COMPARISION OF HAEMOGLOBIN PERCENTAGE AND NUTRITIONAL STATUS OF POST GRADUATE GIRL STUDENTS RESIDING IN HOSTEL, RENTED ROOMS AND HOME

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ABSTRACT

The most crucial segment of our population from the point of view of the quality of our future generation is today's girls who are just on the threshold of marriage and motherhood. These girls are our future home maker. Their attainments and competence will be the major determinants of the health and nutrition of children of the next generation. The health condition of these girls needs more attention. Todays Girl's are getting educated and for their education they have to leave their homes and stay in hostels or rented rooms. This results in change in the surroundings and diet leading to stress and nutritional deficiencies. So it was thought interesting to compare the diet or nutritional status of girl students staying away from home likes in hostels or rented rooms with their hemoglobin. Change in the diet during vacations was also correlated with change in hemoglobin percentage. The objectives of the present study was to estimate the hemoglobin percentage of girls in different conditions that is before and after vacation, before and after exam, before then correlate with their diet and comparing with the diet of girls in different groups that is girls in hostel, residing at rooms and staying at home. The results will be correlated with diet and accordingly recommendation count be given to the hostel authorities for the improvement of food quality .The girls will also be made aware of importance of proper nutrition and its effects on ability to concentrate on studies.

Key Words: Anaemia, Blood, Hemoglobin, Nutritional level.

INTRODUCTION

Blood is a specialized bodily fluid in animals that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells (Franklin Institute Inc., 2009). Hemoglobin is the iron containing oxygen transport metalloprotein in the red blood cells (Maton, 1993). Hemoglobin has an oxygen binding capacity of between 1.36 and 1.37 mL oxygen per hemoglobin (Domiguez de Villota, 1981), which increases the total blood oxygen capacity senventy fold (Costanzo and Linda, 2007).Iron is an essential elements for the formation of hemoglobin. Most of the iron in the body is reutilized and excess is stored in liver and spleen (Daruwala, 1996) When the diet does not contain sufficient amounts of iron, anaemia develope. It is a gradual process and takes several months to show up a normal person has about 14-15g of hemoglobin. Any person whose hemoglobin level is below 12mg / 100mL blood is considered anaemic with expectation of pregnant women. About 80% of the total anaemic cases are due to iron deficiency, and the rest are due to deficiency of nutrient like folate and vitamin B12. Folic acid and vitamin B12 are important for the production of blood cells (Nair, 1990).Man rarely suffer from iron deficiency due to poor diet. However, when new blood has to be made, the iron requirement is greatly increased. An adult women require 35-45 mg of iron per kg body weight or a total of 250 mg of iron. It plays a major role in the formation of hemoglobin and myoglobin. Most of the iron in the body is located in the hemoglobin of circulating red blood cells. Whereas in many normal menstruating women, almost all of the iron is in red blood cells because of their limited iron stores (Nair, 1990). Anaemia due to lack of iron in the blood is the commonest nutritional disorder, particularly likely to affect women (Bingham, 1977).

MATERIALS AND METHODS

Study groups Hemoglobin percentage of girls residing in hostel, rented rooms and at home was estimated. Each group contained 16 girls. Diet history was taken and nutritional values were calculated.

From their portion size, diet was divided as cereals, pulses, eggs, milks, roots vegetables according to standard chart, and also value of energy, protein, fats and carbohydrate were calculated.

Calculation of diet

Portion sizes for Menu plan, Portion Size of Foods (raw) and Nutrients

Food groups	g / Portion	Energy (Kcal)	Protein (g)	Carbohydrate (g)	Fat (g)
Cereals & millets	30	100	3.0	20	0.8
Pulses	30	100	6.0	15	0.7
Egg	50	85	7.0	-	7.0
Meat / Chicken / Fish	50	100	9.0	-	7.0
Roots & Tubers	100	80	1.3	18	-
Green leafy vegetables	100	45	3.6	-	0.4
Other vegetables	100	30	1.7	-	0.2
Fruits	100	40	-	10	-
Sugar	5	20	-	5	-
Fats & oils (visible)	5	45	-	-	5.0

Estimation of hemoglobin percentage Hemoglobin was determined by Sahli's Method (Sood., 1990).

