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Biology of the People of Jammu and Kashmir: I. The Growth Patterns and Physiological Variables of Various Population Groups of the State

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ABSTRACT The present paper deals with the growth patterns and physiological variable among various population groups of Jammu and Kashmir state, India. The study includes population groups from all the three main divisions of the state. They are Dogra Brahmans, Dogra Rajputs, Dogra Scheduled Castes and Gujjars from the Jammu region. From the Kashmir valley, Kashmiri Muslim adults were studied whilst the population groups from Ladakh include Bodhs, Baltis and Tibetans refugees. The subjects (N= 2,043) were studied for a set of 23 anthropometric and 3 physiological variables. The results of the study show that various Dogra groups have better growth rates and higher values of physiological variables as compared to their peers. In general it has been observed that the physical growth status of various population groups is proxy indicator of their economic prosperity and nutritional intakes. As reported elsewhere in the literature, high altitude population groups of Ladakh region show higher values of various chest measurements and lung functions owing to hypoxia.

INTRODUCTION

It has been proved by extensive research that physical status of human being is an outcome of the interaction of genetical and environmental factors. Whilst genetic factors are hereditary, some of the environmental factors are manipulative and are direct outcome of the socio-economic status of individual. The environmental factors include physical environment like altitude, climate, geographical zone and others, nutritional regime and quality of environment among others. All these factors have a very strong bearing on the health status of individuals.

Populations living at high altitude have been a source of extensive research for physical anthropologists (Monge 1948) even before International Biological Programme (Eveleth and Tanner, 1966). Since then numerous attempts have been made all over the world to document unique growth patterns and physiological functions of people living at the high altitude. The pioneer among them are the studies by Clegg et al. (1970, 1972), Baker (1969) and Hoff (1972).

There have been numerous attempts to document the growth patterns of populations groups inhabiting the Himalayan range. Among the earlier studies were on military personnel occupying Ladakh zone of Jammu and Kashmir and Tibetans settled in Nepal (Singh and Bhardwaj, 1969, Bhardwaj and Malhotra, 1970; Pawson, 1978). This was followed by studies of Singh, I. P. and Malik (1977), Singh, S.P. (1978), Singh, I.P. and Bhasin (1983) but these were scattered studies done on one particular population group and one particular aspect of the population groups occupying one or the other zone of Himalayas.

A project to study man-environment interaction in the state of Jammu and Kashmir was launched in 1987 under the MAB Programme of UNESCO. The aim of the study was to document the impact of environment on human being living in the zones. This project has special emphasis on Ladakh region, almost unknown to the outside scientific world, as there were few reports and studies on the population groups living there. The project undertook a series of studies on the growth patterns of the population groups living in the region. Some of these have been reported in the literature (Bhasin and Singh, 1991, 1992 a,b,c, Singh, 1991). These papers report on two major population groups of the Ladakh region i.e. Bodhs and Baltis, while Bhasin and Singh (1992 d,e) report on two smaller but unique population groups; Bodhs living in Changthang area and Dards occupying the Batalic region of Ladakh. The Baltis, Dards and Bodhs of Changthang were reported for the first time in literature (Bhasin and Singh, 1992 d, e).

The aim of this paper is to document growth patterns and physiological parameters of the population groups living in the area.

MATERIAL AND METHODS

The subject for the present study were drawn from all three regions of the Jammu and Kashmir state: Ladakh, Kashmir and Jammu. The inner Himalayan zone of Ladakh has two major population groups. The Bodhs mainly occupy Leh district of Ladakh division whereas the Baltis, a Shia Muslim group, are in majority in the Kargil district of the state, though both these districts have significant population of each community. The other population groups from the region include Tibetans, a group of refugees from Tibet living in and around Leh town of Ladakh and two groups of special interest Dards of Batalic and Bodhs of the Chanthang.

The Middle Himalayan zone, the Kashmir valley, is mainly occupied by two endogamous population groups Kashmiri Muslims and Kashmiri Brahmans. Due to ongoing civic unrest, it was not possible to collect extensive information on growth patterns of these two population groups. However a smaller sample of Kashmiri Muslim adults was studied from the region.

The outer Himalayan zone, Jammu, the Dogra land, was studied extensively, All the major population groups of the region go under the generic name of *Dogra.* However there are three distinct endogamous groups living in the region. They include Brahmans, Rajputs, and Scheduled Castes. All these groups were studied in detail for various anthropometric and physiological measurements. There are also two groups of special interest in the regions Gujjars and Bakarwals. They both are transhumant groups who migrate from Jammu region to the Kashmir valley and the Ladakh region during summer. We were able to collect information on Gujjars from the region (Table 1). For details about various population groups of the State see Bhasin and Nag (2002).

The subjects included in the study were male children and adults ranging from 8+ years to 18+ years. All those adult subjects aged more than 19 years were grouped as '19+ years and above'. All the subjects included in the study were selected at random from various schools, colleges and from the households by door to door visits. The subjects were apparently healthy though no physical examination of any kind was carried, none of the subjects had any physical deformity or was suffering from any long term physical ailment. Table 2 describes the number of subjects studied from each age group.

In order to get a comprehensive picture of growth and physiological pattern, it was decided to undertake the following measurements.

- Body Weight

Projective Height Measurements

- Height Vertex
- Sitting Height

Diameter

- Biacromial Diameter
- Bicristal diameter
- Transverse diameter of chest
- Antero posterior diameter of chest
- Humerus Bicondylar Diameter
- Femur Bicondylar Diameter
- Wrist Diameter
- Ankle Diameter

Circumferences

- Chest Circumference Inspired
- Chest circumference normal
- Chest circumference expired
- Mid upper arm circumference Relaxed
- Mid upper arm circumference Contracted
- Calf Girth

Skinfolds

- Biceps Skinfold
- Triceps skinfold
- Subscapular skinfold
- Suprailiac skinfold
- Calf skinfold
- Forearm skinfold

The following Respiratory functions were also studied:

- Forced Vital Capacity
- Forced Expiratory Volume (in one second)
- Peak Expiratory Flow

Based on the above anthropometric and physiological measurements, the following indices and other morphological measures have also been derived. The indirect anthropometric

Table 1: Profile of people of Jammu and Kashmir, India

S. No.	*Population groups*	*Region/Area*	*District*	*Ethnic groups*	*Occupations*	*Religion*	*Linguistic groups*
A. Ladakh Division							
1.	Bodhs	Inner Himalayan region	Leh	Scheduled Tribe	Agriculture	Buddhism	Tibeto-Chinese
2.	Tihetans	Inner Himalayan region	Leh	Scheduled Tribe	Agriculture	Buddhism	Tibeto-Chinese
3.	Baltis	Inner Himalayan region	Kargil	Scheduled Tribe	Agriculture	Islam	Tibeto-Chinese
4.	Bodhs of Changthang	Inner Himalayan region	Leh	Scheduled Tribe	Agriculture	Buddhism	Tibeto-Chinese
5.	Dards (Dogpas)	Inner Himalayan region	Leh	Scheduled Tribe	Agriculture	Buddhism	Indo-European
B. Kashmir Division							
6.	Kashmiri Muslims	Middle Himalayan region	Srinagar	Community	Agriculture/Horticulture	Islam	Indo-European
7.	Kashmiri Pandits	Middle Himalayan region	Jammu	Scheduled Caste	Priest/ Service	Hindusim	Indo-European
C. Jammu Division							
8.	Gujjars	Outer Himalayan region	Jammu	Scheduled Tribe	Animal/Husbandary	Islam	Indo-European
9.	Dogra-Brahmans	Outer Himalayan region	Jammu	Scheduled Caste	Priest/Agriculture	Hinduism	Indo-European
10.	Dogra-Rajputs	Outer Himalayan region	Jammu	Scheduled Caste	Services/Agriculture	Hinduism	Indo-European
11.	Dogra-Scheduled Castes	Outer Himalayan region	Jammu	Scheduled Caste	Artisan/Agriculture	Hinduism	Indo-European

Table 2: Age-wise distribution of sample for various population groups of Jammu and Kashmir State, India

Age (in years)	*Number*							
	Ladakh			*Kashmir Muslims*	*Jammu*			
	Bodhs	*Baltis*	*Tibetans*		*Gujjars*	*Dogra Brahmans*	*Dogra Rajputs*	*Dogra Scheduled Castes*
8+	35	37	12	-	-	21	24	22
9+	37	41	15	-	06	19	20	17
10+	41	38	11	-	09	20	27	33
11+	47	46	10	-	08	20	22	32
12+	52	44	10	-	14	23	21	22
13+	41	47	11	-	10	20	20	27
14+	43	51	07	-	09	21	22	25
15+	47	54	13	-	08	22	22	25
16+	43	46	20	-	10	20	20	21
17+	31	40	09	-	04	20	20	20
18+	33	36	05	-	06	20	18	18
19+ & Above	34	46	12	46	-	21	27	20

measurements included lower extremity length. The other measurements included percentage of body fat, total body surface area. The anthropometric measurements were taken following standard techniques as described in Singh and Bhasin (1989) and Weiner and Lourie (1969). All the anthropometric and physiological measurement were taken by a single investigator so as to minimise inter personal error, that invariably creeps in such a wider range of data and measurements. In addition to the above anthropometric and physiological measurements, anthropometric somatotype has been calcutated using Heath Carter Method (Heath and Carter, 1967; Carter, 1975; Carter and Heath, 1990)

The data were analysed using PC version of SPSS at the computer centre of University of Delhi during 1989-91.

RESULTS

The results of the study are being reported in Table 3.

Body Weight

Body weight is measurement of overall growth status of the person at the time of study. A look at the range of body weight shows that at age group 8+ years, Tibetans of Ladakh are the heaviest among all children, very closely followed by Dogra Rajputs, Baltis and Bodhs. At age group 8+ years, Dogra Scheduled Castes are the lightest of all the age groups. In almost all the population groups, there is an increase in the body weight with each passing year. At age group 18+ years, Dogra Rajputs are the most heavy among their peers, closely followed by the other two Dogra groups, Scheduled Castes and Brahmans. Among population of Ladakh region, Bodhs are heavier than the Baltis. The other two population groups, Gujjars and Tibetans end up lighter than the other population groups.

A look at the weight trends of adults of the Jammu and Kashmir state shows that the Kashmiri Muslims were the heaviest of all groups, followed by Gujjars, Dogra Rajputs, Dogra Brahmans, and there was no significant differences in weight of the Dogra Scheduled Castes, Bodhs, Baltis and Tibetan of Ladakh region, who continue to be lighter than the other groups.

