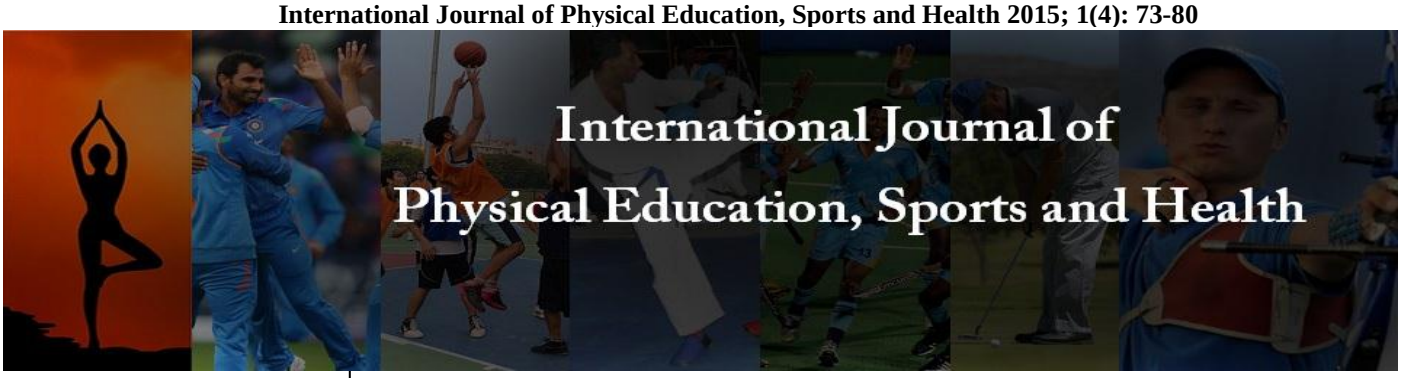

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A study of Correlations between growth and development of physical active children (5-8 years) with different race (Hindu, Muslim and Behari) of Haldia at Purba Midnapur in West Bengal

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Abstract
Longitudinal growth of an individual child is a dynamic statement of the general health of that child. Measurements should be performed often and accurately to detect alterations from physiologic growth. Somatic growth and maturation are influenced by several factors that act independently or in concert to modify an individual's genetic growth potential. Linear growth within the first 2 y of life generally decelerates but then remains relatively constant throughout childhood until the onset of the pubertal growth spurt. Because of the wide variation among individuals in the timing of the pubertal growth spurt, there is a wide range of physiologic variations in normal growth. Nutritional status and heavy exercise training are only 2 of the major influences on the linear growth of children. In the United States, nutritional deficits result from self-induced restriction of energy intake. That single factor, added to the marked energy expenditure of training and competition for some sports, and in concert with the self-selection of certain body types, makes it difficult to identify the individual factors responsible for the slow linear growth of some adolescent athletes, for example, those who partake in gymnastics, dance, or wrestling.
Thus, there is concern about the potential effects of training on the timing and progression (tempo) of puberty "caused" by participation in training and sports. Critical analysis with the biological indicators of bone age or peak height velocity in longitudinal study designs is required to tease out the effects of such training on pubertal development and adult height. Somatic growth and maturation are influenced by several factors that act independently or in concert to modify an individual's genetic potential. For example, at birth, an infant's size is more dependent on maternal nutrition and intrauterine and placental factors than on genetic makeup. The present study was therefore designed to characterize the growth and devlopment status and determine the race factor and physical activity that might be responsible for the physical development of children (5-8 years) in different race (Hindu, Muslim and Behari) of Haldia at Purba Midnapur in West Bengal.
For this study height, weight, MUAC, circumference skinfold measurement taken in physical active with different race, muslim Bengali and Bihari group of children.
In the present data it was noted that the weight, circumference, skinfold is significant changed in Muslim children compare to Bengali and Bihari group of children.

Keywords: height, weight, MUAC, circumference skinfold, race, physical activity.

1. Introduction
The period from 5-8 years is marked by vast development and the acquisition of skills. children learn to talk, run and become social beings (Malina *et al.*, 1970). This period is characterized by an exceptionally rapid rate of growth. The peak rates of growth are exceeded only during the fetal life and early infancy (Tanner, 1978). However, in comparison to infancy, there is much more individual variation in both the timing and in degree of growth. This has importance in terms of defining normality. Does physical activity, sport training, or both affect linear growth and pubertal maturation? The literature is replete with reports that the effects of athletic training on growth and pubertal development are salutary, deleterious, or nonexistent (Malina *et al.*, 1970). However, careful appraisal of these reports often reveals severe methodologic faults, such as lack of consideration of inter individual variation in biological maturity status and subject selection. Certain sports show advantages for the early maturer, especially for males, and others, especially gymnastics and dance, favor the later-developing female. Thus, there is concern about the potential effects of training on the timing and progression (tempo) of puberty "caused" by participation in training and sports. Critical analysis with the biological indicators of bone age or peak

Height velocity in longitudinal study designs is required to tease out the effects of such training on pubertal development and adult height. Somatic growth and maturation are influenced by several factors that act independently or in concert to modify an individual's

Genetic potential. For example, at birth, an infant's size is more dependent on maternal nutrition and intrauterine and placental factors than on genetic makeup. The correlation coefficient for adult height is only 0.25 at birth but is 0.80 by 2 y of age (, 1956).

