) show that there are statistically significant relationships between dietary meals and obesity. The higher percentage of overweight & obesity among students who ate outside their home (61.0%), at irregular time (77.4%) and ate in between meals due to good appearance of food (28.8%). On the other hand the higher percentage of normal weight among students who ate with their family (45.4%), at regular time (68.6%) and ate without reason (24.5%). These differences are statistically significant (P <0.001).

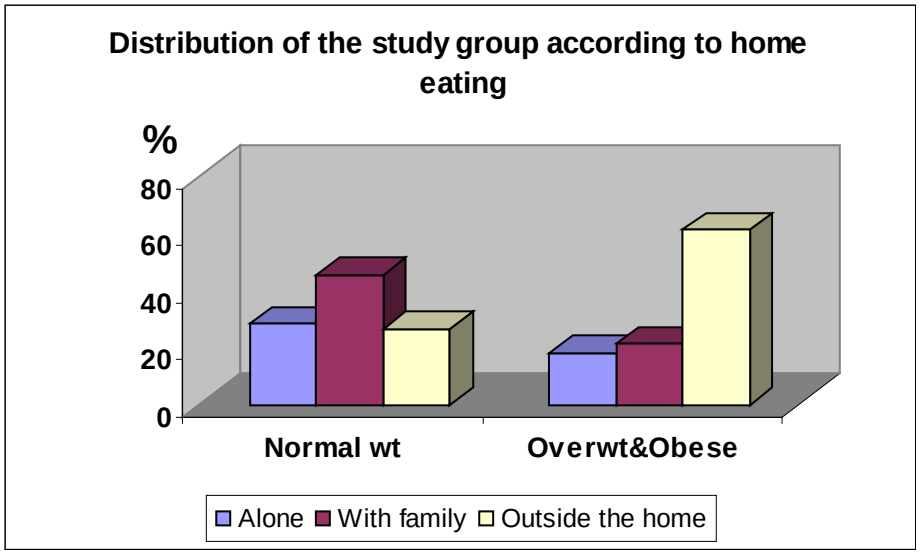

Figure (7)

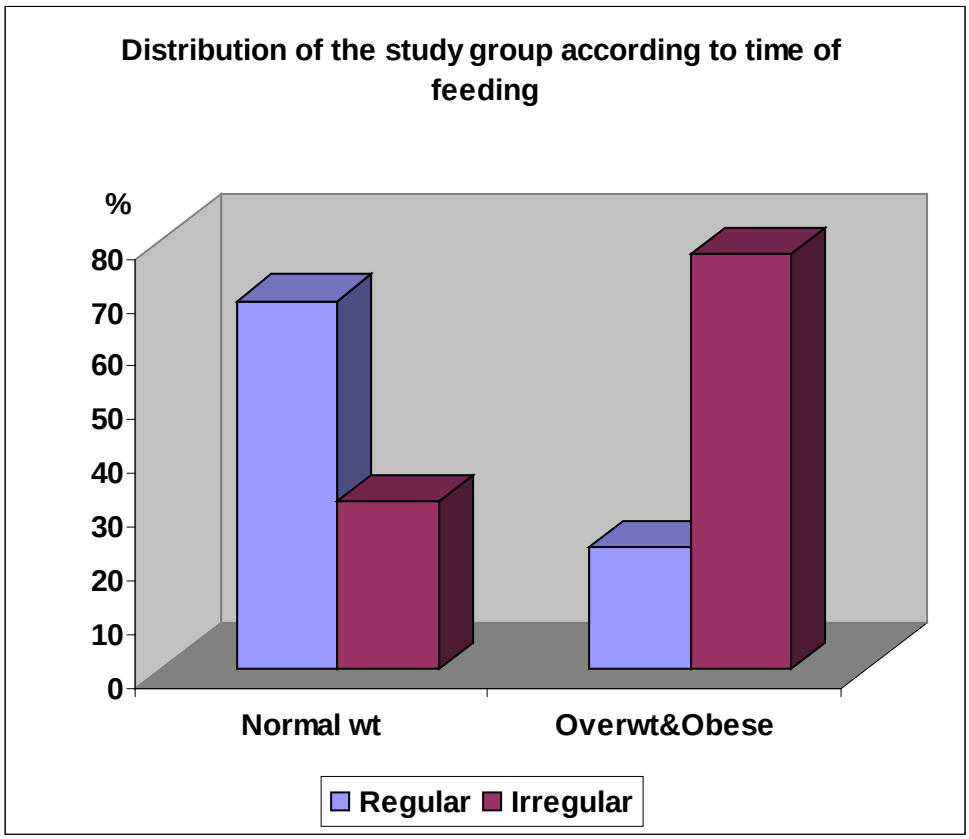

Figure (8)