Height Vertex

As in the case of body weight, in height vertex also, Dogra Rajputs are tallest at age group 8+ years, very closely followed by Tibetans and Dogra Brahmans and Scheduled Castes in the order given. Ladakhi Bodhs and Baltis are among the shortest at the age group 8+ years. Again as in the case of weight, all the age groups continue to gain height throughout the period under study. At the age group 18+ years, Dogra Brahmans are the tallest among their peers of the state. They are followed by the other two Dogra groups and Gujjars. Among various Ladakhi groups, the Baltis are slightly taller than the Bodhs, who are followed by the Tibetans.

Among adults, Kashmiri Muslims are the tallest group, followed by various Dogra groups and Gujjars. Among Ladakhi groups, as in case of 18+ young adults, Baltis are the tallest groups, followed by Bodhs and Tibetans. As such all three Ladakhi groups are shorter than their peers.

Sitting Height

At the age group 8+ years, Tibetans have maximum sitting height and they are very closely followed by Dogra Scheduled Castes, Rajputs and Brahmans in the order. Ladakhi Bodhs and Baltis have lesser sitting height than their peers. As in any other projective height measurement, there is continuous increase till age group 18+ years. At the age group 18+ years, various Dogra groups take over their peers with Dogra Brahmans recording maximum sitting height, very closely followed by Dogra Rajput. Dogra Scheduled Caste. The Ladakhi Bodhs follow them with almost similar sitting height. Tibetans and Gujjars have lower sitting height than their peer groups at age group 18+ years.

In the case of adults, Kashmiri Muslims and Baltis have higher sitting height than their peer groups. They are closely followed by Ladakhi Bodhs and various Dogra groups. Tibetan and Gujjars, as in the case of young children, have lesser sitting height than their peers.

Diameters

Biacromial Diameter: At the age group 8+ years, Tibetans have largest Biacromial diameter, they are followed by various Dogra groups.

Among Dogras, Dogra Rajputs have largest biacromial diameter, followed by Dogra Brahmans and the Scheduled Castes in the order. Ladakhi Bodhs and Baltis have lesser biacromial diameter than their peer groups of the state. As with the other body measurement during these years, almost all the groups continue increase in biacromial diameter. At age group 18+ years, Dogra groups take over their peers. Among Dogras, Dogra Scheduled Castes have largest biacromial diameter, followed closely by Dogra Rajputs and Brahmans. The other groups like Ladakhi Bodhs and Baltis, Tibetans and Gujjars have almost similar biacromial diameters.

Among Adult groups of Jammu and Kashmir state, Dogra Rajputs and Kashmiri Muslims have higher biacromial diameter than their peer groups. These groups are followed by Dogra Brahmans whilst Dogra Scheduled Castes and Gujjars record similar biacromial diameter. Among three Ladakhi groups, who record less biacromial diameter than their peer groups, Tibetan have higher biacromial diameter than the Baltis and Ladakhi Bodhs.

Bicristal Diameter: Tibetan children have largest bicristal diameter at age group 8+ years compared to their other peers from the state. They are followed by various Dogra groups with Dogra Rajputs recording maximum bicristal diameter among the Dogra peers followed by Dogra Scheduled Castes and Brahmans. They are followed by Baltis. At age group 18+ years, Dogra Brahmans have largest bicristal diameter and they are closely followed by Dogra Scheduled Castes, Dogra Rajputs, Gujjars and Baltis. Ladakhi Bodhs and Tibetans follow these groups in order.

As far as adult population groups are concerned, Kashmiri Muslims have the largest bicristal diameter and they are followed by Tibetans, Dogra Brahmans, Dogra Scheduled Castes and Dogra Rajputs in order. Baltis and Ladakhi Bodhs follow these population groups in order.

Transverse Diameter of Chest: Chest diameters are important measurements in case of population living at the altitude. Since these population groups are often are associated with hypoxia-a physiological condition . Therefore both the chest diameters and three chest circumference, (relaxed, inspired and expired) were also studied.

At age group 8+ years, Tibetan have largest transverse chest diameter and they are followed by various Dogra groups. Among Dogras, Dogra Brahmans have the largest transverse chest diameter, they are followed by Dogra Scheduled Castes and Dogra Rajputs in the order. Both Baltis and Ladakhi Bodhs have lower transverse diameter of chest than their peers. As in the case of other anthropometric measurements, Dogra groups take over their peers in this measurement as well by the time these groups reach age group 18+. At 18+ Dogra Rajputs have largest transverse diameter of chest, they are closely followed by Dogra Brahmans, Gujjars and Dogra Scheduled Castes. Bodhs of Ladakh are followed by Tibetans who are, in turn followed by Baltis of Ladakh.

In the case of adults, Kashmiri Muslims have largest transverse diameter of chest they are closely followed by Tibetans and various Dogra groups. Bodhs, Baltis and Bodhs of Ladakh have lower transverse diameter of chest than their peers in the state.

Antero-posterior Diameter of Chest: At age group 8+ Tibetans have largest Antero posterior diameter of chest. They are followed by various Dogra groups, who are followed by Baltis and Bodhs of Ladakh. As in the case of other anthropometric measurements, antero posterior diameter of chest continue to increase till age group 18+. At 18+ Dogra Scheduled Caste record maximum antero posterior diameter of chest. They are followed by Tibetans, Dogra Rajputs, Bodhs of Ladakh, Dogra Brahmans and Baltis. In the case of adults Tibetans still have largest Antero posterior diameter of chest. They are followed by Kashmiri Muslims and various Dogra groups. Baltis and Bodhs of Ladakh have lower Antero posterior diameter of chest as compared to their peers from the state.

Humerus Bicondylar Diameter: At age group 8+ Dogra Brahmans have largest humerus bicondylar diameter followed by Dogra Rajputs and Tibetans, Dogra Scheduled Castes. Bodhs and Baltis of Ladakh have lower humerus bicondylar diameter than their peers. At age group 18+ various Dogra groups have larger humerus bi-condylar diameter than their peers. Among Dogras, Dogra Rajputs have largest humerus bi-condylar diameter followed by Dogra Brahmans and Dogra Scheduled Castes. Ladakh Bodhs have humerus bi-condylar diameter than the other Ladakhi groups. Gujjars have lower humerus bi-condylar diameter than Dogra groups but higher than various Ladakhi group.

Among adults Kashmiri Muslims and Gujjars have higher humerus bi-condylar diameter than their peers. They are followed by Dogra Brahmans, Rajputs various Ladakhi groups and the Dogra Scheduled Castes.

Femur Bi-condylar Diameter: Age group 8+, the Tibetans have greater femur bi-condylar diameter than their peers of the state. They are closely followed by various Dogra groups. Both Baltis and Bodhs of Ladakh have lower femur bi-condylar diameter than their peer groups of the state. As in the case of various other anthropometric measurements femur bi-condylar diameter continue to increase with age. At 18+ age group various Dogra groups have higher femur bi-condylar diameter then their peers. The other groups like Ladakhi Bodhs, Baltis, Tibetans and Gujjars have similar femur bi-condylar diameter but it is lower than the Dogra groups. Among adults Dogra Rajputs have largest femur bi-condylar diameter which is closely followed by Kashmiri Muslims, Dogra Brahmans and Ladakhi Bodhs. They are in turn followed by Baltis, Dogra Scheduled Castes and Tibetans.

Wrist Diameter: At age group 8+ Dogra Brahmans have broadest wrists, followed by Dogra Rajputs and Tibetans. They are in turn followed by Dogra Scheduled Castes, Bodhs and Baltis of Ladakh. Wrist Diameter continue to increase from age group 8+ to 18+ years. At age group 18+ the Gujjars have, broadest wrists followed by Dogra Brahamans, Rajputs and Bodhs. They are in turn followed by Tibetans and Baltis of Ladakh. Among adults Gujjars have widest wrists followed by Dogra Rajputs, Dogra Brahamans and Tibetans. They are in turn followed by Bodhs, Dogra Scheduled Castes and Balits of Ladakh.

Ankle Diameter*:* At age group 8+, Dogra Brahmans highest value of ankle diameter. They are followed by Tibetans, Dogra Scheduled Castes and Dogra Rajputs. Ladakhi population groups like Bodhs and Balits have lower values of ankle diameter at age group 8+. Ankle diameter continue to increase 8+ through 18+ years of age. At age group 18+ Gujjars have highest value of ankle diameter followed by Ladakhi groups in the order of Tibetans, Bodhs and Baltis. Dogra group have lower value of ankle diameter and the order is Dogra Brahmans, Dogra Rajputs and Dogra Rajputs. Among adults, Gujjars, Dogra Brahmans and Bodhs of Ladakh have almost similar values of ankle diameter and are ahead of their peer groups. They are followed by Dogra Rajputs, Baltis, Dogra Scheduled Castes, Kashmiri Muslims and Tibetans in the given order.

Chest Circumference Inspired: At age group 8+, Tibetans have the broadest chest circumference (when inspired), followed by their peer groups of Ladakh (Bodhs and Baltis). They are followed by the population groups of Jammu region. Like other anthropometric measurements, chest circumference (inspired) also continues to grow during the study period. At 18+ years, Dogra population groups and Gujjars record similar values of chest circumference. Ladakhi Bodhs, Tibetans and Baltis record similar values of the measurements, which are significantly lower than their Dogra peers.

Chest Circumference (Normal): At age group 8+ years Tibetans have highest value of chest circumference in the normal state. They are followed by other two Ladakhi groups in with Bodhs showing slightly higher values than Baltis. Dogra groups show almost similar values of chest circumference which are lower than their peer groups. At age group 18+ Dogra Scheduled Castes have highest values of chest circumference in the normal state. They are followed by Gujjars, Dogra Rajputs and Dogra Brahmans in the order. The Ladakhi groups have lower values of chest circumference than their peer groups. Among Ladakhis, Bodhs have the highest value, followed by Baltis and Tibetans. Among adults of Jammu and Kashmir, Kashmiri Muslims have highest value of chest circumference in the normal state. They are closely followed by various Ladakhi groups with the Tibetans showing highest value among them and they are followed by Bodhs and Baltis. Among the population groups of Jammu region - who in general have lower values of chest circumference then their Kashmiri and Ladakhi peers-Dogra Rajputs have highest value followed by Gujjars, Dogra Scheduled Castes and Dogra Brahamans in the order.