The United Nations' Sub Committee on Nutrition meeting held in Oslo in 1998 concluded that more data on health and nutrition of school age children are needed to assess their scale of problem (ACC / SCN, 1998). It also believed that the scale of nutritional problems may have been previously under estimated. Traditionally, the main health indicator used by health planners has been mortality rates. Adolescents have the lowest mortality among the different age groups and have therefore received low priority. However, recent studies have shown that the prevalence of malnutrition and anaemia is high in the age group between 5-8 years.

Nutrition and physical activity may be defined as the science of food and its relationship to health. It has become apparent that lasting improvement in the health and nutritional status of people can be brought about only through a successful attack on the basic problems of poverty and injustice. The old concept that the health sector alone is responsible for all ills of the community has faded away. It is now realized that a broad intersectoral and integrated approach of sectors of development is needed to tackle today's nutritional problems and development of children (Park, 2002) [26].

Nutrition forms the most predominant influence on the development of the growing child (Joshi *et al.*, 2002) [18]. Encouraging pre-school children to eat a healthy, varied diet will provide all the nutrients they need for healthy growth and development and to establish good eating habits with physical activity for life. Children's energy requirements increase rapidly because they are growing quickly and becoming more active. They have a high energy requirement for their size. To achieve this energy intake, foods which are high in energy and rich in nutrients are very essential for this growing period. A good supply of protein, calcium, iron, and vitamins A and D are important during this time. Calcium is needed for health tooth development and, together with vitamin D, helps make bone stronger. Childhood is an important time for tooth and bone development. Small and frequent meals may be necessary for younger children, who do not have large enough stomachs to cope with big meals. During growth for an increase in each kilogram in body weight 30 mg of iron is required and since the increase in body weight during childhood is 2 kg / year on an average, the daily requirement of iron for growth will be 0.2 mg. To meet this

In general, boys who participate in sports have normal growth rates and are normal or advanced for their state of skeletal and sexual maturation (Malina *et al.*, 1970).

The present study was therefore designed to characterize the growth and development status and determine the racial, diet & nutrition factors and physical activity that might be responsible for the physical development of children (5-8 years) in different race (Hindu, Muslim and Behari) of Haldia at Purba Midnapur in West Bengal..

2. Methods and materials

The pattern of growth & the physical state of the body through genetically determined are profoundly influenced by diet & nutrition. Hence, anthropometric measurement are useful criteria for assessing nutritional status. It should be remembered that the other factors such as frequent illness due to infection or infestation may also affect the growth & physical status of the body.

The study was conducted on school going children of different race (Hindu, Muslim and Behari) group of (5-8 yrs). The total 75 no of subjects were collected from Haldia Purba Medinipur District of West Bengal, India by random sampling method and ware divided into three subgroups and in each group contains 25 no of children. To assess the nutritional status.

Anthropometric Assessment

Measurement of Height = >

Height is measured by the anthropometric rod. The subject were asked to remove the foot wear and stand with heads together and head positioned so that the line of vision was perpendicular to the body.

Measurement of body weight = >

Subjects stands on the platform of the human weighing machine exerting equal pressure on both feet the reading it taken from the scale with an accuracy of 0.5 kg.

Measurement of Head circumference = >

Head Circumference is related to mainly brain size and to a small extent, to the thickness of the scalp tissues & the skull. During the first year due to the rapid increase in the brain size, the head circumference normally reflects age rather than the health. But during the second year the brain size, the head circumference normally reflects age rather than tha health. But during the second year the brain size, the head circumference normally reflects age rather than the health. But during the second year the brain size and both the thickness of scalp vary with nutritional status & there by exhibiting variation in head circumference in the head circumference. In nutritionally anthropometry, the head / chest circumference ratio is of importance in detecting protein – calorie malnutrition during childhood. (Swaminathan M, 2006).

Instrument used = Flexible tape.

Procedure of Measurement = The tape is placed at the opisthocramion (most Posterior bulge of the head on the medial line) & supraorbital arches.

Measurement of chest Circumference = >

Head & chest circumferences are about same at 1 year of age. After this the skull grows slowly and the chest more rapidly. Therefore a chest / head circumference ratio less than are may be due to future of growth

During the measurement the subject stands erect, in a natural manner, with the feet at shoulder width. The arms are abducted slightly to permit passag3e of the tape around the chest when the tape is snugly in place the arms are lowered to their natural position at the sides of the trunk. (Swaminathan M, 2006)

Instrument used = Flexible tape.

