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RESEARCH ARTICLE

COMPARATIVE STUDY ON ANTHROPOMETRIC AND NUTRITIONAL STATUS OF HIGH AND LOW SOCIO-ECONOMIC GROUPS OF PRESCHOOL CHILDREN

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ABSTRACT

To assess the anthropometric and nutritional status, to compared the relationship between socioeconomic statuses (SES) of preschool children (4-5 years) of West Bengal. A cross sectional survey was carried out among 200 preschool children in Paschim Medinipur district. Anthropometric measurement like height, weight, mid arm circumference, chest circumference and head circumference and following anthropometric indicator like Gomez classification and Water low's classification were measured of preschool children. Dietary nutritional status was assessed following standard method. From this present study, it has been found that the weights of the boys and girls of high socio-economic status are significantly higher than the weights of boys and girls of low socio-economic status but height is remain unaltered between two groups. The results found that mid-arm circumference and chest circumference are significantly varied among boys and head circumference is also significantly differ among girls belonging to high and low socioeconomic status of preschool children. On the other hand, the Gomez classification and Water lows classification are significantly lower in both boys and girls belonging to low socioeconomic groups. The results reveal that preschool children belonging to high socioeconomic status consumed significantly higher amount of dietary nutrient compared to low socioeconomic status. The present study shows that nutrient intakes were lower among preschool children with low socioeconomic status in both sexes. Thus, mean anthropometric characteristics was lower in this group. Consequently, much more emphasis is needed to be given to increase the nutrient of their diets especially among preschool children belonging to low socioeconomic groups.

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INTRODUCTION

The period from 1-6 years is marked by vast development and the acquisition of skills. Children learn to talk, run and become social beings (Kathleen and Betty, 2004). 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). It is now realized that a broad intersectional and integrated approach of sectors of development is needed to tackle today's nutritional problems (Park, 2011). Nutrition forms the most predominant influence on the development of the growing child (Joshi and Attlee, 2003). Nutrition status is the condition of health of an individual as influenced by the utilization of nutrients especially among pre-school children. Maternal malnutrition, low birth weight (LBW) and recurrent infection are other important factors lead to malnutrition (Mahtab *et al*., 2003). Malnutrition is the term which is closely related with nutrition and it is an impairment of health resulting from deficiency, excess or imbalance of nutrients. Surveys carried out by different workers in varies developing countries have shown that a large percentage of preschool children suffer from undernutrition and malnutrition (Wahab *et al*., 1993). In India it is highest among both scheduled castes and tribes (Elizabeth, 2004). Majority of the children in India who live below the poverty in an environment of multideprivation and starvation

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have physical and developmental retardation. It has been estimated that in India, 65% i.e. nearly so million children under 5 years of age suffer from varying degrees of malnutrition. Socio economic status is greatly co-related with malnutrition. In term of socio-demographic relationship, Agarwal *et al*., (1992) have notified that there was linear trained between nutritional status and monthly family income. In general, information on nutritional status among preschool children in different socio-economic status in India is lacking. There is a dearth of information relating to the anthropometric and nutritional status of Bengalee preschool children of West Bengal. In this context, the present study was conducted to investigate the anthropometric and nutritional status among preschool children in Paschim Medinipur District of West Bengal.