Chest Circumference (Expired): Tibetans have the highest value of chest circumference (expired) among the population groups of the state at age group 8+ years. They are followed by other two Ladakhi groups with the Bodhs showing slightly higher value than the Baltis. Dogra groups have higher values of chest circum-ference (expired) then their peer groups. Chest circumference (expired) continue to

increase age group 8+ through 18+ years. At 18+ Dogra Scheduled Castes have the highest value of chest circumference (expired) followed by Dogra Rajputs, Dogra Brahamans and Ladakhi Bodhs. They are in turn followed by Tibetans Baltis and Gujjars. Among adults Tibetans have the highest value of chest circumference (expired) followed by Kashmiri Muslims. They are in turn followed by Dogra Brahamans, Ladakhi Bodhs, Dogra Rajputs, Gujjars and Baltis.

Upper Arm Circumference (Relaxed): At age group 8+ Tibetans have highest value of upper arm circumference (relaxed). They are closely followed by Dogra Brahmans, Dogra Rajputs and Ladakhi Bodhs. They are in turn followed by Dogra Scheduled Castes and Baltis. As in the case of other body measurement upper arm circumference (relaxed) continues to increase from age group 8+ through 18+. At age group 18+ Dogra Rajputs have highest value of upper arm circumference (relaxed) among their peers. They are followed by Gujjars, Dogra Scheduled Castes. Dogra Brahmans and Ladakhi Bodhs have similar value of upper arm circumference (relaxed) and they are followed by Baltis and Tibetans in the order. Among adults of Jammu and Kashmir state Dogra Rajputs have the highest value of upper arm circumference (relaxed) among their peers they are followed by Gujjars and Kashmiri Muslims. They are in turn followed by Dogra Brahmans, Tibetans, Dogra Scheduled Castes and the two Ladakhi groups.

Upper Arm Circumference (Contracted): Tibetans have the highest value of upper arm circumference (contracted) at age group 8+ among their peers. They are followed by Dogra Brahmans, Ladakhi Bodhs, Dogra Rajputs and Dogra Scheduled Caste in the order. Upper arm circumference (contracted) continue to increase up to age group 18+ as in the case of most of the anthropometric measurements. At age group 18+ , Dogra Rajputs the highest value of upper arm circumference (contracted) followed by Gujjars, Dogra Scheduled Castes and Dogra Brahmans in the order. Various Ladakhi groups have lower value of upper arm circumference (contracted) than their peers with Ladakhi Bodhs showing higher value than the other two Ladakhi groups. Among adults also Dogra Rajputs and Gujjars have highest value of upper arm circumference (contracted) as compared to their peers of the state. They are followed by Dogra Brahmans, Kashmiri Muslims and Dogra Scheduled Castes in the order. Various Ladakhi groups have lower value of upper arm circumference (contracted) than their peers. However, among Ladakhis, Tibetans higher value of upper arm circumference (contracted) followed by Baltis and Bodhs.

Calf Girth: At age group 8+ Tibetans have the highest value of calf girth among their peers. They are followed by Dogra Brahmans, Ladakhi Bodhs and Dogra Rajputs in the order. They are in turn followed by Dogra Scheduled Castes and Baltis. As in the case of other circumference, calf girth also continues to grow up to age group 18+. At age group 18+ Dogra Rajputs have highest value of calf girth. They are followed by Dogra Scheduled Castes and Ladakhi Bodhs. They are in turn followed by Dogra Brahmans, Gujjars, Tibetans and Baltis in the given order. Among adults, Gujjars have the highest value of calf girth followed by Dogra Rajputs, Dogra Brahmans, Kashmiri Muslims and Dogra Scheduled Castes. Various Ladakhi groups have lower value of calf circumference as compared to their peers. However, among Ladakhi groups, Bodhs have slightly higher value of calf girth followed by Baltis and Tibetans.

Skinfolds

Biceps Skinfold (mm): At age group 8+ years, Tibetans have the highest value of biceps skinfolds and they are followed by various Dogra groups. Among Dogras groups, Dogra Rajputs have higher value of the skinfolds followed by Brahmans and Scheduled Castes. There is no particular trend though in general there is an increase in biceps skinfold. At age group 18+ years, various groups from Jammu region, Dogras and Gujjars have higher values of biceps skinfold as compared to various Ladakhi groups. Among adults also, various Dogra groups have higher value of biceps skinfolds compared to other groups. They are followed by Kashmiri Muslims and Tibetans. Two Ladakhi groups, of Bodhs and Baltis, have lower values of skinfolds as compared to their peers.

Triceps Skinfolds (mm): Triceps skinfold is highest among Tibetans children among their peer groups. They are followed by Ladakhi Bodhs and various Dogra groups. The Baltis of Ladakh have lowest value of triceps skinfolds. Though no particular trend is observed in the case of

triceps skinfolds, the values of the same increase by age. At 18+ years, Gujjars have the highest value of triceps skinfolds, followed by various Dogra and Ladakhi groups. Among adults of Jammu and Kashmir state, Dogra Rajputs have the highest value of triceps skinfold. They are followed by Dogra Brahmans, Tibetans, Kashmiri Muslims, Dogra Scheduled Castes, Ladakhi Bodhs and Baltis in the order.

Subscapular Skinfolds: As in the case of other skinfolds, Tibetan children have the highest value of subscapular skinfold at age group 8+ years. They are followed by various Dogra groups and they are in turn followed by Ladakhi Bodhs and Baltis. Though no trend is observed in the skinfold pattering, there is, in general, increase in subscapular skinfold among all the groups. At 18+ years, Dogra Scheduled Castes have the highest value of subscapular skinfolds, followed by Tibetans, Dogra Rajputs, Gujjars, Dogra Brahamns, Baltis and Bodhs. Among adult groups, Dogra Rajputs the highest value of Subscapular skinfolds, and they are followed by Kashmiri Muslims and Tibetan. They are in turn followed by Gujjars, Dogra Scheduled Castes, Baltis and Ladakhi Bodhs.

Suprailiac Skinfold: At age group 8+ years, Tibetans have the highest value of suprailiac skinfold and they are followed by various Dogra and Ladakhi groups. As a general trend, supra-iliac skinfold continues to increase up to age group 18+ years. At 18+ years, Dogra Rajputs have the highest value of supra-iliac skinfold and they are followed by Dogra Brahamans and Dogra Scheduled Castes. The Ladakhi groups, in general, have lower skinfold value as compared to various Ladakhi groups, Bodhs have the highest values of suprailiac skinfold, followed by Baltis and Tibetans. Gujjars, the transhumant group from the state, has lowest value of skinfolds. Among various adult groups of the state, Dogra Rajputs have the highest values and they are followed by Dogra Brahmans, Gujjars, and the Dogra Scheduled Castes, who are in turn followed by Tibetans, Ladakhi Bodhs and Baltis.

Calf Skinfold: At age group 8+ years, Tibetan children have the highest value of the calf skinfold and they are followed by the Dogra Scheduled Castes, Ladakhi Bodhs, Dogra Rajputs, Dogra Brahmans and Baltis. In general, there is an increase in the values of calf skinfolds and they continue to increase till age group 18+ years. At age group 18+ years, the Dogra Scheduled Castes have the highest value of calf skinfold followed by Dogra Rajputs, Gujjars and Dogra Brahmans. They are followed by various Ladakhi groups in the order of Tibetans, Baltis and the Ladakhi Bodhs. Among adults of Jammu and Kashmir, Dogra Rajputs have been highest value of calf skinfold followed by Dogra Scheduled Castes and Dogra Brahmans. They are followed by Tibetans, Ladakhi Bodhs, Baltis and the Gujjars.

Forearm Skinfold: At age group 8+, Tibetans have the highest value of forearm skinfold. They are followed by Ladakhi Bodhs, Dogra Rajputs, Dogra Scheduled Castes and Dogra Brahmans. The Baltis record the lowest value of forearm skinfold. No particular trend is followed in the values of forearm skinfold from age group 8+ to 18+. At 18+ years of age Dogra Scheduled Castes have the highest value of forearm skinfold followed by Dogra Rajputs, Gujjars, Dogra Brahmans, Tibetans, and Bodhs and Baltis of Ladakhi. Among adults Dogra Rajputs show highest value of forearm skinfold followed by Dogra Scheduled Castes and Dogra Brahman. They are followed by Kashmiri Muslims, Tibetans, Ladakhi Bodhs and Baltis.

Lower Extremity Length

At age group 8+ years, Dogra Rajputs have the longest lower extremity. They are followed by Dogra Brahmans, Tibetans and the Dogra Scheduled Castes. The Baltis have longer lower extremity than Bodhs though they both have shorter lower extremity than their peers extremity. As in the case of other anthropometric measurements lower extremity continue to increase from 8+ to 18+ years. At 18+ years of age Dogra Brahmans have the longest lower extremity followed by Gujjars, Dogra Scheduled Castes and Dogra Rajputs. They are followed by various Ladakhi groups however, among Ladakhi groups Baltis have the longest lower extremity followed by Ladakhi Bodhs and Tibetans. Among adults, Dogra Rajputs have the longest lower extremity followed by Gujjars, Dogra Brahmans and the Dogra Scheduled Castes. Various Ladakhi groups record less lower extremity length as compared to various groups from Jammu. However, among themselves Baltis have the longest lower extremity followed by Ladakhi Bodhs and Tibetans.