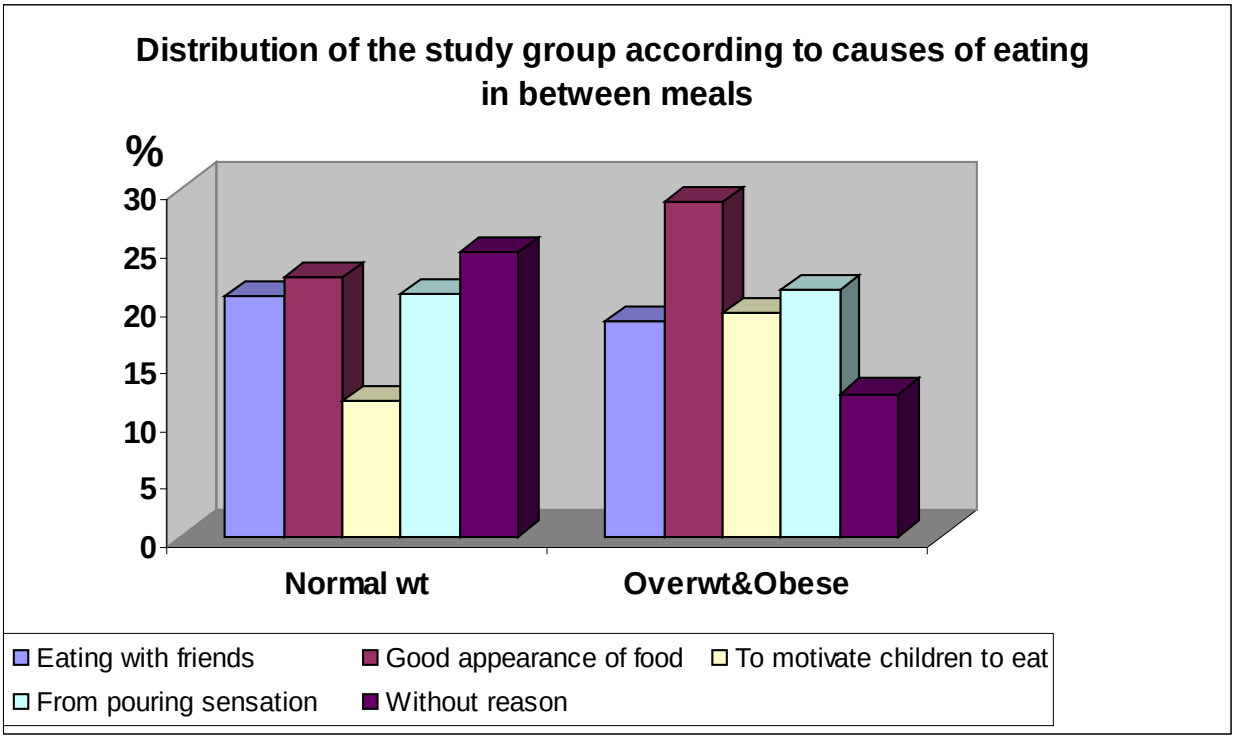
Distribution of the study group according to causes of eating in between meals
%
30
25
20
15
10
5
0
Normal wt
Overwt&Obese
Eating with friends
Good appearance of food
To motivate children to eat
From pouring sensation
Without reason

Figure (9)

Table (6): Distribution of the study group according to practicing of physical activity and weight.

Body weight / Ways of physical activity	Normal weight no.= 458		Overweight and Obese no= 146		Total no.= 604		Z	P
	No	%	No.	%	No	%		
1-E**xercise**								
- No	210	45.9	84	57.5	294	48.7	1.76	<٠.٠٥
- Mild	202	44.1	46	31.5	248	41.1	2.07	<٠.٠٥
- Moderate	24	5.2	6	4.1	30	4.9	0.53	>٠.٠٥
- Vigorous	22	4.8	10	6.9	32	5.3	0.94	>٠.٠٥
2-Means of transport								
- On foot	152	33.2	30	20.6	182	30.1	2.42	<0.05
- Public transport	266	58.1	52	35.6	318	52.7	3.26	<0.01
- Private means	40	8.7	64	43.8	104	17.2	8.9	<0.001

The table and chart (10) show that more than half (57.5%) of overweight & obese students were not practicing exercise in corresponding to 45.9% of normal weight students, this difference is statistically significant (P <0.05).

There is statistically significant difference between the percentages of students having normal weight (44.1%) and that of overweight & obese students who practicing mild exercise (P <0.05). On the other hand there is no statistical significant difference between the percentages of normal weight students and that of overweight & obese students who practicing moderate and vigorous exercise (P >0.05).

