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Prediction of height and weight of Delhi population: A kin anthropometric study

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Abstract
Accurate prediction of adult physical status plays an important role in guidance and in the choice of an appropriate game at an early age. This is very scientific and systematic approach and must be used in field of sport and physical education. In the present cross-sectional study of 389 boys were randomly selected ranging in age from 10 to 20 years. They belong to a genetic pool group of Delhi Jat boys (rural area), all residing in Delhi. At present two kin anthropometric variables i.e. weight and height were taken to predict the adult physical status. A ready reckoner was prepared as in table (1) to predict the weight and height of 10 and 11 years at as adult weight and height which is appropriate to this age of 10 and 11 years. For later age it is not advisable due to early or later growth spurt of the group later on. Height and weight are important essential parameters of sports physique in future. So this is the method not only to identify the talent, also to predict the certain parameters of sports at early age to use at adult age. It is good for sports performance that may be used by coaches and other experts in field of physical education and sports.

Keywords: Cross sectional, weight, height, prediction, adult status, sport, ready reckoner, observation

Introduction
Today, the role of sports science has extended very much in sports especially in identifying the talent at early age as forth coming champion at Olympic and other global level competitions. There are the ways not only to identify the talent, also to predict the certain parameters of sports. Accurate prediction of adult physical status plays an important role in guidance and in the choice of an appropriate game at an early age and may save much disappointment caused due to wrong selection of sport not in accordance with specific physical status (Kansal, 1981) [3]. The adult physical status of the children is largely dependent on heredity and hence, may be predicted from the body dimensions of the parents. However, such predictions involve quite errors due to various possible combinations of the large number of genes controlling the adult physical status (Tanner, 1951) [4-7]. The regularity of growth enables us to predict the adult measurements from the value of these measurements at young age (Tanner, 1962, 1978) [4-7].
The knowledge of both parents height allows the prediction of adult height of their children restricting the possibility of variation up to +-9 cm from the actual heights. However, the adult physical status has been shown to be more closely related to the values of the child himself. It has been reported that the (C.V) in case of most of the skeletal dimensions of the children with their respective adult measurements is quite high, about 0.8 at 2 years age and 0.9 at the age of 10 years (Tanner, 1974) [4-7]. Bayley (1946, 1962) [1, 2] initiated the publication of tables for the prediction of adult height from that of childhood and bone age.
Based on above cited literature, in present study, the predictions tables have been constructed to serve the Jat boys for the prediction value of weight and height from their respective ages from 10 to 11 years (table-1). The prediction of the adult status from the physical measurements of 12 onwards have not been worked out, as keeping in view the fact that an error is usually introduced in such predictions in the occurrence duration and intensity of adolescent growth spurts (Stolz and Stolz,1951; Tanner,1962; Wolansky,1967; Parizkova, 1975) [4-7, 8].

Methodology
This is a cross-sectional study of 389 boys ranging in age from 10 to 20 years who belong to a

genetic pool group of Delhi Jat boys (rural area), all residing in Delhi. Only two anthropometric variables i.e. weight and height were taken and healthy subjects, not suffering fem any type of disability, were included in the present study.

The population of Delhi includes higher percentage of Jat boys in rural area than that of other communities taken individually, therefore it was considered more benefitted to select Delhi Jat boys as the subject for the present study. Only Jat boys students belonging to 14 educational institutions from rural areas of North West district of Delhi were included in the present study. Maximum efforts were made to approximate random sampling as close as possible. The ages of the subjects were calculated up to three decimal places from the date of birth and date of examination by converting the days and months into the fractions of a year as illustrated by Tanner (1978) [4-7]. In this cross-sectional study, the data were grouped into eleven age groups (10 to 20 yrs) with an interval of one year between the successive groups.

The ready reckoner prepared as in table (1) to predict the weight and height of 10 and 11 years at as adult weight and height which is appropriate to this age of 10 and 11 years. For later age it is not advisable due to early or later growth spurt of the group later on.