Table 3: Anthropometric, physiological measurements and indices of population groups of Jammu and Kashmir
Body weight (kg)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	21.20	2.9	21.38	3.49	23.50	2.57			-	-	20.64	1.69	21.91	3.84	20.45	3.45
9+	22.88	3.46	23.22	3.17	25.16	3.08			28.41	3.77	22.23	2.52	22.37	2.24	22.52	2.55
10+	26.24	4.23	24.62	3.03	24.77	3.09			27.38	3.47	25.80	3.45	25.11	4.50	22.83	2.98
11+	28.06	4.87	25.68	2.31	27.80	4.70			30.87	5.43	27.40	3.42	27.70	5.47	27.73	5.59
12+	31.09	6.12	28.97	5.29	30.70	4.83			35.53	6.14	31.10	3.87	32.45	9.74	29.59	3.94
13+	32.33	4.81	30.03	3.69	34.40	4.99			38.75	5.08	33.27	5.52	34.77	6.02	35.12	6.48
14+	38.72	6.13	35.05	6.69	32.64	1.86			42.94	4.55	39.61	5.76	40.25	6.78	40.54	6.91
15+	41.01	4.70	40.09	5.96	44.96	6.26			48.50	8.35	46.18	6.04	43.11	1.22	46.84	1.56
16+	45.23	5.26	41.51	7.33	48.50	6.17			51.45	4.83	46.25	5.09	48.25	3.79	46.14	7.09
17+	50.48	4.62	46.35	6.78	50.75	6.25			51.37	4.57	47.25	5.04	52.27	6.67	49.00	6.26
18+	50.86	4.81	48.91	3.91	47.00	4.12			48.83	0.81	50.92	5.66	52.97	7.60	52.52	4.31
19+ Above	55.59	6.95	54.78	6.37	56.50	7.82	61.88	8.50	61.00	3.86	60.26	4.11	60.35	16.24	55.67	6.21

Height (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	117.57	6.43	118.97	6.73	125.60	4.04			-	-	125.42	3.00	127.69	7.42	122.83	8.78
9+	122.53	7.69	123.66	6.69	127.99	4.64			138.71	6.20	127.18	5.09	127.05	8.60	128.75	4.45
10+	129.90	7.25	127.21	6.87	128.26	5.40			136.95	6.33	134.25	5.78	134.24	6.45	131.70	5.65
11+	132.82	6.55	129.50	4.86	132.56	7.43			141.18	8.63	138.87	6.74	138.22	9.07	139.33	8.83
12+	139.25	8.34	135.37	7.75	137.94	7.24			150.02	8.17	145.39	6.94	145.50	12.59	143.76	7.77
13+	140.40	7.85	138.14	6.96	145.10	8.34			153.70	5.19	148.28	7.61	148.78	8.52	152.64	9.80
14+	150.32	8.64	146.90	10.74	139.92	9.49			156.70	6.27	156.38	7.69	156.35	7.70	157.91	7.17
15+	154.09	5.34	153.90	8.45	154.84	7.50			165.92	10.57	162.92	7.11	163.88	7.67	162.32	5.09
16+	156.47	7.56	155.56	9.73	160.28	6.89			168.15	4.94	164.67	4.71	165.97	4.92	163.28	6.93
17+	161.83	5.88	159.00	8.52	161.42	4.21			168.25	4.40	165.47	6.88	168.02	6.88	165.83	6.57
18+	161.83	4.97	163.19	5.90	159.04	4.80			164.91	1.81	172.07	5.53	167.45	6.40	167.72	6.42
19+ Above	164.62	4.40	166.45	4.44	161.62	4.77	171.16	6.41	169.95	2.25	169.94	4.64	169.51	3.73	167.95	5.26

3. Sitting Height (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	64.60	4.99	64.78	5.14	66.94	3.34			-	-	65.93	2.56	66.24	3.82	66.76	9.05
9+	65.79	2.78	66.42	3.23	68.56	2.73			75.53	8.30	67.46	4.85	65.22	3.96	67.27	4.08
10+	69.73	4.01	68.58	3.28	67.93	3.33			69.63	3.76	70.37	5.74	70.39	4.96	67.40	13.21
11+	69.94	3.82	68.48	3.16	71.64	4.73			72.01	3.78	70.62	3.16	68.74	7.76	68.20	13.30
12+	72.95	4.91	72.01	5.05	72.86	3.96			75.83	3.64	74.46	4.43	75.72	7.52	73.49	3.93
13+	73.06	4.26	72.05	3.83	76.37	4.90			77.74	2.94	75.95	4.04	76.02	3.80	78.22	5.95
14+	78.03	4.95	75.59	5.04	74.48	1.79			80.55	3.10	79.71	4.38	76.27	17.66	80.12	5.00
15+	79.95	3.60	79.98	5.43	81.26	5.28			82.25	5.92	82.25	3.83	48.13	5.26	83.93	2.57
16+	81.60	4.95	81.71	5.47	84.70	3.69			85.74	3.01	84.40	3.46	86.51	2.89	83.99	3.96
17+	84.39	3.42	82.59	5.50	85.63	3.64			84.67	1.95	84.20	3.54	86.81	3.07	84.55	4.55
18+	85.54	4.41	84.32	5.71	82.96	2.88			80.90	2.53	86.72	3.29	86.60	4.12	85.75	2.80
19+ Above	86.52	3.15	87.14	3.68	85.26	2.58	87.22	4.19	83.75	1.78	85.11	3.10	85.62	2.66	84.01	2.99

4. Biacromial Diameter (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	23.69	1.44	24.78	1.66	28.62	1.29			-	-	26.60	1.70	26.74	1.97	26.25	2.39
9+	24.38	1.68	26.58	1.36	29.01	1.57			28.63	2.59	27.54	1.37	27.64	1.35	27.68	1.65
10+	25.92	1.89	27.38	1.66	28.42	2.21			29.66	1.36	29.25	1.80	28.26	2.45	28.38	1.57
11+	26.47	1.87	27.48	1.41	29.37	2.16			30.00	2.10	29.46	2.02	29.74	2.91	29.79	2.61
12+	27.62	2.25	28.26	2.38	30.37	1.73			32.20	3.07	30.20	3.03	31.51	3.58	30.83	2.01
13+	29.18	2.45	28.95	2.08	31.34	2.15			33.19	1.69	32.64	1.88	32.74	2.08	33.04	2.51
14+	30.65	2.18	30.55	2.82	30.08	3.29			34.40	2.40	34.09	2.49	34.64	2.58	34.10	3.38
15+	31.50	2.12	32.89	2.50	34.56	4.20			36.41	3.30	35.52	1.94	35.74	2.17	36.12	1.50
16+	33.08	2.79	33.43	2.70	36.61	2.09			37.33	1.58	36.71	1.81	37.27	1.91	36.03	2.03
17+	35.69	1.99	35.29	2.62	36.12	4.46			36.57	2.19	36.89	1.30	38.57	2.13	37.37	2.75
18+	36.98	2.02	36.56	1.75	36.06	2.13			36.73	0.91	38.67	1.73	39.05	2.35	39.55	1.89
19+ Above	36.24	2.23	37.46	2.68	37.79	2.14	40.19	2.35	39.00	0.91	39.95	1.51	40.20	1.71	39.00	1.60

5. Bicristal diameter (cm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	17.50	1.35	18.84	1.63	21.39	0.91			-	-	19.36	0.84	20.08	2.18	19.69	1.39
9+	18.06	1.25	20.3	1.17	21.78	1.80			21.06	0.99	20.43	2.69	19.75	0.98	20.40	1.04
10+	19.64	1.84	20.81	1.48	21.46	1.67			21.17	1.28	21.41	2.15	20.93	1.71	20.53	1.09
11+	19.83	1.86	20.95	1.51	22.21	1.79			22.25	1.70	21.49	1.48	21.84	1.95	22.30	1.81
12+	20.53	1.68	21.79	1.94	22.86	1.69			23.69	2.27	22.73	1.54	23.14	2.65	23.24	1.94
13+	21.94	1.96	22.22	1.70	24.24	1.46			24.83	1.49	23.44	2.15	23.89	1.64	24.27	2.02
14+	23.19	2.53	23.64	2.26	23.97	0.74			25.53	1.92	25.41	1.92	25.01	1.70	25.59	2.06
15+	24.25	2.26	25.52	2.18	26.58	1.45			26.53	1.67	27.01	2.85	26.94	1.77	26.80	2.63
16+	24.56	2.37	26.10	2.54	27.96	2.21			27.31	1.60	27.36	1.53	27.27	1.30	26.98	1.74
17+	26.26	1.63	27.22	1.98	27.27	1.83			27.50	2.34	27.16	1.24	24.48	1.54	27.23	1.84
18+	27.84	2.14	28.08	1.32	27.56	1.32			28.16	0.50	28.69	0.91	28.40	2.37	28.47	1.76
19+ & Above	27.89	1.96	28.2	1.61	29.45	1.93	29.78	1.97	28.45	1.21	29.07	1.55	28.57	2.28	28.93	2.74

6. Transverse Diameter of Chest (cm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	16.06	1.28	17.51	1.74	20.26	0.84			-	-	18.57	0.89	18.18	0.93	18.31	0.92
9+	16.92	1.23	19.22	1.53	20.88	0.98			19.85	1.02	18.49	0.62	18.40	0.97	18.41	1.48
10+	17.87	1.75	19.59	1.41	20.71	1.36			19.92	0.90	18.92	1.19	19.19	1.55	19.34	1.71
11+	18.02	1.90	19.37	1.62	21.11	1.50			20.20	1.57	20.11	1.69	19.69	1.57	19.87	1.62
12+	18.55	1.80	19.50	1.80	21.47	1.23			21.30	1.31	20.35	1.06	20.86	2.31	20.16	1.01
13+	19.72	1.92	19.84	1.75	21.71	1.23			23.23	4.36	20.20	4.98	21.12	1.44	21.45	1.78
14+	20.76	1.55	20.77	2.06	22.47	1.53			23.20	1.35	22.16	1.44	22.37	1.64	22.44	2.14
15+	21.30	1.86	22.26	1.95	24.89	2.84			23.95	1.89	23.52	1.66	23.63	1.93	23.50	1.50
16+	22.19	2.33	22.59	2.22	25.20	2.04			24.53	1.34	23.39	1.84	23.89	1.77	23.85	1.75
17+	24.00	2.18	24.27	2.05	26.51	2.32			23.60	1.31	24.51	1.31	25.47	1.77	24.57	1.23
18+	25.40	1.72	24.88	1.89	25.36	1.64			25.68	0.85	25.78	1.44	25.95	1.75	25.47	1.63
19+ & Above	25.44	3.01	25.56	1.58	26.98	2.00	27.10	2.03	25.62	1.10	26.92	2.39	26.39	2.27	26.05	1.42

7. Antero Posterior Diameter of Chest (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	12.03	1.60	13.58	1.81	15.59	0.71			-	-	13.94	1.00	13.79	1.04	13.79	0.85
9+	12.25	1.45	14.70	1.34	16.16	0.93			14.35	1.03	14.27	0.85	14.15	1.01	13.72	1.18
10+	13.05	1.78	14.56	1.31	16.58	0.85			13.56	1.60	14.71	1.72	14.56	1.46	14.40	1.49
11+	12.91	1.68	14.56	1.24	16.78	0.88			14.77	1.12	15.31	1.98	14.78	1.13	14.93	1.13
12+	12.94	1.36	14.49	1.52	17.01	1.36			14.82	1.05	15.71	1.54	15.38	1.37	15.50	1.26
13+	14.08	1.51	14.72	1.58	16.23	1.57			15.63	1.45	15.09	3.86	16.22	1.23	16.17	1.40
14+	14.78	1.70	15.69	1.84	16.84	0.64			17.28	1.64	16.47	1.30	16.81	1.27	17.16	1.63
15+	15.11	1.60	16.49	1.55	18.8	1.27			17.33	1.33	17.94	1.12	17.15	1.50	17.74	1.26
16+	16.24	2.02	16.81	1.61	19.13	1.11			18.09	0.82	18.14	1.32	17.66	0.73	18.50	1.31
17+	17.05	1.59	17.68	1.51	20.21	1.24			17.17	0.74	18.37	1.69	18.87	1.38	18.50	1.73
18+	19.16	1.71	18.25	1.10	19.84	1.40			17.93	0.56	18.31	1.93	19.29	2.60	21.21	4.46
19+ & Above	18.76	2.28	19.10	1.49	21.41	2.00	21.14	1.83	17.75	2.98	20.02	1.27	20.46	2.67	19.21	1.90