RESULTS AND DISCUSSION

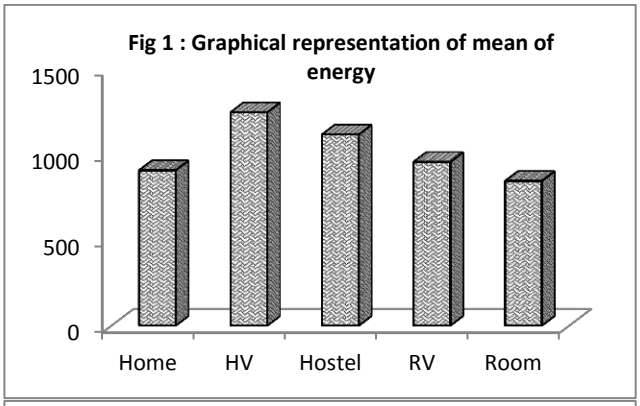
Hemoglobin percentage of girl students residing in hostel, rented rooms and in home was estimated and compared with their diet. Their diet history was taken nutritional values were calculated and statistically analyzed. A significant difference in the means of energy, fats, protein and carbohydrates was seen in the diet of hostel, rooms and home.

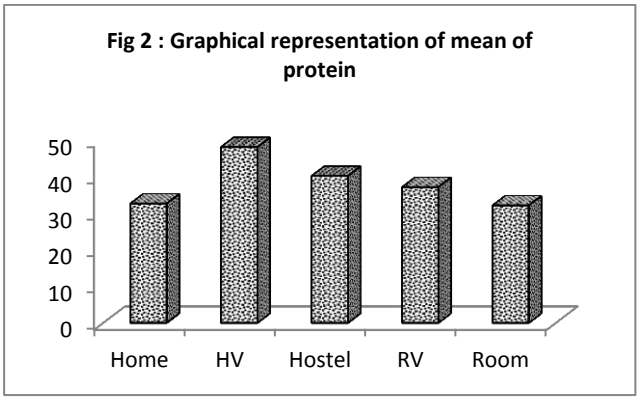
Table 1: One-way Analysis of Variance of Energy

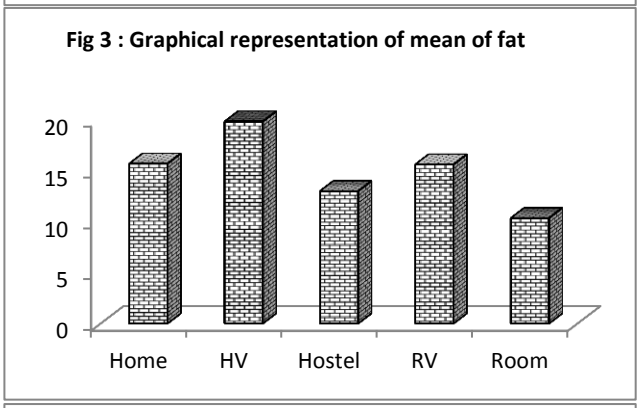
Source of variance	df	sum of squares	mean variance	F
Between groups	4	1714560	428640	8.2575
within groups	75	3893184	51909.12	
Total	79	5607744		

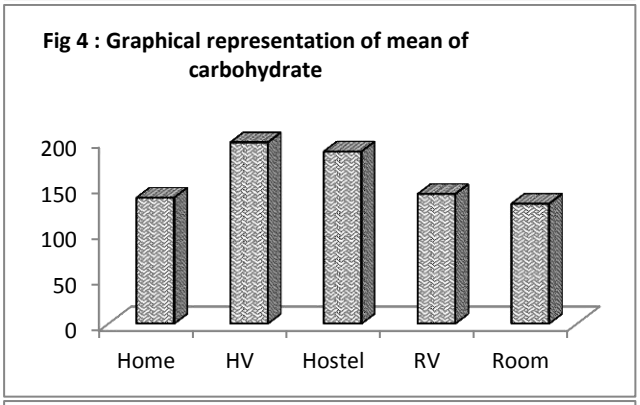
Table 2: Significant difference between pairs of means of energy