The table and chart (11) demonstrate that statistical significant differences between the percentages of students having normal weight and that of overweight & obese students who were walking on foot (33.2%& 20.6% respectively), who were using public transport (58.1% &35.6% respectively) and who were using private mean of transport (8.7%& 43.8% respectively).

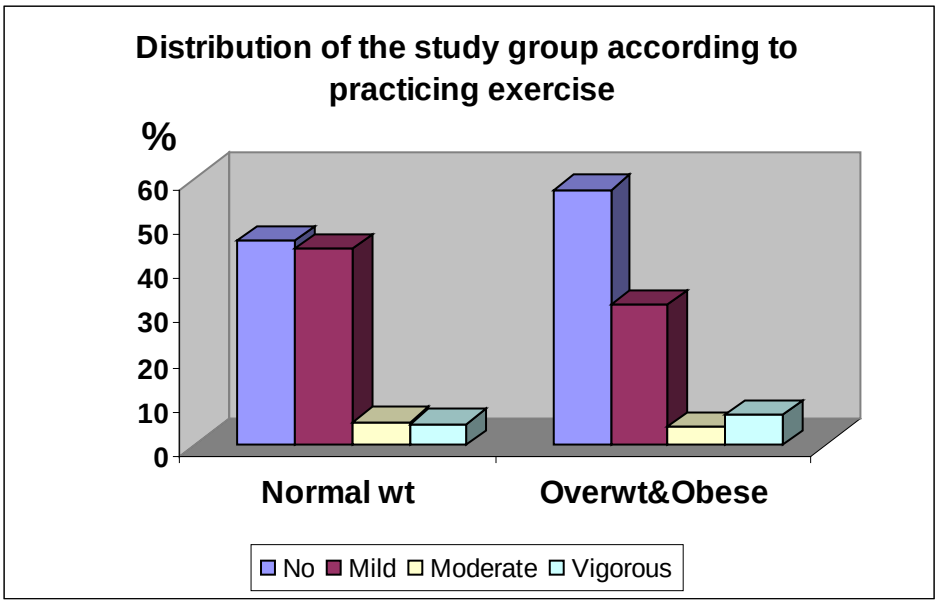

Figure (10)

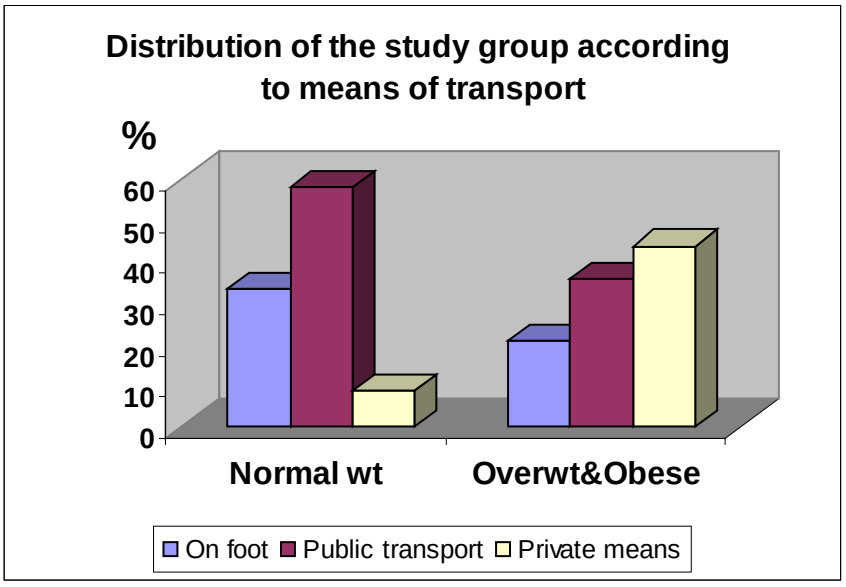

Figure (11)

Table (7): Distribution of the study group according to indoor environment and weight.

Body weight / Indoor environment	Normal weight no=458		Overweight and Obese no.= 146		Total no.= 604		Corrected X^2	P
	No.	%	No	%	No	%		
Sitting hours/day (TV+ reading....)								
< 10h	290	63.3	62	42.5	352	58.3	١٩.٨	<٠.٠٠١
10h+	168	36.7	84	57.5	252	41.7		
Sleep hours								
< 8h	156	34.1	48	32.9	204	33.8	0.07	>0.05
8h+	302	65.9	98	67.1	400	66.2		

This table and chart (12) show that the higher percentages of normal weight students (63.3%) had less than 10 hours TV setting or reading /day and the higher percentages of overweight & obese students (57.5%) had more than 10 hours TV setting or reading /day. This is statistically significant (P <0.001).