8. Humerus Bi-Condylar Diameter (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	4.67	0.39	4.52	0.25	4.90	0.36			-	-	5.10	0.31	4.91	0.44	4.81	0.38
9+	4.83	0.73	4.75	0.30	4.91	0.27			4.98	0.27	4.77	0.25	5.03	0.35	4.94	0.22
10+	5.03	0.41	4.86	0.36	4.91	0.27			5.22	0.26	5.23	0.34	5.21	0.48	5.08	0.34
11+	5.25	0.41	4.97	0.35	5.06	0.40			5.47	0.32	5.28	0.30	5.29	0.44	5.30	0.50
12+	5.50	0.46	5.25	0.41	5.37	0.36			5.78	0.53	5.58	0.35	5.74	0.62	5.58	0.42
13+	5.53	0.54	5.36	0.39	5.58	0.36			6.05	0.29	5.94	0.57	5.81	0.40	5.80	0.42
14+	5.90	0.44	5.62	0.47	5.58	0.31			6.25	0.40	6.10	0.38	6.14	0.49	6.12	0.48
15+	6.04	0.36	6.02	0.42	6.19	0.34			6.41	0.54	6.42	0.38	6.27	0.47	6.20	0.34
16+	6.19	0.37	5.99	0.52	6.41	0.38			6.38	0.21	6.32	0.40	6.58	0.49	6.28	0.36
17+	6.47	0.28	6.19	0.34	6.44	0.34			6.60	0.14	6.35	0.37	6.59	0.26	6.34	0.44
18+	6.42	0.36	6.26	0.34	6.32	0.23			6.33	0.19	6.52	0.41	6.59	0.27	6.48	0.29
19+ & Above	6.45	0.31	6.40	0.30	6.38	0.27	6.65	0.31	6.65	1.29	6.56	0.33	6.55	0.37	6.32	0.56

9. Femur Bi-condylar Diameter (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	7.05	0.52	7.19	0.37	7.70	0.50			-	-	7.52	0.35	7.56	0.49	7.46	0.43
9+	6.99	0.48	7.30	0.44	7.75	0.35			7.50	0.74	7.46	0.52	7.64	0.34	7.74	0.48
10+	7.45	0.58	7.49	0.40	7.65	0.47			8.03	0.46	7.96	0.33	7.82	0.43	7.78	0.50
11+	7.66	0.61	7.60	0.39	8.06	0.44			8.48	0.41	7.97	0.44	8.12	0.51	8.09	0.61
12+	7.86	0.51	7.86	0.43	8.14	0.41			8.70	0.49	8.39	0.43	8.38	0.60	8.32	0.39
13+	8.05	0.50	8.03	0.45	8.41	0.37			8.80	0.31	8.54	0.53	8.64	0.45	8.52	0.45
14+	8.31	0.54	8.36	0.51	8.20	0.26			8.95	0.42	8.80	0.37	8.85	0.47	8.73	0.41
15+	8.57	0.40	8.58	0.38	8.89	0.50			8.91	0.67	8.96	0.42	8.90	0.51	8.83	0.31
16+	8.70	0.45	8.60	0.56	8.84	0.37			9.20	0.24	8.84	0.52	9.02	0.36	8.87	0.54
17+	8.89	0.27	8.71	0.39	8.88	0.31			9.20	0.55	8.91	0.51	9.31	0.49	8.99	0.48
18+	8.78	0.52	8.77	0.50	8.84	0.42			8.70	0.15	9.32	0.43	9.28	0.55	9.26	0.31
19+ & Above	9.01	0.51	8.88	0.32	8.83	0.68	9.19	0.38	8.80	0.53	9.12	0.27	9.23	0.43	8.85	0.85

10. Wrist Diameter (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	3.80	0.27	3.72	0.44	3.94	0.19			-	-	4.03	0.19	3.99	0.33	3.80	0.28
9+	3.78	0.33	3.86	0.27	4.08	0.23			4.16	0.33	3.93	0.29	3.93	0.24	4.14	0.24
10+	4.11	0.33	3.97	0.28	3.88	0.29			4.11	0.34	4.29	0.42	4.22	0.37	4.08	0.37
11+	4.18	0.29	4.03	0.28	4.17	0.25			4.47	0.30	4.31	0.42	4.29	0.36	4.39	0.98
12+	4.38	0.36	4.17	0.30	4.33	0.29			4.66	0.44	4.49	0.20	4.53	0.51	4.45	0.34
13+	4.49	0.34	4.36	0.29	4.60	0.37			4.83	0.31	4.57	0.30	4.68	0.34	4.74	0.33
14+	4.74	0.33	4.56	0.41	4.40	0.28			4.98	0.32	4.92	0.30	4.95	0.35	4.76	0.34
15+	4.92	0.30	4.80	0.29	4.83	0.37			5.11	0.48	5.01	0.35	4.96	0.34	4.90	0.35
16+	4.94	0.28	4.81	0.41	5.13	0.40			5.00	0.20	5.00	0.28	5.15	0.35	5.02	0.33
17+	5.13	0.29	4.95	0.32	5.26	0.24			4.92	0.22	5.16	0.33	5.07	0.60	5.06	0.31
18+	5.17	0.42	4.94	0.27	5.08	0.32			5.35	0.32	5.25	0.33	5.17	0.57	5.28	0.30
19+ & Above	5.18	0.27	5.10	0.37	5.24	0.32	5.41	0.35	5.45	0.25	5.24	0.43	5.35	0.24	5.12	0.58

11. Ankle Diameter (cm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	5.39	0.45	5.28	0.52	5.85	0.51			-	-	5.98	0.44	5.65	0.48	5.75	0.46
9+	5.58	0.44	5.71	0.39	5.06	0.39			6.36	0.39	5.72	0.48	5.73	0.36	5.79	0.40
10+	5.90	0.53	5.88	0.46	5.95	0.39			6.15	0.21	6.06	0.31	5.96	0.52	5.92	0.36
11+	6.08	0.42	5.95	0.40	5.74	0.62			6.58	0.38	6.05	0.50	6.18	0.48	6.13	0.44
12+	6.27	0.48	6.21	0.41	6.16	0.50			6.57	0.45	6.55	0.51	6.37	0.52	6.41	0.40
13+	6.42	0.45	6.34	0.43	6.51	0.36			6.83	0.41	6.55	0.48	6.63	0.40	6.49	0.39
14+	6.60	0.41	6.64	0.52	6.41	0.51			6.94	0.28	6.53	1.33	6.80	0.59	6.74	0.33
15+	6.84	0.40	6.85	0.39	6.8	0.29			6.73	0.44	6.85	0.36	6.84	0.45	6.90	0.37
16+	6.83	0.36	6.74	0.47	6.98	0.48			6.98	0.44	6.90	0.42	6.93	0.58	6.73	0.42
17+	7.08	0.49	6.93	0.46	6.95	0.53			6.92	0.57	6.69	0.42	6.85	0.32	6.94	0.47
18+	7.01	0.49	7.00	0.41	7.10	0.39			7.63	0.42	6.97	0.47	6.91	0.45	6.84	0.36
19+ & Above	7.28	0.56	7.16	0.48	6.80	0.31	6.99	0.37	7.32	0.23	7.31	0.43	7.18	0.59	6.91	0.56

12. Chest Circumference Inspired (cm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	64.26	3.65	63.91	3.29	66.88	2.26	71.76	2.21	-	-	63.40	2.44	63.55	3.90	63.28	3.51
9+	65.81	4.30	67.22	3.32	69.38	4.09	73.50	4.17	63.91	3.46	64.60	2.35	64.40	2.64	63.97	2.63
10+	69.13	4.30	67.12	3.63	67.90	4.21	73.48	4.84	68.16	2.70	66.90	3.31	66.15	4.32	66.56	3.11
11+	70.81	4.98	68.83	3.62	68.50	3.87	73.31	3.56	73.74	6.14	69.93	3.10	73.54	7.62	70.90	3.46
12+	73.22	4.53	71.72	4.70	69.68	3.32	74.30	3.98	76.21	4.00	68.80	7.08	74.58	5.08	74.25	5.48
13+	75.10	4.77	73.14	3.67	70.82	3.18	75.49	3.34	79.71	4.34	77.45	4.77	79.38	5.07	77.22	6.51
14+	79.82	5.73	77.06	5.55	70.47	3.70	74.21	4.34	83.00	6.88	82.09	4.72	81.40	5.62	82.59	4.65
15+	80.79	4.39	81.42	4.56	80.43	5.52	84.96	5.57	86.01	5.15	81.06	5.70	85.28	2.48	82.89	4.96
16+	84.72	4.97	80.83	6.51	81.33	4.55	86.19	5.10	86.55	4.10	84.73	4.86	89.40	5.08	86.37	5.22
17+	89.72	4.32	84.79	5.38	84.31	5.26	89.91	5.48	89.10	1.40	86.70	4.41	89.67	5.07	90.21	5.04
18+	86.83	3.37	85.54	3.58	80.30	3.72	86.46	3.35	93.27	1.78	93.78	3.95	94.07	6.64	91.71	4.86
19+ & Above	93.49	5.66	92.98	4.44	90.04	4.88	94.21	6.27								