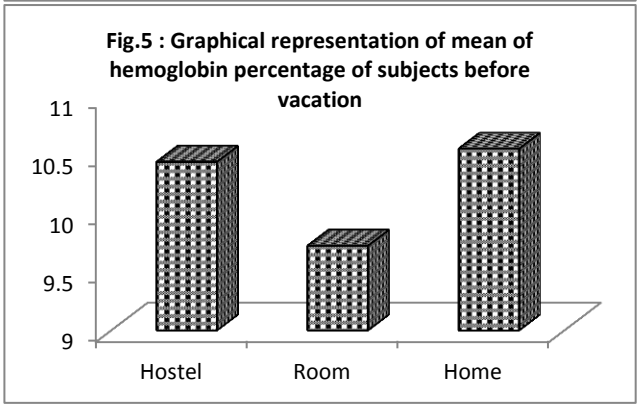
Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Home	905.938	HV	1244.063	338.125	54.7281	*
Home	905.938	Hostel	1115	209.063	254.7281	%
Home	905.938	RV	955	49.0625	254.7281	%
Home	905.938	Room	844.0625	61.875	254.7281	%
HV	1244.06	Hostel	1115	129.063	254.7281	%
HV	1244.06	RV	955	289.063	254.7281	*
HV	1244.06	Room	844.0625	400	254.7281	*
Hostel	1115	RV	955	160	254.7281	%
Hostel	1115	Room	844.0625	270.938	254.7281	*
RV	955	Room	844.0625	110.938	254.7281	%

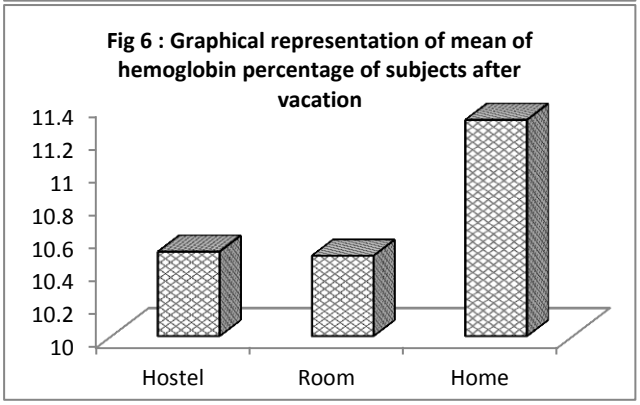


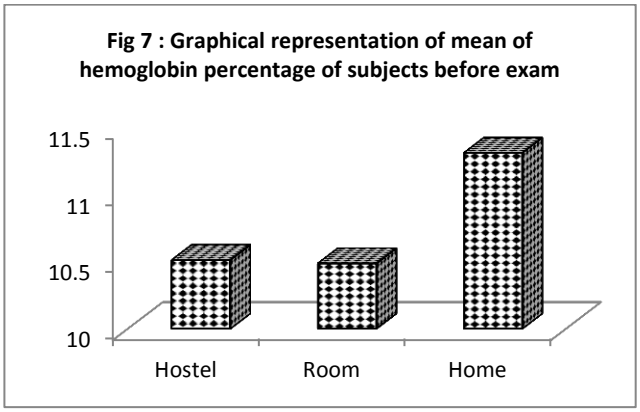












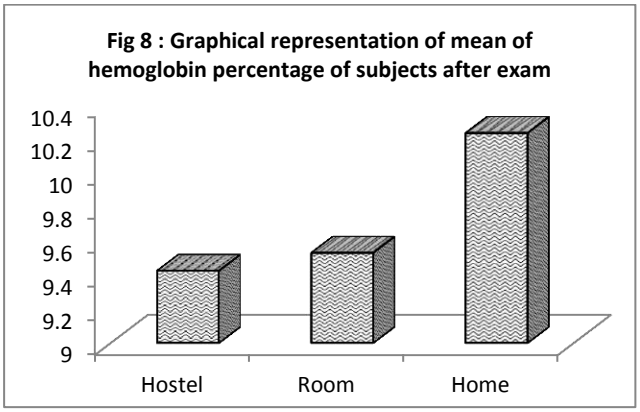


Table 3: One-way Analysis of Variance of protein

Source of variance	df	sum of squares	mean variance	F
Between groups	4	2728.078	682.0196	7.5112
within groups	75	6810.032	90.8004	
Total	79	9538.109		