The table also, shows that the higher percentages of normal weight students (34.1%) had less than 8 hours sleep /day and the higher percentages of overweight & obese students (67.1%) had more than 8 hours sleep/day. This is statistically insignificant (P >0.05).

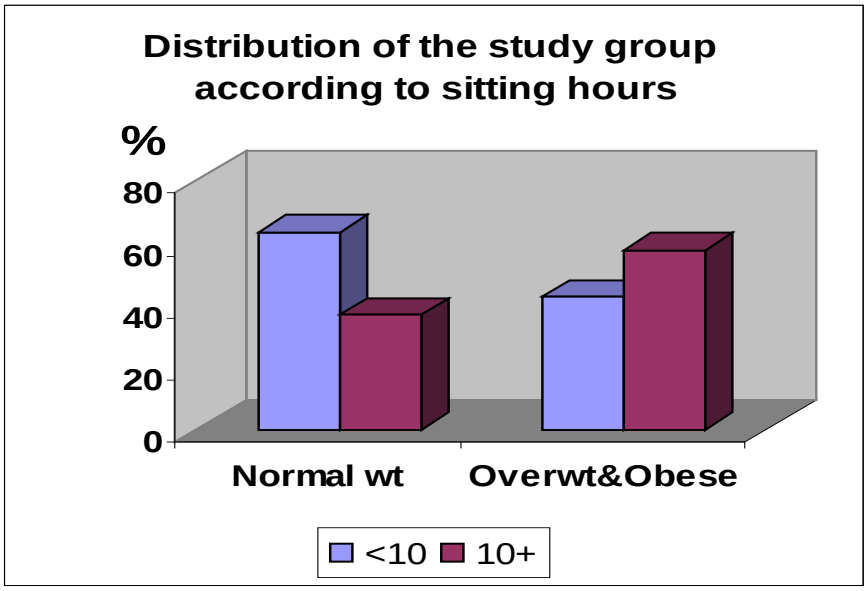
Distribution of the study group according to sitting hours
%
80
60
40
20
0
Normal wt
Overwt&Obese
<10
10+

Figure (12)

Table (8): Distribution of the study group according to diseases and weight.

Body weight / Diseases	Normal weight no=458		Overweight and Obese no.= 146		Total no.= 604		Z	P
	No	%	No	%	No.	%		
Hypertension	17	3.7	6	4.1	23	100	٠.٢١	>0.05
Varicose veins	35	7.6	16	10.9	51	100	١.٢	>0.05
Joint pain	36	7.9	9	6.2	45	100	٠.٦٥	>0.05
Psychological problems	48	10.5	56	38.4	104	100	٧.٠٧	<٠.٠٠١

This table and chart (13) demonstrate that the percentage of psychological problems among overweight & obese students is higher (38.4%) than that among normal weight students (10.5%). This difference is statistically significant (P <0.001). On the other hand there are no statistical significant differences between the percentages of hypertension, varicose veins and Joint pain among overweight & obese and normal weight students (P >0.05).

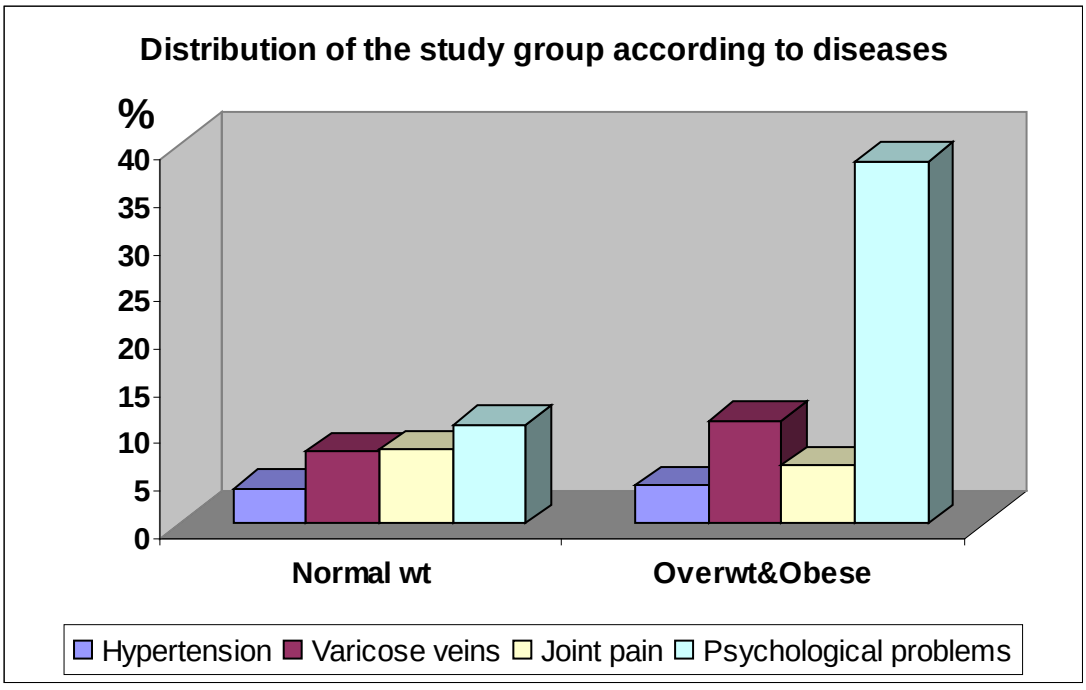
Distribution of the study group according to diseases
%
40
35
30
25
20
15
10
5
0
Normal wt
Overwt&Obese
Hypertension
Varicose veins
Joint pain
Psychological problems