13. Chest Circumference (Normal-cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	60.93	3.45	59.39	2.83	66.88	2.26			-	-	58.66	2.15	58.96	3.60	58.99	3.43
9+	62.21	3.62	62.00	3.40	69.38	4.09			60.91	3.09	59.37	1.97	60.71	2.26	59.24	2.58
10+	65.56	3.91	62.47	3.50	67.90	4.21			64.01	2.52	59.50	14.42	61.73	3.66	62.50	2.91
11+	66.90	4.46	63.83	3.71	68.50	3.87			66.86	5.93	60.92	14.90	63.96	4.31	63.03	11.40
12+	68.36	4.68	66.78	4.84	69.68	3.32			70.15	6.06	63.78	14.20	68.56	7.80	66.50	3.42
13+	70.75	4.38	67.83	3.65	70.82	3.18			72.10	3.69	58.22	24.30	70.07	5.25	70.48	5.15
14+	74.89	5.66	71.75	5.85	70.47	3.70			77.16	5.84	72.35	4.13	70.78	16.61	72.95	6.02
15+	76.07	4.49	75.62	4.83	80.43	5.52			79.66	5.18	76.37	5.08	73.63	17.22	77.90	4.62
16+	79.98	4.29	75.83	6.22	81.33	4.55			82.18	5.00	68.72	24.10	80.47	2.82	78.67	4.87
17+	84.66	4.27	79.25	5.64	84.31	5.26			81.50	5.09	72.71	25.03	79.47	19.39	81.08	5.01
18+	81.89	3.81	80.96	3.16	80.30	3.72			84.33	2.22	82.49	3.89	83.12	3.33	85.20	4.80
19+ & Above	89.22	4.74	89.13	4.16	90.04	4.88	92.04	5.25	88.27	3.31	76.42	3.21	89.59	5.57	87.67	0.45

14. Chest Circumference (Expired cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	58.76	3.29	56.83	3.17	64.08	2.12			-	-	56.19	2.21	56.02	3.44	56.37	3.20
9+	59.80	3.55	59.31	2.80	66.82	3.79			58.81	3.13	56.35	2.04	58.19	2.31	56.17	2.79
10+	62.99	3.62	59.89	3.64	65.20	3.91			61.00	2.66	59.83	3.59	57.95	6.96	59.89	3.18
11+	64.35	4.09	61.10	3.32	66.36	4.02			62.17	4.97	59.11	10.33	61.65	4.35	61.43	3.95
12+	65.89	4.73	64.20	4.51	67.45	3.79			66.55	5.33	62.75	3.87	65.81	7.76	65.53	3.01
13+	68.01	4.31	64.96	3.30	67.93	2.75			67.93	3.70	62.05	15.45	67.37	4.28	67.20	4.85
14+	72.53	5.60	68.96	6.08	67.72	3.94			72.81	4.73	69.96	4.18	70.90	4.86	67.77	3.97
15+	73.07	4.32	72.80	4.85	77.73	5.42			75.48	7.31	73.98	5.14	71.08	11.14	74.66	4.35
16+	77.17	4.68	72.91	6.44	78.34	4.24			77.60	4.08	73.11	5.05	73.62	16.20	74.50	5.24
17+	81.61	4.49	75.90	5.15	81.22	5.01			77.47	5.18	76.63	3.76	77.68	13.48	77.51	4.97
18+	78.53	3.90	77.35	2.91	78.00	3.95			77.13	2.82	78.62	4.36	79.05	4.40	81.11	5.08
19+ & Above	85.55	4.84	83.86	9.90	90.04	4.88	89.42	5.80	84.22	2.68	85.68	3.78	85.37	5.86	83.7	5.00

15. Upper Arm Circumference (Relaxed cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	15.39	1.33	14.01	0.93	16.80	1.05			-	-	15.90	1.20	15.41	1.04	15.26	1.47
9+	15.65	1.35	14.67	4.23	17.12	1.11			16.31	0.71	16.00	2.19	15.26	0.72	15.24	1.07
10+	16.30	1.32	15.10	0.93	16.19	1.06			16.11	1.05	16.41	1.42	16.10	1.49	15.93	1.27
11+	16.71	1.35	15.37	1.20	17.18	1.29			17.13	1.26	16.85	1.88	16.60	1.33	16.09	3.47
12+	17.20	1.51	15.96	1.43	17.82	1.37			18.12	1.56	16.74	1.05	17.75	2.09	16.60	1.02
13+	17.54	1.34	15.97	2.23	18.18	1.11			18.57	1.19	17.65	1.56	18.45	1.66	17.89	1.62
14+	19.00	1.65	17.19	1.71	17.70	0.61			20.87	2.11	18.99	1.50	19.26	1.77	18.86	2.05
15+	19.12	1.43	18.27	1.55	20.29	1.82			20.71	2.12	19.87	1.83	19.81	2.06	20.15	1.38
16+	19.96	1.35	18.81	1.89	20.96	1.58			21.48	1.33	20.61	1.89	21.34	1.64	20.28	1.75
17+	21.36	1.22	20.22	1.98	21.74	0.80			21.37	0.94	20.88	1.44	21.84	1.47	21.61	2.45
18+	21.67	1.64	20.28	1.27	20.22	1.85			21.37	0.76	21.67	2.08	23.03	1.62	21.77	1.78
19+ & Above	22.08	1.36	22.06	1.8	23.39	1.85	24.15	1.93	24.20	0.72	23.78	1.43	24.23	2.92	22.64	2.13

16. Upper Arm Circumference (Contracted - cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	16.93	1.57	15.67	1.17	18.53	0.97										
9+	17.26	1.46	16.54	1.70	18.65	1.36										
10+	18.00	1.41	16.84	1.23	17.74	1.04										
11+	18.29	1.93	17.22	1.60	19.19	1.72					18.18	1.42	18.36	1.54	17.73	3.98
12+	19.32	1.81	17.92	2.02	19.53	1.59			20.44	2.51	18.57	1.14	19.34	2.60	18.36	1.16
13+	19.63	1.78	18.08	2.43	20.22	1.59			21.19	1.24	19.73	1.80	20.42	2.13	19.91	1.89
14+	21.15	2.13	19.39	2.00	19.74	0.65			23.03	2.33	21.13	2.14	21.88	2.25	21.24	2.53
15+	21.70	1.74	20.90	1.90	23.42	2.24			23.50	2.81	22.79	2.19	22.65	2.43	22.93	1.47
16+	22.71	2.26	21.43	2.15	23.76	2.13			24.67	1.70	22.83	2.38	24.19	1.73	22.83	1.98
17+	24.70	1.73	23.04	2.57	25.81	1.76			24.85	1.69	23.65	1.86	25.38	1.86	24.16	2.55
18+	24.80	1.77	23.47	1.63	23.48	1.28			25.71	0.62	24.35	2.51	26.35	2.24	25.10	1.60
19+ & Above	25.22	1.87	25.27	2.38	26.15	1.67	27.32	2.31	28.17	1.81	27.91	2.05	28.17	3.78	26.32	3.12

17. Calf Girth (cm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	22.14	1.83	21.06	1.52	23.20	0.98			-	-	22.54	1.85	22.12	1.67	21.96	2.70
9+	22.83	1.77	21.82	1.57	23.75	0.88			23.41	1.27	22.43	1.74	21.48	1.78	22.22	1.65
10+	23.76	2.11	22.69	1.44	23.20	1.89			23.62	1.41	23.54	1.39	23.02	1.87	22.58	1.36
11+	24.40	1.80	22.74	1.43	24.99	1.69			25.31	1.64	22.89	2.88	24.15	1.83	24.10	2.20
12+	25.41	2.24	23.91	2.13	25.65	2.20			26.25	2.48	24.43	1.30	25.61	3.10	24.14	1.31
13+	25.93	2.07	24.36	1.74	26.36	1.84			27.62	1.79	25.46	1.95	26.20	2.26	26.15	2.36
14+	27.81	2.29	25.94	2.30	26.42	1.04			29.25	1.64	27.27	1.50	28.10	2.31	27.17	2.05
15+	28.19	1.94	27.24	2.11	30.05	1.43			30.41	2.30	29.38	2.25	29.10	2.28	28.72	1.74
16+	29.34	1.95	27.20	2.86	31.16	1.89			31.00	2.02	29.34	2.13	29.98	2.00	29.14	2.21
17+	31.06	1.76	28.88	2.23	31.17	1.52			31.05	1.21	29.46	2.51	30.42	2.55	29.94	2.21
18+	30.62	2.20	29.36	1.65	29.90	0.60			30.33	0.71	30.51	2.10	31.96	2.89	31.32	1.94
19+ & Above	31.06	2.25	30.92	2.12	29.66	3.44	32.62	2.95	33.27	2.08	32.75	1.62	33.17	3.21	31.92	3.32

18. Biceps Skin Fold (mm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	2.67	0.87	2.45	0.64	4.16	0.71			-	-	3.57	0.50	3.66	0.81	3.22	0.89
9+	2.75	1.16	2.53	0.67	4.13	0.91			3.38	0.51	3.94	0.97	3.75	0.41	3.35	0.70
10+	2.73	1.04	2.47	0.64	4.00	1.41			3.11	0.92	3.40	0.82	3.62	1.24	5.48	1.37
11+	2.70	1.19	2.47	0.80	3.80	0.78			4.62	1.40	3.85	1.38	3.59	0.90	5.81	1.61
12+	2.73	1.06	2.68	0.70	3.60	0.69			3.57	0.93	3.08	1.08	3.57	0.74	2.90	0.75
13+	2.75	0.83	2.44	0.68	3.54	0.93			3.00	0.47	3.45	1.27	3.75	1.94	3.11	1.12
14+	2.76	0.94	2.54	0.80	3.71	0.75			4.66	1.58	3.47	0.81	3.59	1.00	3.36	0.90
15+	2.74	0.97	2.77	0.69	3.23	0.43			4.00	1.06	3.81	2.03	3.27	0.98	5.52	1.99
16+	3.06	0.73	2.80	0.71	3.55	0.60			3.10	0.56	4.30	1.65	3.40	0.99	3.14	0.72
17+	3.29	0.69	2.92	0.85	3.33	1.00			3.50	0.57	3.45	0.60	3.85	0.81	3.55	1.05
18+	3.18	0.84	3.05	1.01	3.00	0.00			4.00	0.63	3.75	0.63	4.00	0.76	4.16	2.00
19+ & Above	3.58	1.37	3.23	1.67	4.08	1.62	4.15	1.73	3.00	1.41	4.52	1.66	4.92	3.03	4.35	2.10