Table 4: Significant Difference between pairs of means of protein

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Home	32.625	HV	48.0688	15.4438	10.6537	*
Home	32.625	Hostel	40.1875	7.5625	10.6537	%
Home	32.625	RV	37.1125	4.4875	10.6537	%
Home	32.625	Room	32.1125	0.5125	10.6537	%
HV	48.0688	Hostel	40.1875	7.8813	10.6537	%
HV	48.0688	RV	37.1125	10.9563	10.6537	*
HV	48.0688	Room	32.1125	15.9563	10.6537	*
Hostel	40.1875	RV	37.1125	3.075	10.6537	%
Hostel	40.1875	Room	32.1125	8.075	10.6537	%
RV	37.1125	Room	32.1125	5	10.6537	%

Table 5: One-way Analysis of Variance of fat

Source of variance	df	sum of squares	mean variance	F
Between groups	4	791.504	197.876	4.6287
within groups	75	3206.227	42.7497	
Total	79	3997.731	3997.731	

Table 6: Significance difference between Pairs of Means of fat

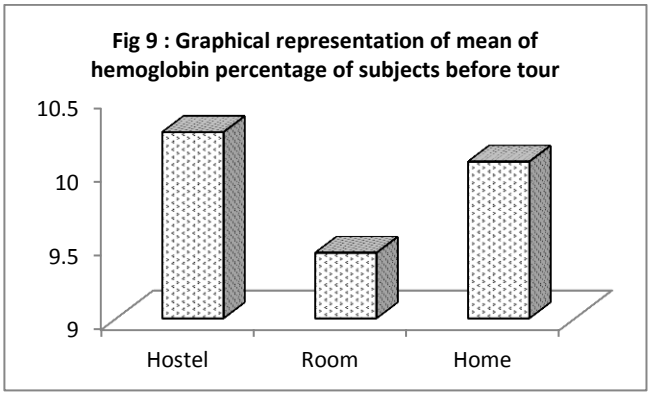
Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Home	15.6375	HV	19.7562	4.1187	7.3101	%
Home	15.6375	Hostel	12.9438	2.6937	7.3101	%
Home	15.6375	RV	15.5563	0.0812	7.3101	%
Home	15.6375	Room	10.3063	5.3312	7.3101	%
HV	19.7562	Hostel	12.9438	6.8125	7.3101	%
HV	19.7562	RV	15.5563	4.2	7.3101	%
HV	19.7562	Room	10.3063	9.45	7.3101	*
Hostel	12.9438	RV	15.5563	2.6125	7.3101	%
Hostel	12.9438	Room	10.3063	2.6375	7.3101	%
RV	15.5563	Room	10.3063	5.25	7.3101	%

Table 7: One-way Analysis of Variance of carbohydrate

Source of variance	df	sum of squares	mean variance	F
Between groups	4	62635.13	15658.78	10.8133
within groups	75	108608.3	1448.11	
Total	79	171243.4		

Table 8: Significance difference between Pairs of Means of carbohydrate

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Home	137.6875	HV	198	60.3125	42.5457	*
Home	137.6875	Hostel	188.125	50.4375	42.5457	*
Home	137.6875	RV	141.5625	3.875	42.5457	%
Home	137.6875	Room	130.9375	6.75	42.5457	%
HV	198	Hostel	188.125	9.875	42.5457	%
HV	198	RV	141.5625	564375	42.5457	*
HV	198	Room	130.9375	67.0625	42.5457	*
Hostel	188.125	RV	141.5625	46.5625	42.5457	*
Hostel	188.125	Room	130.9375	57.1875	42.5457	*
RV	141.5625	Room	130.9375	10.625	42.5457	%