Figure (13)

Table (9): Distribution of the study group according to medications and weight.

Body weight / Medications	Normal weight		Overweight and Obese		Total		Z	P
	No	%	No	%	No	%		
Nothing	٣٧٢	٨١.٢	94	64.4	466	100	٢.٠٢	<0.05
Vitamins	70	١٥.٣	12	٨.٢	82	100	٢.٠٢	<0.05
Appetite suppressant drugs	12	٢.٧	26	١٧.٨	38	100	٦.٣٧	<٠.٠٠١
Corticosteroids	2	٠.٤	9	٦.٢	11	100	٤.٤٧	<٠.٠٠١
Antidepressant drugs	2	٠.٤	5	٣.٤	7	100	٢.٩٢	<٠.٠٠١

The table and chart (14) show that 15.3% of normal weight students were using vitamins while, only 8.2% of overweight & obese were using them, with statistical significant difference (P <0.05). On the other hand higher percentages of overweight & obese using appetite suppressant, corticosteroids and antidepressant drugs (17.8%, 6.2%and 3.4% respectively) more than that used by normal weight students (2.7%, 0.4%and 0.4% respectively). These differences are statistically significant (P <0.001).

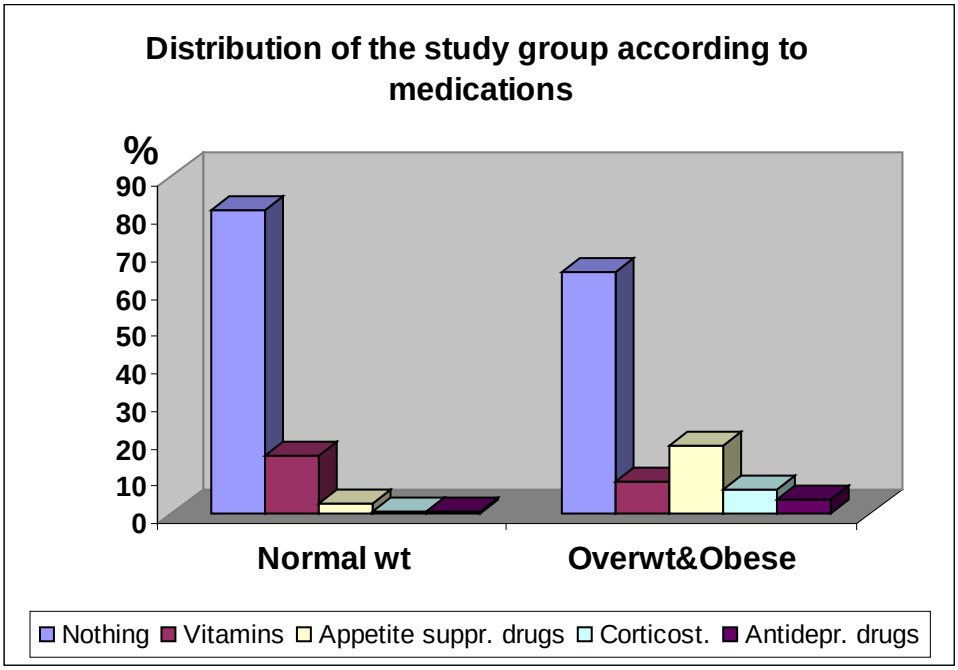
Distribution of the study group according to medications
%
90
80
70
60
50
40
30
20
10
0
Normal wt
Overwt&Obese
Nothing
Vitamins
Appetite suppr. drugs
Corticost.
Antidepr. drugs

Figure (14)

Table (10): Distribution of depression among the study group.

