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HAEMOGLOBIN LEVEL OF THE ADOLESCENTS AND ENERGY EXPENDITURE: IS THERE ANY RELATION BETWEEN TWO?

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ABSTRACT

Adolescents experience dramatic physical growth and development during puberty, which in turn appreciably increases their requirements for energy, protein, and other vitamins and minerals. Adolescents usually consume less of green leafy vegetable & Fruits and so usually suffer from Iron deficiency anemia. A good physical work capacity is a desirable attribute that depends on adequate intake of calories and iron. Iron deficiency anemia during adolescence may reduce physical work capacity and cognitive function.

The present study was conducted in Pusa block of Samastipur district with an objective to find out relationship between Haemoglobin level and energy expenditure of the adolescents. A sample of 120 adolescent students were selected from private and government school. Information on general background of the adolescent was collected through interview scheduled . The private school adolescent were giving more time in watching T.V., using networking sites and in their study while government school adolescent were giving more time in physical activities and domestic work. Most of the students of private and government school were having Haemoglobin. Level between 10-12g/dl. Which is considered as normal but 20 percent of the government school students were having 6-8g/dl as compared to private amongst whome none of the adolescents fall below this range. Still the total energy expenditure of government school students was more than private school students. Therefore this study suggest that the Haemoglobin. Level of large sample size and energy expenditure by them should further be done for coming to a conclusion.

Keywords:- Adolescent, Energy Expenditure, Haemoglobin, Physical activity, Food habit.

Introduction:-

UNICEF defines adolescents as person in the age group of 10 to 19 years. Adolescents experience dramatic physical growth and development during puberty, which in turn appreciably increases their requirements for energy, protein, and other vitamins and minerals.

Physical activity is another major lifestyle related health determinants. However such an important health protecting behaviour is seen to decline during adolescence. Adolescents usually consume less of green leafy vegetable & Fruits and so usually suffer from Iron deficiency Anemia. A good physical work capacity is a desirable attribute that depends on adequate intake of calories and iron. Iron deficiency anemia during adolescence may reduce physical work capacity and cognitive function. Physical work capacity is reduced because in iron, the decreases in Haemoglobin reduces the availability of oxygen to the tissue, which in turn affects the cardiac output. The WHO recommends that children and young people aged 5 to 17 years old should accumulate at least 1hour of moderate to vigorous intensity physical activity per day.

Therefore present study is aimed at the Haemoglobin level & Energy expenditure of private and Government school adolescent students of Pusa block of Samastipur district(Bihar).

Material and Method

Two private and Two Government Schools of Samastipur district of Bihar were selected. A sample of 120 adolescent students (60 each from private and government schools) aged between 13 to16 years were selected by purposive sampling method. General information regarding caste, religion, family size, and types of family as well as their socio-economic status was obtained from each subjects. To measure the energy expenditure a questionnaire was developed. Direct interview method was adopted to collect relevant information from the respondent. Total energy expenditure was computed by adding the full day energy expenditure for all the activities with energy expenditure for growth. This value was compared with the standard total daily energy expenditure as per WHO guidelines. The data have been represented in mean, SD and t-test table.

Result and discussion

General information about the subjects.

General information about the subjects has been presented in Table 1. Table 1 inferred that majority of the adolescent i.e., 41.6 percent and 38.4 percent from government and private school were of the age of 14 years followed by 33.4 percent and 26.6 percent of 15 years age group adolescent of government and private school. It is evident from the Table 1 that majority of the government school students i.e., 65 percent belonged to nuclear family followed by 26.6 percent of joint family and 8.3 percent of extended family. In private school, majority of the students belonged to nuclear family i.e., 53.3 percent followed by 36.6 percent of joint family and 10 percent of extended family.

Table 1 reflected that the family size of 1-4 members, the subjects in government and private schools were 20 percent and 28.3 percent. Students belonging to 5-7 family members were 63.3 percent in government school and 53.3 in private school. Family size, >7<10 were found 9 percent in government school adolescent and 15 percent in private school adolescent. The government and private school adolescent of family size 10 and > constitute 1.6 percent and 3.3 percent.

Table 1 further revealed that majority of the adolescents i.e., 63.3 percent from government school and 66.6 percent from private school were non-vegetarian followed by 16.6 percent and 30 percent lacto-vegetarian from government and private school. The vegetarian from government school constitute 18.3 percent and from private school 1.6 percent. The Ovo-vegetarian both from government and private school constitute 1.6 percent.

Table 1.General information of the subjects.

Particulars	**Subjects (N=120)**			
	Government school students (60)		**Private school students (60)**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
1.)Age(years)				
13	12	20	18	30
14	25	41.6	23	38.4
15	20	33.4	16	26.6
16	3	5.0	3	5.0
2.)Types of Family				
Nuclear	39	65	32	53.3
Joint	16	26.6	22	36.6

Extended	5	8.3	6	10
3) **Family size**				
1-4	12	20	17	28.3
5-7	38	63.3	32	53.3
>7<10	9	15	9	15
10 & >	1	1.6	2	3.3
4.)Food habits				
Vegetarian	11	18.3	1	1.6
Non-vegetarian	38	63.3	40	66.6
Ovo-vegetarian	1	1.6	1	1.6
Lacto-vegetarian	10	16.6	18	30

Life style patterns of the subjects.