Measurement of Mid Upper Arm Circumference (MUAC) = >

Measurement of the Circumference of the mid upper arm may prove to be a useful & practical means of assessing protein Calorie deficiency of early childhood. It can be serve as a index of nutritional status for screening in large population. It Provide an estimation of upper arm muscle & cross sectional muscle are an indicator of child muscle development.

(Worthington-Roberts, B. 1997)
Instrument used: Flexible tape.

Procedure of Measurement: These Circumferences is measured at the midpoint of left upper arm.

Measurement of waist Circumference and Hip Circumference = >
Instrument used: Flexible tape.
These Circumferences is measured at the point of Waist and Hip.

Measurement of skin fold = >

Despite practical difficulties in obtaining consistent results with skin fold calipers, these provide the only simple means of measuring subcutaneous fat & therefore, body composition. The importance of measuring body composition in relation to problems of nutrition is now becoming apparent. The best sites for skin fold measurements are debatable and may vary with the age group under consider ration. The balance of evidence at present favors measure over the triceps, biceps, chest, abdomen thigh and cuff as an index of nutritional status. (Worthington-Roberts, B. 1997)

3. Result

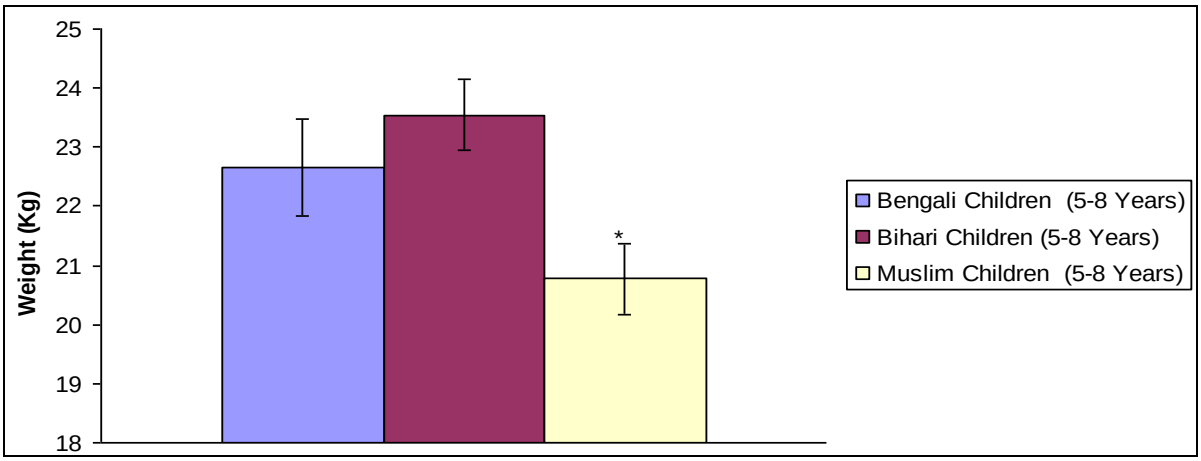

Fig 1: Weight (Kg) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2, 72) = 3.814 Behari vs Muslim * P=<0.05 (One-way ANOVA followed by Tukey test).

Table 1: Height (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Group	Height(cm)
Bengali children (n=25)	120.544 ±1.496
Bihari children (n=25)	119.40 ± 1.506
Muslim children (n=25)	117.4 ± 1.317

Value shows: Mean ± S.E

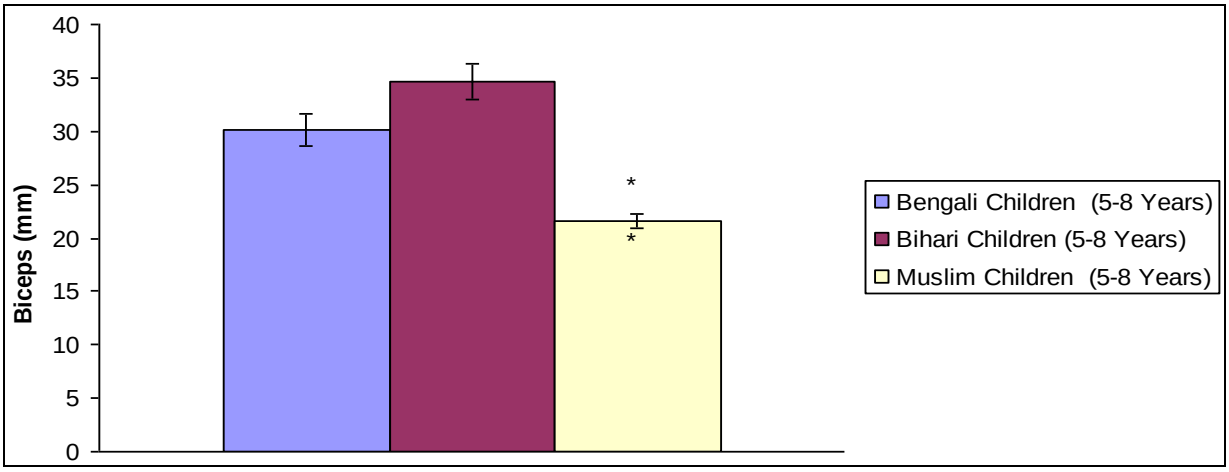

Fig 2: Skin fold of Biceps (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2, 72) = 21.515 Bengali vs Muslim *P =<0.001 Bihari vs Muslim *P =<0.001 (One-way ANOVA followed by Tukey test).