Body weight / Depression scale	Normal weight		Overweight and Obese		Total	
	No.	%	No.	%	No.	%
No	448	97.9	106	72.6	554	91.7
Mild	6	1.3	30	20.6	36	6.0
Moderate	2	0.4	6	4.1	8	1.3
Sever	2	0.4	4	2.7	6	1.0
Total	458	100.0	146	100.0	604	100.0
Corrected X^2 = 93.6 **P =** <0.001						

This table and chart (15) show that higher percentages of normal weight students (97.9%) have no depression while overweight & obese students have mild (20.6%), moderate (4.1%) and sever depression (2.7%) higher than that among normal weight students(1.3%, 0.4% and 0.4%respectively) (P <0.001).

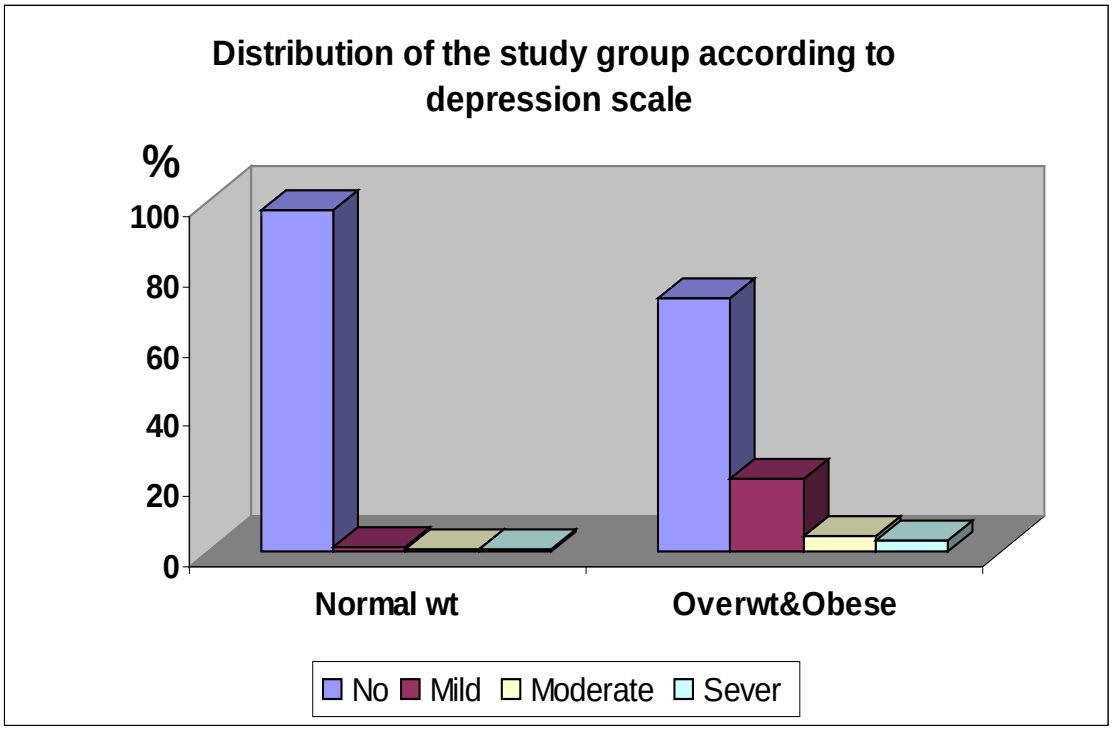
Distribution of the study group according to depression scale
%
100
80
60
40
20
0
Normal wt
Overwt&Obese
No
Mild
Moderate
Sever

Figure (15)

Table (11): Distribution of the study group according to attitude of parents towards body weight.

Body weight / Attitude of parents	Normal weight no= 458		Overweight and Obese no.= 146		Total no.= 604		Z	P
	No.	%	No	%	No	%		
Mother opinion								
- Pleased	208	45.4	60	41.1	268	44.4	٠.٦٨	>0.05
- Refuse you	2	0.4	0	0.0	2	0.3	0.8	>0.05
- Great fear	222	48.5	66	45.2	288	47.7	0.5	>0.05
-Continuous blaming	26	5.7	20	13.7	46	7.6	3.18	<٠.٠١
Father opinion								
- Pleased	264	57.6	72	49.3	336	55.6	1.77	<0.05
- Refuse you	12	2.6	6	4.1	18	3.0	0.91	>0.05
- Great fear	158	34.5	58	39.7	216	35.8	1.15	>0.05
- Continuous blaming	24	5.2	10	6.9	34	5.6	0.71	>0.05
Brothers relationship								
- Playing with them	334	72.9	100	68.5	434	71.9	0.55	>0.05
- Refusing to play	70	15.3	16	10.9	86	14.2	1.21	>0.05
- Quarreling with them	54	11.8	30	20.6	84	13.9	2.47	<0.05

This table illustrates that there is no statistical significant differences between the percentages of sense of mothers (pleased, refusing and great fear) among normal weight and overweight & obese students (P >0.05) while, the percentages of mothers who continuous blaming is higher among overweight & obese students (13.7%) than that among normal weight students (5.7%), with statistical significant difference (P <0.01).