Table 2 showed that the participation of subjects in various sports varies from government school to private schools. From the government school maximum subject i.e., 36.6 percent played cricket while no one played kho-kho and skipping while from private school maximum subjects i.e., 50 percent played cricket while no one played table tennis and chess.

The Table 2 also showed the participation of subjects in activities. The government school subject's participated maximum in watching T.V. (90%) while from private school maximum subjects participated in watching T.V., (95%). While from both the government and private school, adolescents participated minimum in walking.

Table 2 further inferred that more number of children from private school was participating in activity like walking, watching T.V. and networking while government school adolescent were participating more in cycling. This may be attributed to the fact that the socio-economic condition of almost private school adolescent was good compared to the government school adolescent. Ninety-five percent of private school adolescent and 90 percent of government school adolescent were watching T.V., 66.6 percent adolescent from private school and 71.6 percent from government school were doing cycling, 30 percent from private school and 23.3 percent adolescent from government school were doing morning or evening walk and 50 percent adolescent from private school and 41.6 percent from government were using networking sites.

Table No. 2. Life style patterns of subjects (N=120)

Parameters	**Subjects (N=120)**			
	Government (60)		**Private (60)**	
	Frequency	**Percentage**	**Frequency**	**Percentage**

A. Sports				
Cricket	22	36.6	30	50
Volleyball	8	13.3	6	10
Football	6	10	3	5
Caroom	7	11.6	12	20
Ludoo	6	10	5	8.3
Table tennis	4	6.6	-	-
Badminton	15	25	24	40
Kho-Kho	-	-	3	5
Kabaddi	11	18.3	3	5
Skipping	-	-	5	8.3
Chess	1	1.6	-	-
B. Activity				
Cycling	43	71.6	40	66.6
Walking	14	23.3	18	30
Watching TV	54	90	57	95
Networking	25	41.6	30	50

4. Haemoglobin level of the subjects.

Table 4 describes that Haemoglobin level of 46.6 percent subjects from the private school and 33.3 percent subjects from the government school have between 10-12g/dl followed by 20 percent subjects from private school and 26.6 percent subjects from government school of the range 8-10g.dl, 33.3 percent and 20 percent subjects from private and government school within the range of 12-16g/dl and 20 percent subjects from government school in the range of 6-8g/dl.

The table inferred that the haemoglobin level of private school adolescent were better than the government school adolescent. The adolescent in the Haemoglobin range of 6-8g/dl were from government school only and were also suffering from diseases like pain and sensation in legs, pale eyes and anaemia.

Table No. 4. Haemoglobin level of subjects.

Particulars	**Subjects**	
	Government school	**Private school**
	Percentage	**Percentage**
A. Haemoglobin		
6-8g/dl	20	0

8-10g/dl	26.6	20
10-12g/dl	33.3	46.6
12-16g/dl	20	33.3

Energy expenditure in physical activity by the subjects

Table 3 showed that the energy expenditure mean±sd of government school adolescents were more than that of the private school adolescents. The government school subject's energy expenditure was 639.55±282.75 where as the private school subjects were 535.08±242.99.

Table No. 3. Energy expenditure in physical activity by the subjects (N=120)

Particulars	**Subjects (N=120)**					
	Government school (60)			**Private school(60)**		
	Mean±SD	**Max.**	**Min.**	**Mean±SD**	**Max.**	**Min.**
Energy Expenditure (kcal/Hr)	639.55± 282.75	1355.8	175.1	535.08± 242.99	1207.2	87

Difference between energy expenditure in physical activity by the subjects

Table 4 inferred that the Mean±SD (639.55±282.75) of total energy expenditure of government school student was more than the Mean±SD (535.08±242.99) of total energy expenditure of private school students.

Table No. 4. Difference between energy expenditure in physical activity by the subjects (N=120)

Parameters	Subjects (N=120)		
	Mean±SD (govt.)	Mean±SD (pvt.)	Difference(t-test)
Energy Expenditure(kcal/Hr)	639.55±282.75	535.08±242.99	2.17*

T-test was computed for the energy expenditure of government and private school adolescents. The difference was found significant. The government school adolescents were expending more energy than the private school adolescents. This may be due to the reason that private school adolescents were doing more sedentary work than the government school adolescents. The private school adolescents were giving more time in watching T.V., using networking sites and in their study while government school adolescents were giving more

time in physical activities and domestic work. This finding was supported by Ogcchi U.P (2012).

Summary and Conclusion

Adolescents experience dramatic physical growth and development during puberty, which in turn appreciably increases their requirements for energy, protein, and other vitamins and minerals. Though physical activity and gender did not show any significant relationship with Haemoglobin of the students rather overall energy expenditure by school adolescents was more in contrast to the Haemoglobin level which was better among private school students. Therefore this study suggests that the Haemoglobin measurement of large sample size and energy expenditure pattern by them should further be done.

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