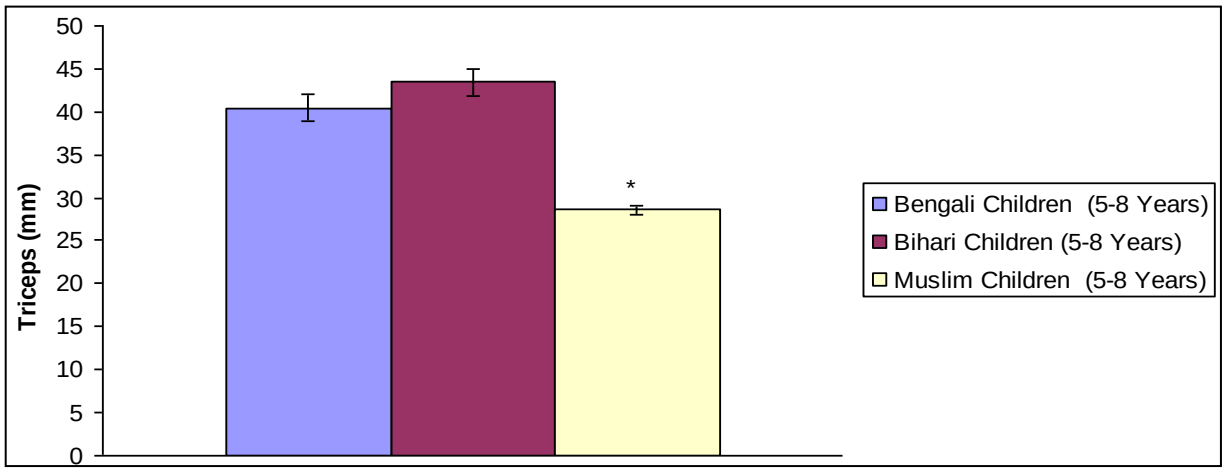

Fig 3: Skin fold of Triceps (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2, 72) = 33.292 Bengali vs Muslim *P =<0.001 Bihari vs Muslim *P =<0.001 (One-way ANOVA followed by Tukey test).

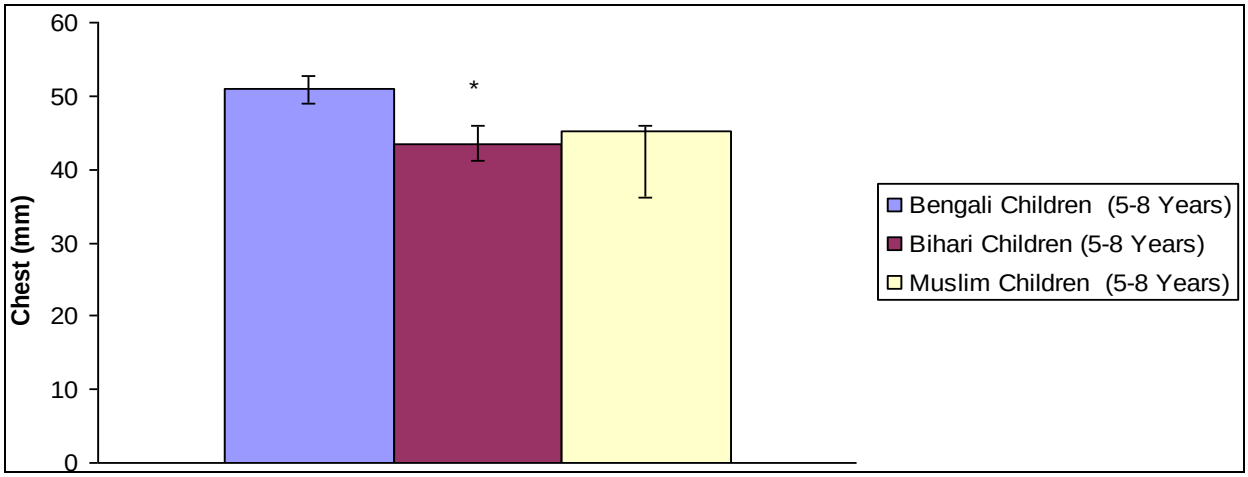

Fig 4: Skin fold of Chest (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2, 72) =3.872 Bengali vs Behari *P=<0.05 (One-way ANOVA followed by Tukey test).