Also, the table shows that, there is no statistical significant differences between the percentages of sense of fathers (refusing, great

fear and continuous blaming) among normal weight and overweight & obese students (P >0.05). While, the percentage of fathers who are pleased is higher among normal weight students (57.6%) than that among overweight & obese students (49.3%). The difference is statistically significant (P <0.05).

This table and chart (16) show that the percentage of the students who were playing with their brothers is higher among normal weight students (72.9%) than that among overweight & obese students (68.5%). Also, the percentage of the students who are refusing to play with their brothers is higher among normal weight students (15.3%) than that among overweight & obese (10.9%). These differences are statistically insignificant (P >0.05). On the other hand there is statistical significant difference between the percentage of the students who are quarreling with their brothers which is higher among overweight & obese students (20.6%) than that among normal weight students (11.8%) (P <0.05).

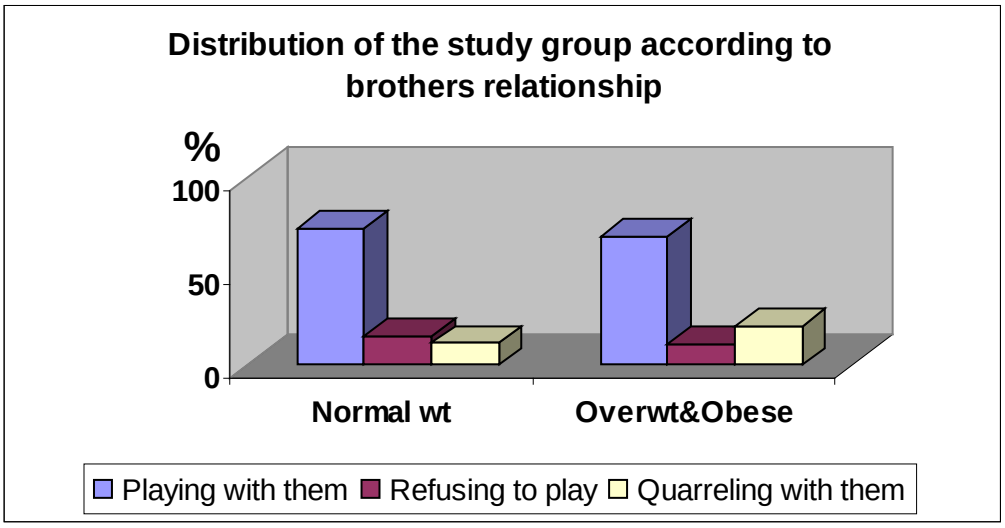
Distribution of the study group according to brothers relationship
%
100
50
0
Normal wt
Overwt&Obese
Playing with them
Refusing to play
Quarreling with them

Figure (16)

Table (12): Distribution of the study group according to academic performance and weight.

Body weight / Academic performance	Normal weight no= 458		Overweight and Obese no.= 146		Total no.= 604		Z	P
	No.	%	No	%	No	%		
Academic success								
50%- 64.9%	172	37.5	76	52.1	248	41.1	2.38	<0.05
65%- 74.9%	130	28.4	38	26.0	168	27.8	0.47	>0.05
75%- 84.9%	86	18.8	21	14.4	107	17.7	1.1	>0.05
≥85%	70	15.3	11	7.5	81	13.4	2.23	<0.05
School failure								
- Previous failure	0	0	2	1.4	2	0.3	٠.١٤	>0.05
- No failure	458	100.0	144	98.6	602	99.7	٠.١٤	>0.05
School absence								
- No absence	22	4.8	2	1.4	24	4.0	1.81	<0.05
-≤ 1 (month)	54	11.8	22	15.1	76	12.6	0.97	>0.05
-> 1 (month)	382	83.4	122	83.5	504	83.4	0.02	>0.05
School attention								
- Present	382	83.4	120	82.2	502	83.1	0.14	>0.05
- Absent	76	16.6	26	17.8	102	16.9	0.31	>0.05
Peer relationship								
- Playing with them	404	88.2	118	80.0	522	86.4	0.84	>0.05
- Refusing to play	38	8.3	22	15.1	60	9.9	2.26	<0.05
- Quarreling with them	16	3.5	6	4.1	22	3.7	0.34	>0.05

The table and chart (17) show that higher percentages of overweight & obese students who had their last degree as “50 %- 64.9 %”(52.1%) while higher percentages of normal weight students had their last degree as“≥**85 %**” (15.3%) These differences are statistically significant (P <0.05).