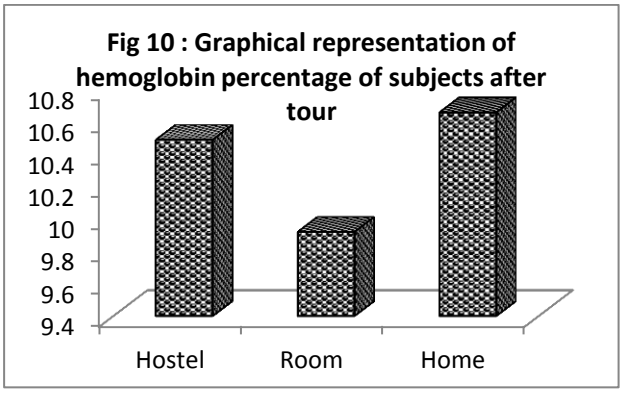


Table 9:One-way Analysis of variance of hemoglobin percent before vacation

Source of variance	df	sum of squares	mean variance	F
Between groups	2	6.5073	3.2537	1.6843
within groups	45	86.9287	1.9317	
Total	47	93.436		

Table 10: Significance difference between pairs of means of hemoglobin percent BV

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	10.4438	Room	9.725	0.7188	1.2451	%
Hostel	10.4438	Home	10.5563	0.1125	1.2451	%
Room	9.725	Home	10.5563	0.8313	1.2451	%

Table 11: One-way Analysis of Variance of hemoglobin percent after Vacation

Source of variance	df	sum of squares	mean variance	F
Between groups	2	7.0464	3.5232	3.0922
within groups	45	51.2725	1.1394	
Total	47	58.3189		

Table 12: Significance difference between pairs of means of hemoglobin percent AV

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	10.5125	Room	10.4875	0.025	0.9562	%
Hostel	10.5125	Home	11.3125	0.8	0.9562	%
Room	10.4875	Home	11.3125	0.825	0.9562	%

Table 13: One-way analysis of variance of hemoglobin percent before exam

Source of variance	df	sum of squares	mean variance	F
Between groups	2	7.0464	3.5232	3.0922
within groups	45	51.2725	1.1394	
Total	47	58.3189		

Table 14: Significance difference between pairs of means of hemoglobin percent of BE

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	10.5125	Room	10.4875	0.025	0.9562	%
Hostel	10.5125	Home	11.3125	0.8	0.9562	%
Room	10.4875	Home	11.3125	0.825	0.9562	%

Table 15: One-way analysis of variance of hemoglobin per cent after exam

Source of variance	df	sum of squares	mean variance	F
Between groups	2	6.2417	3.1208	2.4047
within groups	45	58.4019	1.2978	
Total	47	64.6436		

Table 16: Significance difference between pairs of means of hemoglobin percent of AE

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	9.425	Room	9.5313	0.1062	1.0205	%
Hostel	9.425	Home	10.2375	0.8125	1.0205	%
Room	9.5313	Home	10.2375	0.7063	1.0205	%

Table 17: One-way analysis of variance of hemoglobin per cent before tour

Source of variance	df	sum of squares	mean variance	F
Between groups	2	5.8306	2.9153	1.7744
within groups	45	73.9346	1.643	
Total	47	79.7651		

Table 18: Significance Difference Between Pairs of Means of hemoglobin per cent of BT

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	10.2625	Room	9.4438	0.8187	1.1483	%
Hostel	10.2625	Home	10.0625	0.2	1.1483	%
Room	9.4438	Home	10.0625	0.6187	1.1483	%

Table 19: One-way analysis of variance of hemoglobin percent after tour

Source of variance	df	sum of squares	mean variance	F
Between groups	2	4.7778	2.3889	1.7833
within groups	45	60.2813	1.3396	
Total	47	65.0591		

Table 20: Significance difference between pairs of means of hemoglobin per cent of AT

Group	Mean	Group	Mean	Dif .	Cri. Dif.	REM
Hostel	10.4875	Room	9.9188	0.5688	1.0368	%
Hostel	10.4875	Home	10.6563	0.1687	1.0368	%
Room	9.9188	Home	10.6563	0.7375	1.0368	%

In table 1, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5. Because the obtained 'F' is more than the table 'F' there is a significance difference between the groups and hence there is a need of applying Posthoc Test to see the differences.