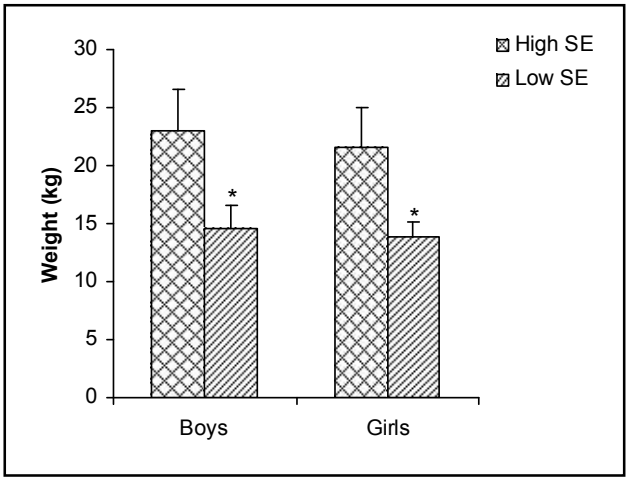
MATERIALS AND METHODS

This cross sectional study was carried out of rural preschool children (4-5 years) b in the district of Paschim Medinipur, West Bengal, India. A total of 200 preschool children, 100 were boys (high socioeconomic status = 50; low socioeconomic status = 50) and 100 were girls (high socioeconomic status = 50; low socioeconomic status = 50) measured and included in the present analysis. Subjects selected following simple random sampling method. Weight and height were measured by using weighing scale and anthropometric rod to the precision of 0.1kg and 0.1cm, respectively. All anthropometric measurement like head circumference, chest circumference and Mid-arm circumference was made and recorded following the standard methods described by Joshi (2002). On the other hand, Gomez classification and Water low's classification as an anthropometric indicator was measured according to the method described by Park (2011). In different angle like questionnaire, interview and recall methods were used to assess the dietary intake of the selected subjects and calculated with local food consumption tables according to the methods described by Joshi (2002). The data were expressed as mean ± standard deviation. Comparisons of the means of two groups were made by student t-test. A $P<0.05$ is considered as significance.

RESULTS

There were significant differences in weight among boys and girls between high and low socioeconomic statuses as follows in Figure-1 but there was no significant differences in height among boys and girls are presented in Figure-2. It was found that Mid-arm circumference (Figure-3) and Chest circumference (Figure-4) are significantly varied among boys and Head circumference (Figure-5) is also significantly differ among girls belonging to high and low socioeconomic status of preschool children. The anthropometric indicator like Gomez classification (Figure-6) and Water low's (Figure-7) classification are significantly lower among boys and girls belonging to low socioeconomic status of preschool children. The consumption of dietary protein, fat, carbohydrate and energy (Figure-8, 9, 10 & 11) among boys and girls are significantly lower among preschool children belonging to low socioeconomic group compared to high socioeconomic group of preschool children.

Fig.1. Weight of boys and girls of 4-5 years of high and low socio economic groups

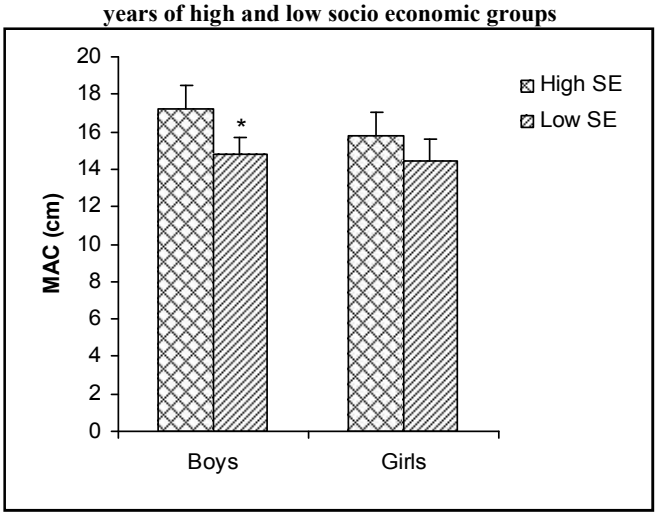


Data represents Mean ± SEM. * indicates significant difference ($P<0.05$) between two groups.

Fig.2. Height of boys and girls of 4-5 years of high and low socio economic groups

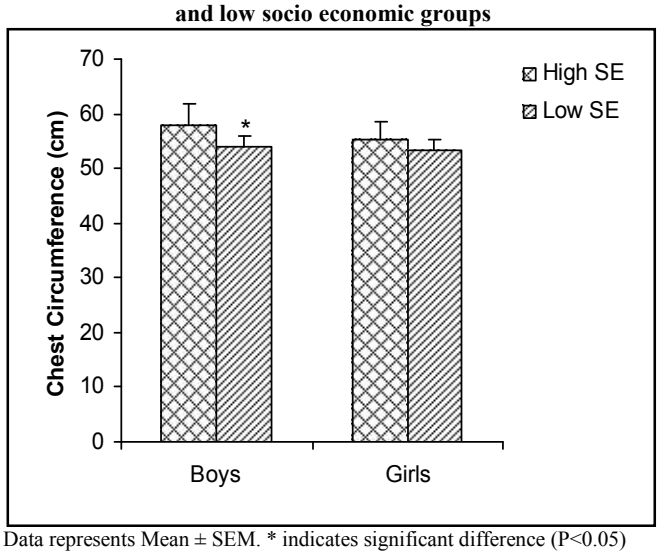
Data represents Mean ± SEM. * indicates significant difference ($P<0.05$) between two groups.