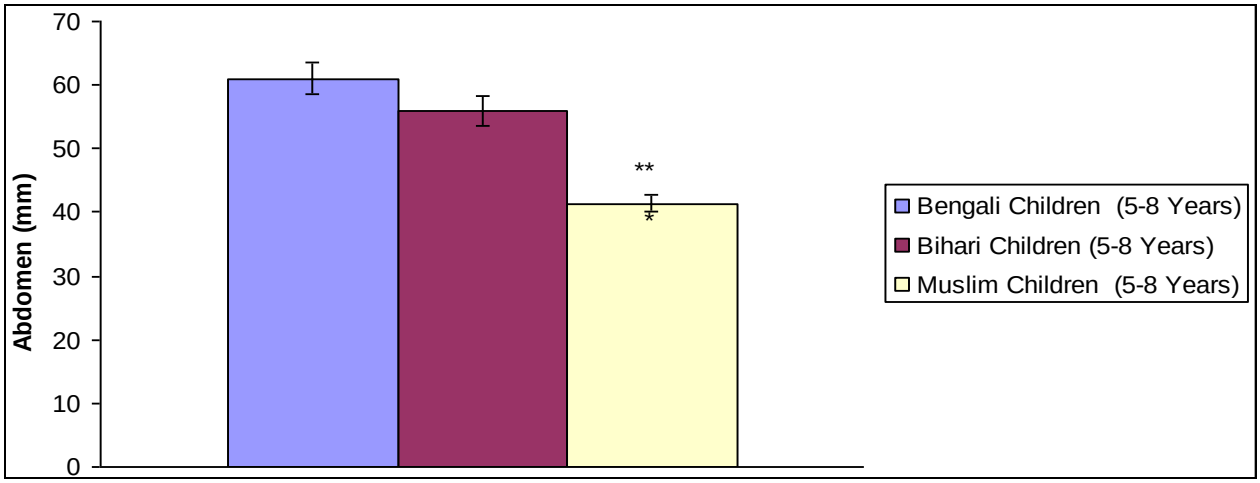

Fig 5: Skin fold of Abdomen (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2. 72) = 21.407 Bengali vs Muslim * P=<0.001 Behari vs Muslim*P=<0.001(One-way ANOVA followed by Tukey test).

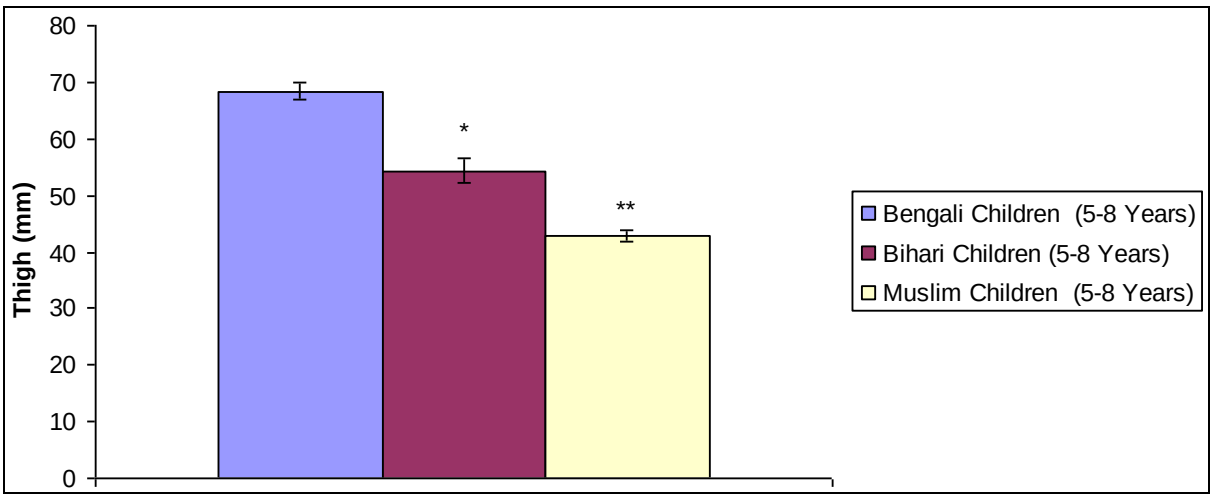

Fig 6: Skin fold of Thigh (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E

Significant at F (2. 72) = 57.790 Bengali vs Bihari *P=<0.001 Bengali vs Muslim *P=<0.001 Bihari vs Muslim *P=<0.001(One-way ANOVA followed by Tukey test).