19. Triceps Skin Folds (mm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	6.97	1.85	4.75	1.18	9.33	1.37			-	-	5.95	1.28	6.33	1.20	5.77	1.60
9+	6.21	2.12	4.82	1.32	8.53	2.03			6.00	1.09	6.52	1.30	6.10	1.29	5.88	0.85
10+	6.58	2.52	4.71	1.33	7.18	1.77			4.44	1.01	6.70	2.29	6.07	1.41	6.12	1.83
11+	6.48	2.15	5.10	1.70	7.10	1.19			6.62	2.38	6.00	1.68	6.45	1.76	6.68	3.20
12+	6.23	2.24	5.13	1.35	7.50	1.77			5.57	1.55	5.47	1.41	6.47	1.88	5.22	1.19
13+	5.95	1.56	4.78	1.45	7.00	2.14			5.30	1.05	5.75	1.88	7.00	3.71	5.44	1.39
14+	6.00	1.51	5.23	1.43	6.85	1.34			7.11	3.01	6.04	1.53	6.13	1.42	5.24	1.16
15+	5.31	1.86	4.79	1.20	7.00	2.58			5.50	2.32	6.40	2.98	5.40	1.59	5.64	1.25
16+	6.27	1.73	5.10	1.46	6.50	1.50			6.40	2.27	6.40	1.98	5.90	1.29	5.57	1.56
17+	6.48	1.82	5.80	1.36	6.60	1.73			6.25	1.70	6.25	1.51	7.05	2.45	5.75	1.88
18+	5.84	1.56	5.69	1.92	5.40	1.14			7.33	1.36	5.85	1.38	6.88	2.37	6.94	2.04
19+ & Above	6.38	2.41	5.80	2.49	7.83	2.72	7.26	2.55	5.25	1.89	8.00	2.16	8.48	4.70	7.15	2.45

20. Subscapular Skinfolds (mm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	3.61	0.77	3.16	0.68	5.33	1.37			-	-	4.66	0.65	4.54	0.83	4.27	0.82
9+	3.43	0.72	3.56	0.65	5.26	2.03			4.33	0.51	4.68	0.82	4.30	1.03	4.17	0.88
10+	4.02	1.31	3.31	0.57	5.36	1.77			3.88	0.92	5.00	1.33	4.33	1.17	4.78	1.08
11+	3.93	1.07	3.58	0.74	5.40	1.19			4.87	1.53	4.50	0.76	4.77	0.92	5.37	2.26
12+	3.86	0.92	3.81	0.81	5.40	1.77			4.92	0.91	4.08	0.73	4.90	1.17	4.31	0.99
13+	3.95	0.94	3.74	0.79	5.45	2.14			4.70	0.82	4.95	0.94	5.35	2.05	5.37	1.14
14+	4.53	0.88	4.17	1.10	5.00	1.34			5.58	1.26	5.57	1.16	5.72	1.24	5.44	1.22
15+	4.63	0.98	4.75	0.90	6.30	2.58			6.25	1.66	6.18	1.40	5.54	1.47	6.32	1.65
16+	5.51	1.40	4.78	1.05	6.90	1.50			6.10	1.44	5.95	1.23	6.05	1.09	6.14	1.10
17+	6.77	1.78	5.95	1.37	7.22	1.73			6.50	0.57	6.25	1.37	7.15	2.13	6.55	1.53
18+	5.78	1.26	6.08	1.02	7.20	1.14			6.83	0.98	6.30	1.26	7.00	2.76	10.05	1.71
19+ & Above	7.50	3.22	8.00	2.79	9.18	1.99	9.90	2.88	8.25	1.50	7.95	2.26	11.40	4.80	8.35	3.23

21. Suprailiac Skinfold (mm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	2.94	1.07	2.45	0.80	4.33	1.15			-	-	3.71	0.56	3.66	0.76	3.81	1.13
9+	3.13	1.22	2.43	0.70	4.13	1.18			3.50	0.54	4.42	1.34	3.80	1.05	3.47	0.71
10+	3.14	1.22	2.43	0.55	4.36	1.36			3.66	1.58	4.05	1.05	3.81	1.14	3.93	0.99
11+	3.43	1.49	2.77	0.71	3.90	0.87			5.00	2.67	4.20	1.60	4.00	1.34	4.37	1.77
12+	3.61	1.90	3.25	1.16	4.70	1.25			4.28	1.89	3.86	1.05	4.52	1.66	3.45	1.05
13+	3.86	1.17	3.17	1.02	4.45	1.21			3.80	1.13	4.15	1.56	5.00	2.71	3.96	1.45
14+	3.83	1.11	3.37	0.89	4.57	1.51			5.77	2.99	4.76	1.44	4.54	1.05	4.16	0.94
15+	3.80	0.94	3.55	0.94	4.84	1.34			4.87	1.80	5.31	2.60	4.95	1.52	4.56	1.47
16+	4.88	1.46	3.95	1.36	5.30	1.08			4.20	0.91	5.95	2.06	4.85	1.56	4.66	1.19
17+	5.22	1.17	4.57	1.61	5.11	0.78			5.25	1.25	5.35	1.53	5.35	3.39	5.30	1.71
18+	5.09	1.07	4.63	1.17	4.60	0.54			4.16	0.40	5.75	2.40	5.94	2.33	5.16	2.38
19+ & Above	5.82	2.47	5.73	3.14	6.00	1.41	5.77	2.52	6.25	4.57	6.28	2.30	7.74	4.33	6.00	3.37

22. Calf Skinfold (mm)

Age (in years)	Ladakh						Kashmir		Jammu							
	Bodhs		Baltis		Tibetans		Muslims		Gujjars		Dogra Brahmans		Dogra Rajputs		Dogra Scheduled Castes	
	Mean	S.D	Mean	S.D.	Means	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
8+	5.50	2.04	4.21	1.20	6.58	1.56			-	-	4.38	0.92	5.08	1.50	5.81	1.65
9+	4.70	1.95	3.82	1.20	5.78	1.47			4.50	1.51	5.63	1.34	4.30	0.97	4.88	0.99
10+	5.12	1.95	3.78	1.11	4.72	1.61			5.22	1.09	6.40	1.05	5.33	1.88	5.63	1.74
11+	4.89	2.06	4.15	1.68	5.40	0.96			7.25	2.25	5.70	1.60	5.45	1.40	6.12	3.06
12+	5.38	1.99	4.65	1.58	6.40	2.06			7.14	1.87	5.78	1.05	5.52	1.96	5.50	1.40
13+	4.85	1.61	4.02	1.37	4.90	2.02			5.50	1.43	5.95	1.56	6.20	3.12	5.92	1.56
14+	5.65	2.21	4.86	1.81	5.33	0.81			6.83	2.89	6.04	1.44	6.31	1.88	5.68	1.24
15+	5.46	2.25	4.74	1.37	6.27	1.00			6.25	2.43	7.04	2.60	5.72	2.22	6.00	1.35
16+	6.04	2.03	4.60	2.12	5.81	1.37			7.00	2.40	5.8	2.06	5.70	1.08	5.95	1.39
17+	5.74	1.52	4.82	1.37	5.75	1.70			6.50	1.29	6.00	1.53	6.20	2.76	6.45	2.66
18+	4.63	1.74	4.97	1.34	5.20	0.83			5.83	1.60	5.80	2.40	6.50	2.47	7.11	1.78
19+ & Above	4.70	1.81	4.50	1.98	5.09	1.44	4.00	1.39	4.50	1.73	6.19	2.13	7.18	4.45	6.25	3.20

23. Forearam Skinfold (mm)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	4.05	1.43	3.10	0.84	4.83	1.11										
9+	3.67	1.73	2.80	0.67	4.86	1.24			1.83	0.51	3.68	0.14	3.45	1.05	3.70	0.84
10+	3.70	1.69	2.57	0.64	4.63	1.80			1.71	0.31	4.35	1.22	3.81	1.27	4.03	1.10
11+	3.25	1.37	2.80	0.98	4.90	1.66			2.00	0.51	3.85	1.18	4.04	1.13	4.00	1.24
12+	3.36	1.58	2.88	1.06	4.80	0.91			2.15	0.44	3.69	0.76	3.85	1.10	3.54	1.22
13+	3.26	1.34	2.70	0.71	4.45	1.12			2.37	0.61	3.90	1.41	3.85	1.42	3.44	0.89
14+	2.69	0.83	2.96	0.99	4.28	1.79			2.44	0.54	3.57	0.92	3.59	0.79	3.60	0.57
15+	2.82	1.02	2.77	0.57	4.00	0.57			2.72	0.52	3.45	0.59	3.59	1.00	3.48	0.77
16+	3.27	1.07	2.93	1.14	4.00	0.56			3.08	0.71	3.55	1.60	3.25	0.44	3.38	0.58
17+	3.06	0.68	3.10	0.84	3.55	0.72			3.24	0.26	3.55	0.60	3.85	0.74	3.45	0.51
18+	3.00	0.79	3.00	0.67	3.40	0.89			3.65	0.24	3.45	0.68	3.83	1.33	3.94	0.87
19+ & Above	3.17	1.33	2.93	1.43	3.75	0.96	3.78	0.71	3.25	1.25	4.09	1.41	4.14	1.48	3.80	1.15

24. Somatotype Component (I Endomorphy)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	1.86	0.54	1.28	0.40	2.57	0.41			-	-	1.78	0.30	1.76	0.29	1.73	0.37
9+	1.63	0.51	1.30	0.37	2.36	0.55			1.54	0.19	1.95	0.37	1.72	0.43	1.59	0.26
10+	1.66	0.68	1.21	0.33	2.19	0.48			1.29	0.42	1.82	0.60	1.60	0.41	1.73	0.44
11+	1.63	0.56	1.31	0.42	2.04	0.30			1.88	0.84	1.63	0.45	1.68	0.45	1.80	0.80
12+	1.51	0.59	1.34	0.38	2.12	0.57			1.52	0.45	1.34	0.30	1.67	0.52	1.30	0.38
13+	1.44	0.39	1.23	0.38	1.90	0.56			1.34	0.20	1.49	0.48	1.78	0.96	1.43	0.44
14+	1.47	0.32	1.28	0.34	1.93	0.49			1.94	0.86	1.59	0.43	1.58	0.35	1.36	0.27
15+	1.33	0.39	1.24	0.30	1.91	0.48			1.55	0.47	1.67	0.74	1.42	0.40	1.45	0.52
16+	1.69	0.50	1.33	0.37	1.90	0.36			1.53	0.45	1.71	0.48	1.51	0.36	1.40	0.34
17+	1.85	0.53	1.61	0.40	1.92	0.27			1.70	0.29	1.65	0.43	1.78	0.81	1.60	0.44
18+	1.62	0.34	1.57	0.43	1.72	0.14			1.79	0.91	1.57	0.50	1.82	0.69	1.71	0.65
19+ & Above	1.94	0.77	1.89	0.85												