Fig.3. Mid-Arm Circumference (MAC) of boys and girls of 4-5 years of high and low socio economic groups



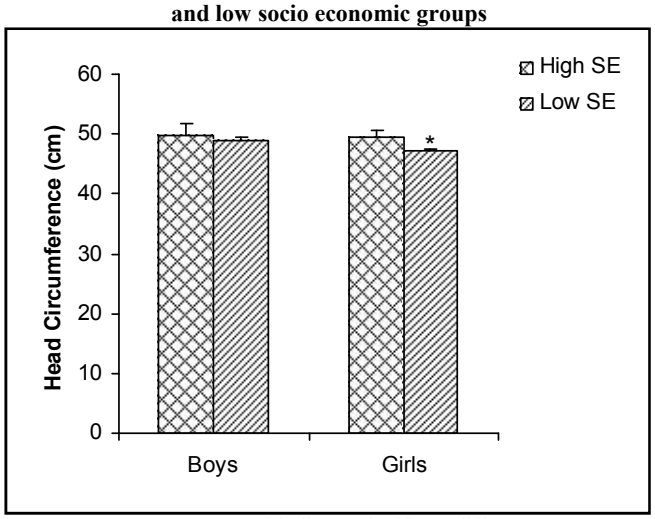
Data represents Mean ± SEM. * indicates significant difference ($P<0.05$) between two groups.

Fig.4. Chest Circumference of boys and girls of 4-5 years of high and low socio economic groups



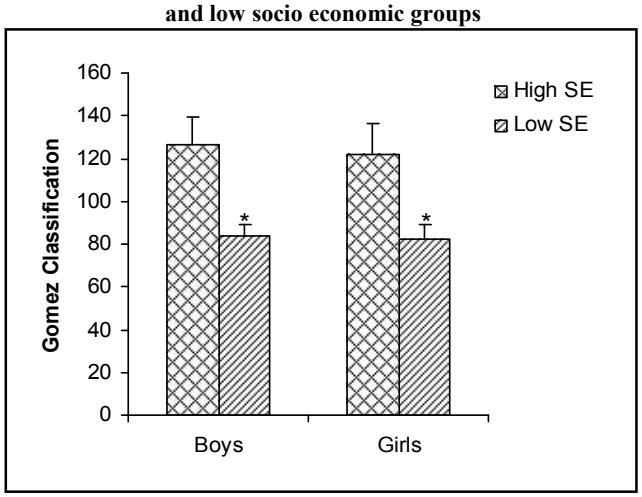
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.5. Head Circumference of boys and girls of 4-5 years of high and low socio economic groups



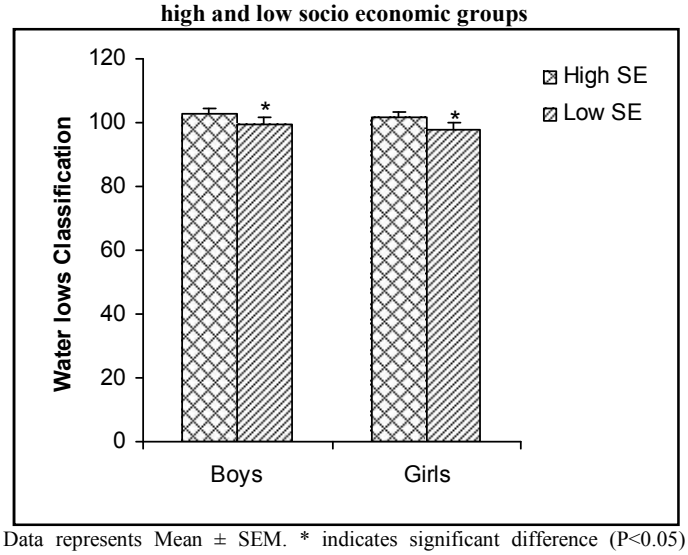
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.6. Gomez Classification of boys and girls of 4-5 years of high and low socio economic groups