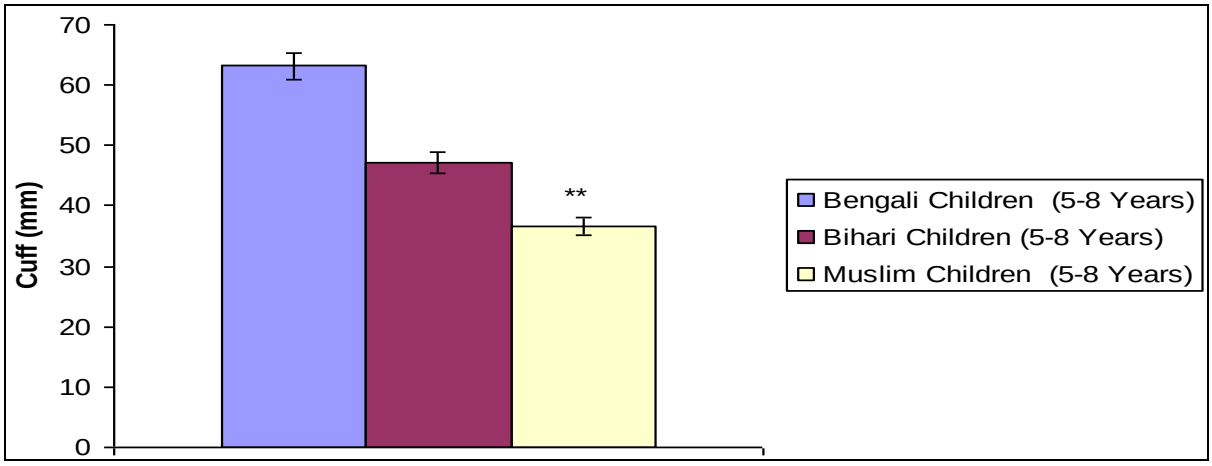

Fig 7: Skin fold of Cuff (mm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E

Significant at F (2, 72) = 19.928 Bengali vs Muslim*P=<0.001.Behari vs Muslim *P=<0.001 (One-way ANOVA followed by Tukey test).

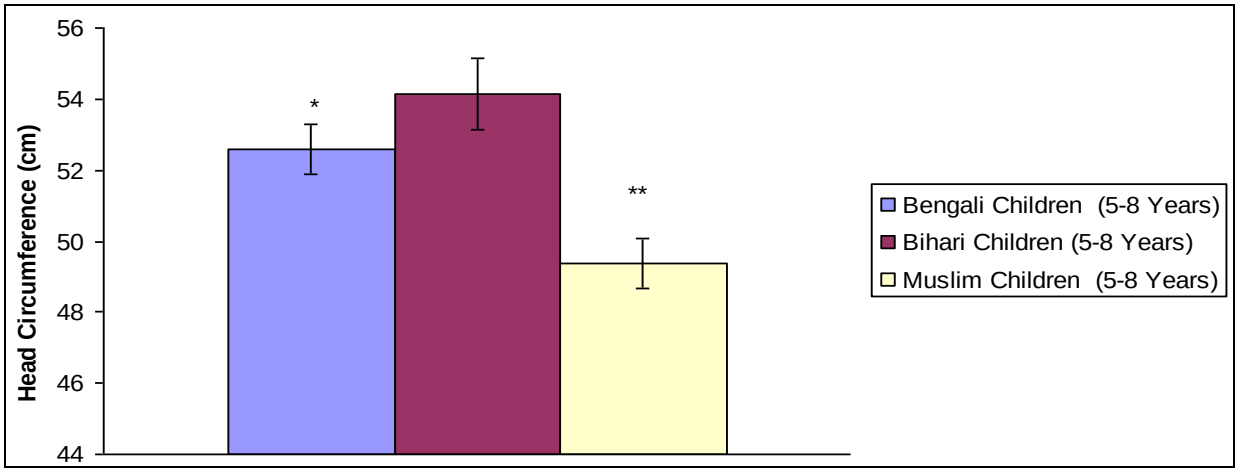

Fig 8: Head circumference (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E

Significant at F (2.72) = 8.069 Bengali vs Muslim *P=<0.05 Behari vs Muslim **P=<0.001 (One-way ANOVA followed by Tukey test).