Findings and Discussion

Table 1: Ready reckoner for the prediction of Delhi Jat boys of height and weight measurements that at the age of 10 & 11 years

Predicted adult height (cm)			Predicted adult weight (kg)		
Observed	**10**	**11**	**Observed**	**10**	**11**
120	150.09	145.56	22	47.74	44.77
122	152.59	147.98	23	49.91	46.77
124	155.09	150.41	24	52.08	48.48
126	157.59	152.83	25	54.25	50.88
128	160.10	155.26	26	56.42	52.92
130	162.60	157.69	27	58.59	54.95
132	165.10	160. 11	28	60.76	56.99
134	167.60	162.54	29	62.93	59.02
136	170.10	164.96	30	65.10	61.02
138	172.60	167.39	31	67.27	63.09
140	175.10	169.82	32	69.44	65.13
142	177.61	172.24	33	71.61	67.10
144	180.11	174.67	34	73.78	69.20
146	182.61	177.09	35	75.95	71.23
148	185.11	179.52	36	78.12	73.27
150	186.61	181.95	37	80.29	75.31
152	190.11	184.37	38	82.46	77.34
154	192.62	186.84	39	84.63	79.38
156	195.12	189.22	40	86.80	81.41
158	197.62	191.65	41	88.97	83.48
160	200.12	194.08	42	91.14	85.48

Table (1) shows that the ready reckoner is a normative illustation to estimate the height and weight against theory observed measurement. The table has been made by adopting the statistical tool with help of various calculations. That range of height is from 120 to 160 cm at early age and range of weight is from 20 to 42 kg of early age then there is prediction of adult status.

Table 2: Prediction of adult height and weight of two preadolescent Jat boys by using the ready reckoner developed in the present study

Subject table	Age	Measured height (cm)	Predicted height (cm) as per
A	10	138	172.60
B	11	138	167.39
Subject table	**Age**	**Measured weight (kg)**	**Predicted weight (kg) as per**
A	10	30	65.10
B	11	30	61.02

Prediction of adult physical status at age 10 & 11 years

Keeping in mind many other obvious utilities of adult status predictions, the ready reckoners have been developed for such predictions for Delhi Jat boys aged from 10 to 20 years based on the results obtained in the present study. Predictions of height and weight are possible with help of table (1) and user may predict on the basis of these table results. Above mentioned example is given for further illustration (table-2) for practical use. Suppose a boy aged 10 year weighs 30 kg and his height 138 cm., in case we want to predict his adult weight and height, we need simply to use table(1). The height of the child 138 cm is located in the column of measured height and the predicted adult height in the column predicted at age 10 is found against his observed height row (172.60 cm in the case). Similarly table (1) reveals about the adult weight of this child will be around 65.10 kg as read in the prediction at age 10 column against the observed weight of 30 kg. However if another boy has the same height and weight at age of 11 years, then it can be read from table (1) that his adult height and weight is expected to be 167.60 cm and 61.02 kg respectively.

So this is the method not only to identify the talent, also to predict the certain parameters of sports at early age to use at adult age that is good for sports performance that may be used by coaches and other experts in field of physical education and sports. Accurate prediction of adult physical status plays an important role in guidance and in the choice of an appropriate game at an early age. This is very scientific and

systematic approach and must be used in field of sport and physical education.

Discussion

It is very evident from table (1&2) in which ready reckoner is prepared to locate the adult status of a particular boy. This table may help to predict the adult status at age of 10 and 11 years. At this age, the choice of selection the professional sport begins for training. As example is given to understand how to locate the height or weight variable to predict that corresponding variable. Even, it is very simple to execute for Jat boys population. Even their guardian can use this method to satisfy themselves. To be successful in sports, parents satisfaction is essential for sustained participation in sports.

Height and weight are important essential parameters of sports physique in future. There are other parameters also required to improve the sports performance of sports persons. The calculation is done to make this on the certain statistical calculation. For other variables, the ready reckoner may be prepared like in present variables. It is to be cared that such prediction are advisable at age 10 and 11 years to avoid the errors due to early or later growth spurt.

Conclusion

Prediction of adult status helps to know the various characteristics required in sports. Sports performance is assumed to be based on certain body structure. Like the height and length of body limbs are required in team games and individual games. Even lower and upper extremities are to be seen as essential in individual and team games. The present study will helpful to understand the trend of growth of Delhi Jat boys. It will help the coaches and experts to train the population boys. This population is very much involved in sports. The players from this population represent at international and Olympic level very successfully. So this prediction will surely help to manage the sports talent at early age.

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