In table 2, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5. There was rapid increased in energy from home to HV that is 905.93 to 1244.06. An energy value was not altered from home to hostel. Significant differences were observed from HV to RV, HV to room and hostel to room. The fig. 1 shows graphical representation of mean of energy.

In table 3, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5 because the obtained F is a significance difference between the groups and hence there is a need of applying Posthoc Test to see the differences.

While table 4 shows F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5. There was slight but significant increased in protein from home to HV which is 32.62 to 48.06. Protein value slightly decreased from HV to RV and HV to room, 48.06 to 37.10 and 48.60 to 32.11 respectivaly. The fig. 2 shows graphical representation of mean of protein.

Table 5 shows, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5 because the obtained F is more than the table F there is a significance difference between the groups and hence there is a need of applying Posthoc Test to see the differences.

In table 6, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5 There was slight decreased in fat values from HV to room that is 19.75 to 10.3. The fig. 3 shows graphical representation of mean of fat.

In table 7 F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5 Because the obtained F is more than the table F there is a significance difference between the groups and hence there is a need of applying Posthoc Test to see the differences.

While in table 8, F at 4 and 75 degree of freedom at 0.05 level of sig. is 2.5. There was a rapid increased in carbohydrate value from home to HV and home to hostel. Values increased from 137.68 to 198 and 137.68 to 188.12. And rapid decreased from HV to RV, HV to room, hostel to RV and hostel to room. The fig. 4 shows graphical representation of mean of carbohydrate.

In table 9, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

In table 10, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Hemoglobin percent was not altered during before vacation. Fig. 5 shows, graphical representation of mean of hemoglobin percentage of subjects before vacation.

In table 11, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

In table 12, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Hemoglobin level was not altered during after vacation. Mean values from hostel to room was 10.51 and 10.48 slight decreased in hemoglobin and slight increased in mean values were from hostel to home and room to home. Fig. 6 shows, graphical representation of mean of hemoglobin percentage of subjects after vacation.

In table 13, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

In table 14, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Hemoglobin percentage was not altered during before exam. There mean values were slightly altered from hostel to room, hostel to home and room to home. Fig. 7 shows, graphical representation of mean of hemoglobin percentage of subjects before exam.

In table 15, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

In table 16, F at 2 and 45 degree of freedom at 0.05 level of sig. 3.21. Significant difference was not observed in hemoglobin percent during after exam. Mean value from hostel to room, hostel to home and home were increased. Fig. 8 shows, graphical representation of mean of hemoglobin percentage of subjects after exam.

In table 17, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

In table 18, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Mean value of hemoglobin level was decreased from hostel to room and further increased from room to home during before tour. Fig. 9 shows, graphical representation of mean of hemoglobin percentage of subjects before tour.

In table 19, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Because the obtained F is less than the Table F there is no significance difference between the groups and hence there is no need of applying Posthoc Test to see the differences.

While in table 20, F at 2 and 45 degree of freedom at 0.05 level of sig. is 3.21. Hemoglobin percent was not altered during after tour. Fig. 10 shows, graphical representation of mean of hemoglobin percentage of subjects after tour.

Difference in the hemoglobin percentage of girls staying in hostel, rented rooms and homes was also detected. It was found that hemoglobin percentage of hostel girls and those residing in rooms were less than those staying at home. It was also seen that the hemoglobin percentage was increased in the vacations when girls visited their homes. From this it could be concluded that their room and hostel diet lacked proper nutrition. Majority of the students did not consume adequate amount of calories, protein, fats and carbohydrates.

Their diet was based on cereal. Wheat, rice, jawar were the main cereal consumed by them. The intakes of nutrition was considerably low in hostel diet or and in room diet.

Consumption of leafy vegetable, other vegetables, fruits, salads, oil, ghee, meat, eggs were low in their diet. During vacation, their hemoglobin level was more because quality and quantity of food was proper at home.

From this survey, it is concluded that the diet was directly affects hemoglobin level of girls. Moreover socio-economic differences in dietary knowledge and Hemoglobin percent concern seem to play a significant role in girls (Turrel *et al.*, 2005). Therefore, it is essential to improve nutritional status of girl who is further makers of family and society, hemoglobin level of girls must be improved. This can only be done by giving nutritional education and proper food.

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