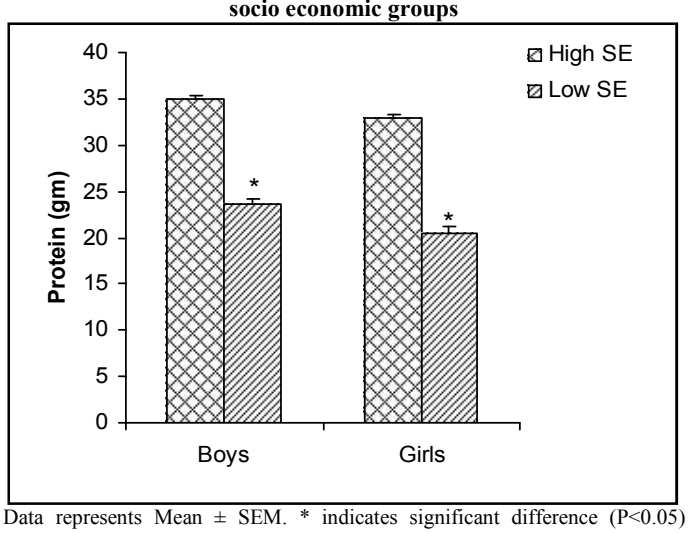
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.7. Water lows Classification of boys and girls of 4-5 years of high and low socio economic groups



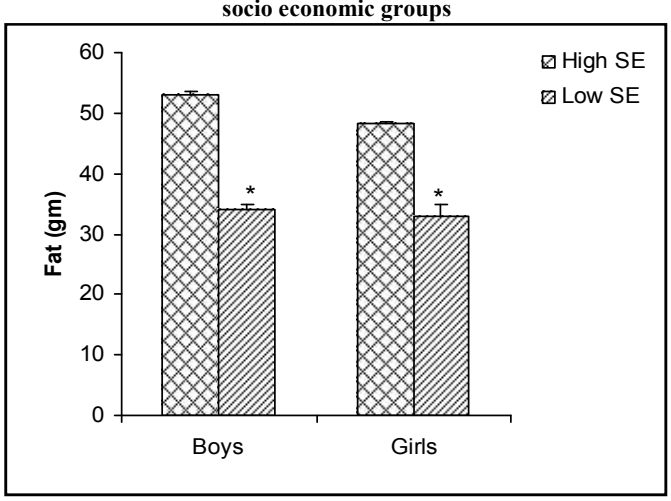
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.8. Protein intake of boys and girls of 4-5 years of high and low socio economic groups



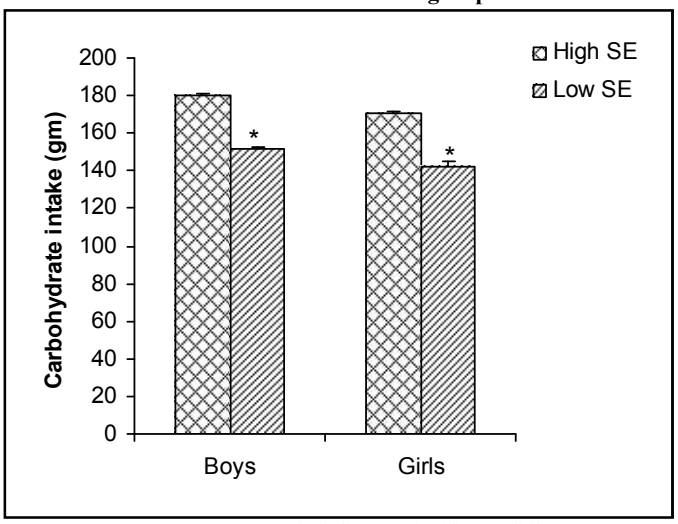
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.9. Fat intake of boys and girls of 4-5 years of high and low socio economic groups



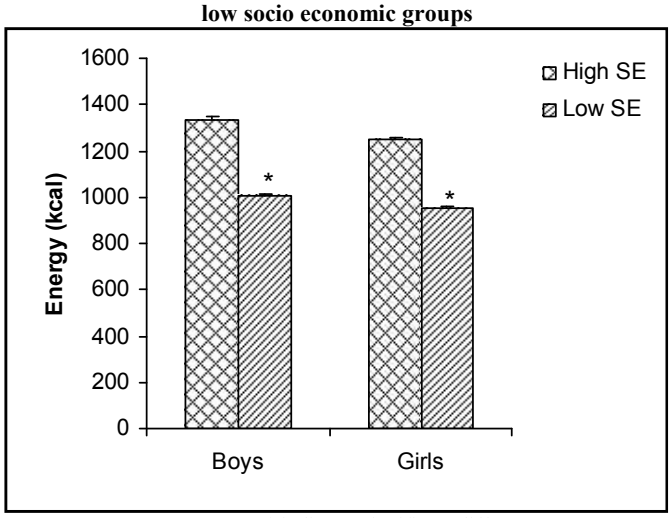
Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.10. Carbohydrate intake of boys and girls of 4-5 years of high and low socio economic groups



Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

Fig.11. Energy intake of boys and girls of 4-5 years of high and low socio economic groups



Data represents Mean ± SEM. * indicates significant difference (P<0.05) between two groups.