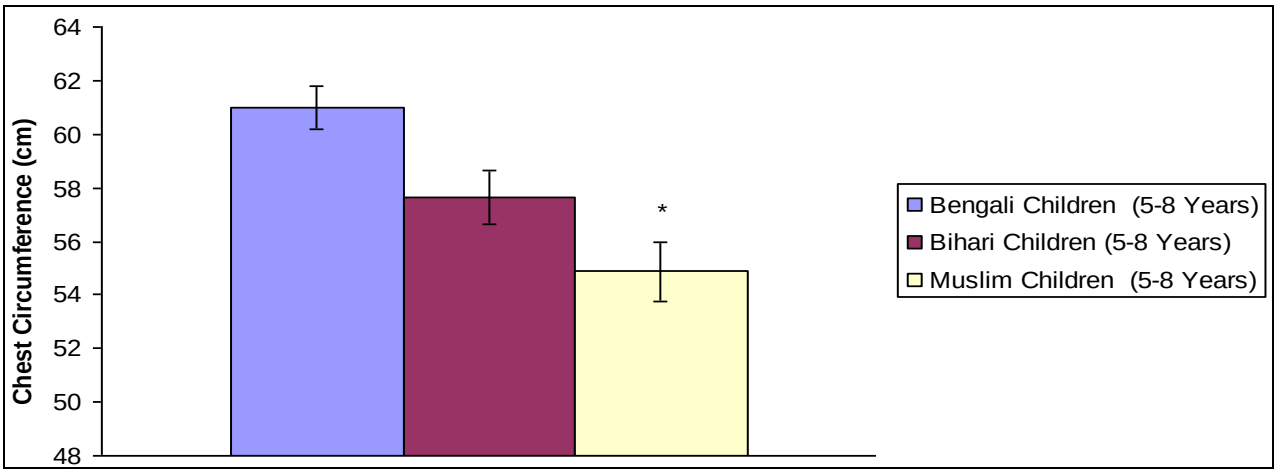

Fig 9: Chest circumference (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2.72) = 8.888 Bengali vs Muslim *P=<0.001(One-way ANOVA followed by Tukey test).

Table 2: Mid upper aim circumference (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Group	Mid upper aim circumference(cm)
Bengali children (n=25)	19.6±0.379
Behari children (n=25)	20.52±0.713
Muslim children (n=25)	18.92±0.370

Value shows: Mean ± S.E
(One-way ANOVA followed by Tukey test).

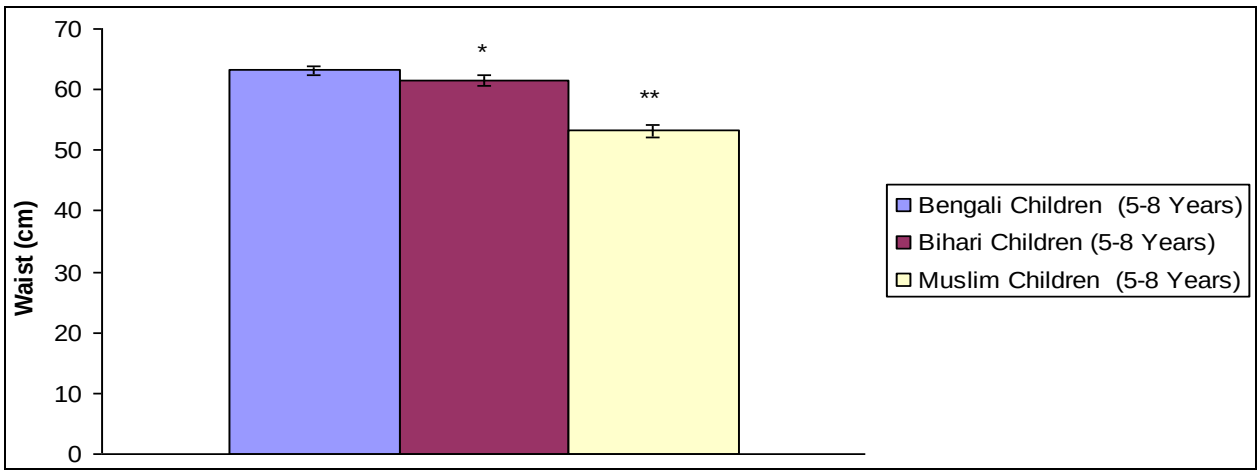

Fig 10: Waist circumference (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2.72) = 30.736 Bengali vs Muslim *P=<0.001 Behari vs Muslim *P=<0.001(One-way ANOVA followed by Tukey test).

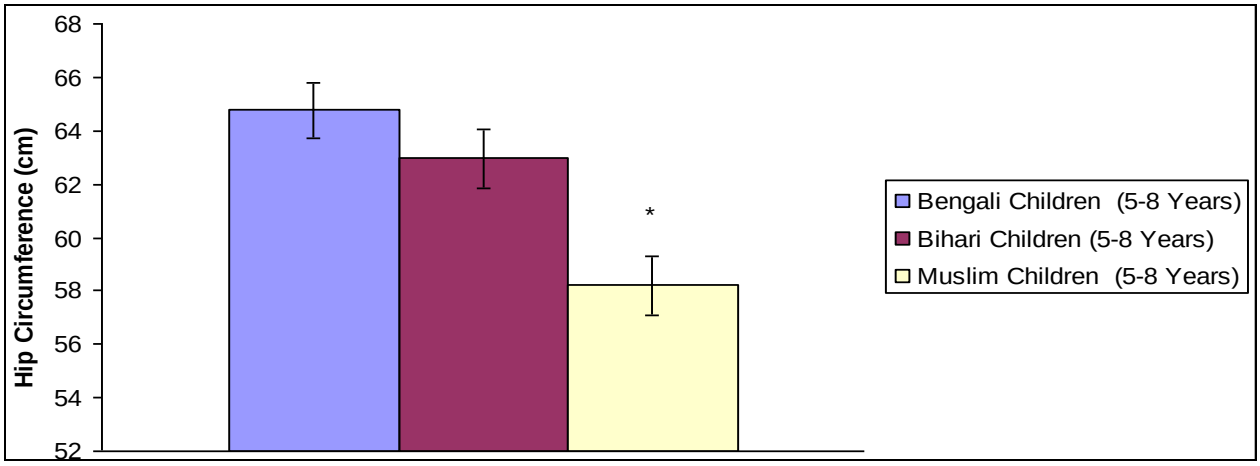

Table 11: Hip circumference (cm) of (5-8 years) Bengali, Bihari and Muslim children.