Also, the table shows that, the percentage of students with history of previous failure among overweight & obese is 1.4% which is statistically insignificant (P > 0.05). The percentage of students with no school absence is higher among normal weight students (4.8%) than that among overweight & obese students (1.4%) which is statistically significant (P < 0.05). On the other hand there is statistically insignificant difference between the percentages of students who are showing no school attention among overweight & obese (17.8%) and that among normal weight students (16.6%) (P > 0.05).

This table and chart (18) show that the percentage of the students who are refusing to play with their peers is significantly higher among overweight & obese students (15.1%) than that among normal weight students (8.3%) (P <0.05).

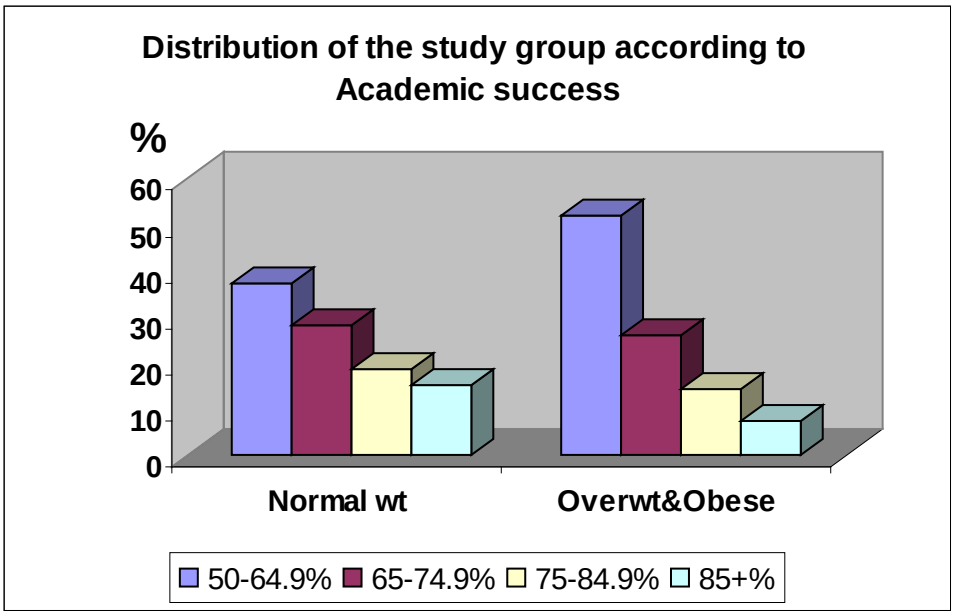

Figure (17)

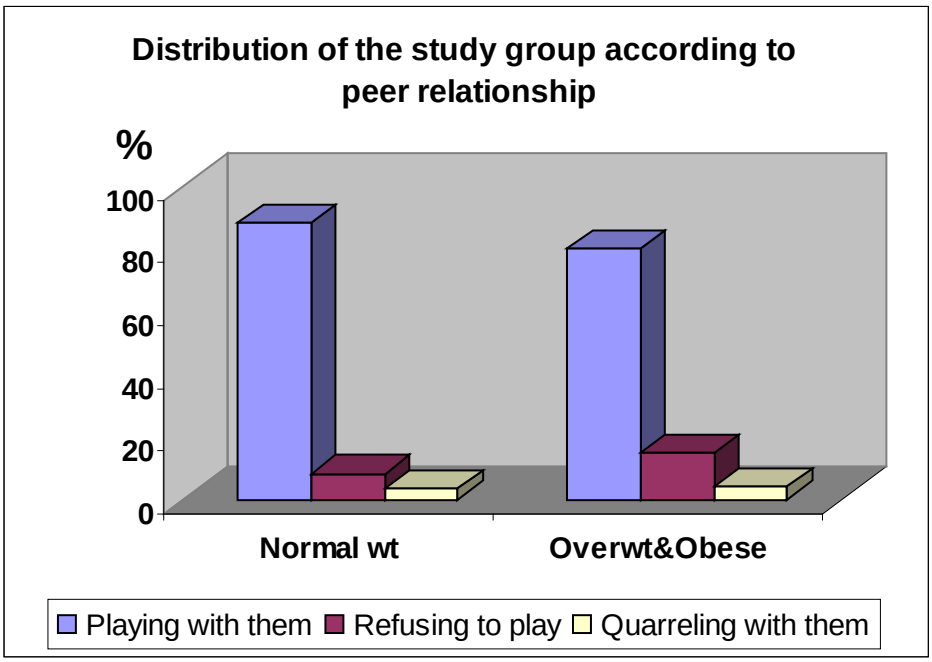

Figure (18)