DISCUSSION

The present study demonstrate that the variation of nutritional support to the children (4-5 years) between low and high socioeconomic groups. The variations in the nutrient intake as well as the anthropometric measurements related to nutrition were measured in the two groups of economically supported preschool children. The foresaid study was carried out in between 4-5 years age children at Paschim Midnapore District, West Bengal. There are so many studies on nutritional support (ACC/SCN, 1998) but variation in nutritional support of preschool children between low and high socioeconomic group have been highlighted in a few studies. So there is a lack of extensive research work on this line. It was found that the variation in nutritional support, socioeconomic condition is divided in two groups according to Kuppuswami Scale (Elizabeth, 2004). Weight is an important indicator for the assessment of nutritional support (WHO, 1995). From this study, it was found that the weights of the boys and girls of high socioeconomic status are significantly higher than the boys and girls of low socio-economic status (Figure- 1). Weight gain or loss may be due to the consumption of the amount and quality of food, activity schedule, metabolic activity as well as normal physiological function that can easily helps to understand the growth rate of the child. In case of height, there is no significant difference between high and low socio-economic groups of 4-5 years boys and girls (Figure-2).

Mid-arm circumference (MAC), chest circumference and head circumference was measured between 4-5 years of preschool children in two socioeconomic groups (Figure-3, 4 & 5). The present study focused that the mid-arm circumference and chest circumference are significantly difference among boys between 4-5 years of preschool children in two economic groups but there is a significant variation of head circumference was observed among girls between two economic groups of preschool children. Malnutrition depends upon MAC value and thus it is also an important nutritional indicator for the study of nutritional status of children of different socioeconomic groups (Chhabra *et al*., 1996). Chest circumference and head circumference gives a clear picture on low nutritional status. In connection to other study, it can be indicate that lack of knowledge regarding nutritional and poor economic condition affect this under nutritional status of low economic group of children (Rao *et al*., 1984). So, from this study it has been stated that there is no severe malnutrition sign in low and high economic group in connection to another study. Brain size increases rapidly during the first year, when head circumference normally reflects age rather than health and nutrition (Raheela *et al*., 2002).

Gomez' classification and Water low's classification is a good nutritional anthropometric indicator for the pre-school children. It is based on weight retardation and it locates the child on the basis of his or her weight in comparison with a normal child of the same age (Park, 2011). In this present study, it has been found that Gomez' classification and Water low's classification are significantly lowered among low socioeconomic status of preschool children (Figure- 6 & 7). So this study depicts a clear image on nutritional anthropometry. Malnutrition with a low weight for a normal height, in which, the weight for height ratio is an indicative of an acute condition of rapid weight loss, or wasting (Agarwal *et al*., 1992).

The major nutrients like protein, fat, carbohydrate and energy are analyzed and found that all the major nutrients are better consumed by high socioeconomic group than low socioeconomic group of preschool children (Figure- 8,9,10 & 11). Nutrients are important for growth and development of children (Yadav and Singh, 1999). In connection to other study, it has been found that high socioeconomic groups of family are educated and more conscious about the health and nutrition of their children than others. So, they consumed specific and nutrient rich food according to demand (NNMB, 2002). It is assessed by anthropometric measurement because anthropometry is a simple and valuable tool and also the gold standard for evaluating the nutritional status (WHO, 1995).

From the present study, it may be indicated that the health status of low economic group is not up to the mark due to their lack of knowledge regarding food, nutrient and requirements of proper diet for their children. The socioeconomic situation of the family is one of the most important factors in child health. Insufficient food intake can cause malnutrition as well as other nutrient related health problem which will relapse in latter age. Children can develop skill if they are given the opportunity, public awareness and proper knowledge is the only way for overcoming this global problem.

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Conflict of Interest

The authors declare there are no con icts of interest.

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