Value shows: Mean ± S.E
Significant at F (2.72) = 4.669 Bengali vs Muslim *P=<0.05 (One-way ANOVA followed by Tukey test)

4. Discussion

School going Children constitute the most vulnerable segment of the community. Their nutritional status is a sensitive indicator of community health and nutrition. (Gomez, F., Galvan, R. R., Frenk, S., Munoz, J. C.) A high proportion of developing country suffer from a number of micronutrient deficiency, besides the problem of protein energy malnutrition as manifested by underweight and stunting. In the Asia and Pacific region, commonly reported micronutrient problems involving children iron deficiency anaemia, vitamin A deficiency and iodine deficiency disorder. (Swaminathan M,)

Under nutrition including the "hidden hunger" problem of micronutrient deficiency is the largest risk factor in the world for disability and premature mortality especially in Developing country. Under nutrition is entirely preventable and its elimination would reduce child mortality by more than 50% and decrease the burden of diseases in developing countries by about 20% (Swaminathan M,).

Under nutrition occurs during periods of vulnerability such as during pregnancy and infancy and hence, the main victims are woman and young children. Poor nutrition during intrauterine life and the early years leads to profound developmental concequency.

Food habit of the population of this area is greatly determined by their purchasing power. The diet consumed by the population is based on cereals which constitute the main bulk of food. Rice and puffed rice are the cereals which are consumed everyday by all people of this locality. They occasionally consumed wheat, flaked rice, suji etc. In case of pulses, lentil is the first choice; but they also consume.

To improve the nutritional system the shortage of appropriately skilled personnel is a major constraint. Interviews at training centers and universities showed that, with some notable exceptions, social, economic and food sciences are poorly represented amongst academic staff. Funding bodies must provide incentives to re-orientate research to more programme-relevant topics, such as ways to increase the scale of effective nutrition interventions. Better leadership from academic journals would support this; editors of academic journals should meet in 2008 to develop a strategy to increase the profile and relevance of nutrition research. To improve in these four areas, individual organisations and the system as a whole must examine their strategies, resources and motivations. Organisations must significantly improve their links with national level processes, so that country level priorities are better reflected in international guidance, donor funding, research and training.

Thus, there is concern about the potential effects of training on the timing and progression (tempo) of puberty "caused" by participation in training and sports. Critical analysis with the biological indicators of bone age or peak height velocity in longitudinal study designs is required to tease out the effects of such training on pubertal development and adult height. Somatic growth and maturation are influenced by several factors that act independently or in concert to modify an individual's genetic potential. For example, at birth, an infant's size is more dependent on maternal nutrition and intrauterine and placental factors than on genetic makeup.

5. Summary and Conclusion

Under nutrition is common leading to nutritional deficiency diseases such as goiter, xerophthalmia. Under nutrition is the most common form of malnutrition among the low socioeconomic population in both Developed and Developing Countries. Under nutrition is also the primary cause of specific nutrient deficiencies that can result in muscle wasting, blindness, scurvy, pellagra, anemia, rickets etc.

Under nutrition remains a public health problem in Developing Country. The consequences of malnutrition represent a global problem, which effects morbidity as well as mortality. To manage this problem home based diet therapy is an effective method. A high energy, protein dense food can manage rehabilitee nutritional status of children. To control of infections the mother should be told what measures to take in event of fever, diarrhea and respiratory infections. A point should be made of stressing to family the value of general hygiene measure to improve the environment.

The international nutrition system develops international legislation and provides guidance to national nutrition groups. However, this is often inconsistent, not prioritised and impractical. For example, the guidelines produced by different organizations on how to address micronutrient deficiencies offer conflicting evidence about the effectiveness of different approaches. International organisations must work together to create simple, consistent and prioritised guidance. This should be based on evidence from impact evaluations of past projects

and programmes, and careful analysis of the implications for nutrition of major global changes, such as climate change and rising energy prices.

In the data it was noted that the height, weight, MUAC, circumference, Skin fold is significant changed in Muslim children compare to Bengali and Bihari group of children.

The evidence presented in this paper clearly supports the importance of nutritional status-as measured by weight, height, MUAC, BMI, circumference and Skin fold and physiological status is correlate with the genetic makeup in different class.

From the above study it may be concluded that all thre groups are physical active but they were in different genetic makeup as well as Food habit, and it was clearly reflect in this study. It may be due to Thayer different Food habit. Maybe Bengali group in take more protein, Carbohydrate than the Bihari and Muslim group. On the other hand Fat intake is higher in Behari group of children. So from the above works it was noted that the Nutritional status is lower in Muslim group of children and Thayer genetic makeup also make an important role for Thayer growth and development than Bengali and Bihari group of children.

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