25. Somatotype Component (II Mesomorphy)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	3.94	0.87	3.33	0.66	3.89	0.50			-	-	3.68	0.65	2.89	0.82	3.47	0.97
9+	3.58	0.91	3.27	0.67	3.62	0.54			2.07	0.71	3.02	0.63	3.18	0.50	3.03	0.63
10+	3.33	0.71	3.20	0.63	3.41	0.49			2.87	0.70	3.19	0.56	2.93	0.67	2.99	0.97
11+	3.43	0.82	3.13	0.68	3.76	0.40			3.14	0.60	2.78	0.81	2.95	0.55	2.60	0.63
12+	3.27	0.65	3.07	0.69	3.52	0.40			2.87	0.81	2.52	0.65	2.96	0.83	2.61	0.60
13+	3.38	0.80	3.02	1.02	3.19	0.92			3.09	0.57	2.91	0.92	3.02	0.90	2.36	1.20
14+	3.22	0.64	2.77	0.71	3.67	0.57			3.54	0.97	2.70	0.70	3.03	0.89	2.49	0.65
15+	3.10	0.71	2.80	0.70	3.72	1.09			2.76	0.77	2.83	0.92	2.52	1.16	2.56	0.94
16+	3.30	0.72	2.68	0.77	3.60	0.54			2.87	0.94	2.47	1.22	2.99	0.85	2.62	0.66
17+	3.64	0.78	3.01	0.85	0.54	0.70			3.09	0.55	2.60	1.14	3.17	0.93	2.79	0.56
18+	3.51	0.83	2.71	0.90	3.41	0.59			3.05	0.60	2.44	1.46	3.66	1.05	3.18	0.82
19+ & Above	3.42	0.82	3.03	0.86												

26. Somatotype Component (III Ectomorphy)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	2.90	1.03	3.21	1.29	3.92	1.33			-	-	5.26	0.66	5.29	0.90	4.71	1.11
9+	3.43	0.94	3.53	0.89	3.80	0.85			5.13	0.62	4.92	0.73	4.79	0.91	5.20	0.92
10+	3.87	1.02	3.82	0.94	4.03	0.73			5.10	0.96	5.12	1.02	5.45	0.91	5.34	1.05
11+	3.88	1.08	3.93	0.9	3.89	0.80			4.98	0.72	5.08	1.13	5.36	0.69	5.56	1.17
12+	4.35	0.70	4.16	0.92	4.13	0.14			5.39	0.63	5.70	1.03	5.50	1.08	5.88	0.70
13+	4.15	1.30	4.38	1.24	4.53	0.91			5.15	0.69	5.68	1.28	5.31	1.36	6.08	1.38
14+	4.44	0.83	4.78	0.96	3.86	1.36			4.63	1.10	5.49	0.87	5.38	1.16	5.62	0.86
15+	4.60	0.76	4.83	0.87	3.77	1.06			5.29	1.06	5.16	1.20	5.72	1.18	5.29	1.37
16+	4.03	0.83	4.84	0.88	4.07	0.96			4.99	1.07	5.50	1.17	5.25	1.03	5.29	1.14
17+	4.92	0.94	4.32	0.93	3.86	0.77			5.02	1.16	5.41	1.41	4.82	1.19	5.67	1.01
18+	3.86	0.88	4.54	1.16	4.12	1.25			4.87	0.26	5.92	1.23	4.60	1.27	4.67	1.35
19+ & Above	3.51	1.15	4.00	1.03												

27. Somatotype Attitudinal Distance (SAD)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9+	0.672	-	0.33	-	0.36	-	-	-	-	-	0.76	-	0.57	-	0.98	-
10+	0.515	-	0.30	-	0.35	-	-	-	0.83	-	0.29	-	1.08	-	0.20	-
11+	0.104	-	0.16	-	0.40	-	-	-	0.70	-	0.45	-	0.12	-	0.75	-
12+	0.510	-	0.26	-	0.34	-	-	-	0.65	-	0.73	-	0.14	-	0.73	-
13+	0.210	-	0.27	-	0.56	-	-	-	0.43	-	0.41	-	0.22	-	0.34	-
14+	0.330	-	0.47	-	0.82	-	-	-	0.91	-	0.30	-	0.21	-	0.83	-
15+	0.240	-	0.70	-	0.66	-	-	-	1.09	-	0.38	-	0.85	-	0.67	-
16+	0.700	-	0.34	-	0.32	-	-	-	0.32	-	0.52	-	0.96	-	0.07	-
17+	0.960	-	0.67	-	0.21	-	-	-	0.27	-	0.16	-	0.84	-	0.75	-
18+	1.090	-	0.37	-	0.35	-	-	-	0.17	-	0.54	-	0.53	-	1.07	-
19+ & Above																

28. Somatotype Disparsion Distance (SDD)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+																
9+	1.62		0.71		0.50				-	-	1.24		2.05		1.27	
10+	1.48		0.72		0.86				1.89		0.82		1.70		0.76	
11+	0.23		0.35		1.00				1.23		0.81		1.30		1.17	
12+	1.22		0.51		0.82				1.44		2.02		0.47		1.59	
13+	0.53		0.61		1.37				0.88		0.71		0.83		1.87	
14+	0.91		0.61		1.67				2.09		0.60		0.49		1.31	
15+	0.58		0.16		0.16				2.55		1.20		1.47		0.82	
16+	1.72		0.36		0.65				0.98		1.30		1.40		0.92	
17+	1.31		0.79		0.86				0.33		0.27		1.48		0.49	
18+	1.76		0.75		0.82				0.39		1.54		1.00		2.23	
19+ & Above	11.36		5.57		8.71				11.78		10.15		12.17		12.43	

29. Lower Extermity Length

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	52.97	4.81	54.18	5.74	68.65	2.89			-	-	59.48	2.12	61.45	5.27	56.06	3.63
9+	56.75	5.48	57.24	5.17	59.43	3.59			63.18	9.51	59.72	5.45	61.81	4.76	61.47	4.94
10+	60.28	4.36	58.63	4.77	60.32	3.17			67.32	3.85	63.82	6.11	63.85	6.49	64.29	13.72
11+	62.88	3.94	61.02	3.00	60.92	3.69			69.80	6.33	66.25	4.52	69.48	11.83	71.12	14.66
12+	66.30	4.15	63.36	7.39	65.08	4.07			74.45	5.03	70.92	7.05	70.25	8.29	70.27	5.61
13+	67.33	4.59	66.08	4.45	68.73	3.60			75.96	2.60	72.33	4.66	72.76	5.85	74.41	5.63
14+	72.29	5.02	71.31	6.55	65.44	8.22			76.14	4.44	76.61	5.53	80.07	12.38	77.78	6.57
15+	74.14	4.20	73.95	4.81	73.57	3.62			83.70	5.64	80.67	5.70	79.75	3.84	78.39	3.60
16+	74.87	4.19	73.84	5.18	75.58	3.65			82.41	5.11	80.27	3.95	79.75	3.72	79.29	4.02
17+	77.42	4.38	76.40	5.66	75.78	3.06			83.57	3.79	81.26	6.80	81.21	4.89	81.08	4.15
18+	76.28	4.50	78.86	5.83	76.08	3.12			84.01	1.07	85.34	4.67	80.85	4.80	81.96	5.42
19+ & Above	78.23	3.51	79.30	3.29	76.35	4.13			86.37	3.72	84.78	3.20	87.00	16.55	83.24	5.70

30. Body Fat (Percent)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	2.37	1.79	1.33	1.06	5.71	2.16			-	-	6.72	1.71	6.98	1.77	5.71	2.16
9+	2.38	1.79	1.76	1.26	5.42	2.50			3.78	1.06	7.34	1.53	6.48	2.27	5.42	2.50
10+	3.00	2.85	1.62	0.97	5.77	2.36			3.44	2.47	7.77	3.42	6.48	2.28	5.77	2.36
11+	3.22	2.50	2.12	1.31	5.34	1.50			5.86	3.89	6.59	2.15	7.33	2.49	5.34	1.50
12+	3.35	2.71	2.92	1.86	6.17	2.16			5.23	2.32	5.62	1.77	7.48	2.55	6.17	2.16
13+	3.19	1.98	2.76	1.64	5.97	2.22			4.48	1.81	6.77	2.73	8.31	4.86	5.97	2.22
14+	4.34	1.73	3.45	1.75	5.62	2.01			7.70	4.02	7.74	2.13	7.98	2.43	5.62	2.01
15+	4.42	1.81	4.28	1.70	7.27	1.76			7.21	2.93	8.33	4.15	7.04	2.65	7.27	1.76
16+	6.46	2.65	4.73	2.19	8.32	2.56			6.38	2.05	8.46	2.77	8.09	1.81	8.32	2.56
17+	8.12	2.48	6.59	2.65	8.50	0.88			7.90	0.97	8.63	2.33	10.23	3.99	8.50	0.88
18+	6.98	1.99	6.82	1.91	7.95	1.33			7.13	1.30	8.28	2.19	9.91	4.06	7.95	1.33
19+ & Above	9.29	4.74	9.66	5.03	11.25	2.94			10.45	5.57	11.96	3.51	15.12	7.03	11.25	2.94

31. Body Surface Area

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	83.00	7.00	84.00	8.00	91.27	5.49			-	-	86.35	4.22	89.65	10.27	84.70	10.25
9+	88.00	9.00	89.00	8.00	95.28	6.98			106.39	9.25	90.02	6.67	90.20	6.37	91.30	6.15
10+	98.00	10.00	94.00	8.00	94.82	7.62			103.77	8.53	99.67	8.41	98.50	10.36	95.05	7.59
11+	102.00	10.00	96.00	5.00	101.95	11.08			111.95	13.16	103.73	8.57	104.91	13.51	105.50	13.23
12+	110.00	13.00	105.00	11.00	109.43	10.88			123.93	13.80	114.39	9.42	116.22	21.52	111.10	10.49
13+	113.00	10.00	108.00	8.00	119.23	12.08			130.71	10.24	119.30	12.14	121.84	12.98	124.66	14.79
14+	128.00	13.00	121.00	15.00	113.53	6.00			138.50	9.37	133.58	12.64	134.38	14.00	135.79	14.02
15+	134.00	9.00	132.00	13.00	139.99	12.23			151.94	18.13	146.89	11.42	139.81	33.33	146.91	13.03
16+	141.00	11.00	135.00	16.00	148.25	11.64			157.40	8.21	148.12	8.72	151.75	7.18	147.00	13.59
17+	151.00	90.00	144.00	14.00	151.62	9.83			157.38	7.31	150.02	9.71	158.33	12.11	152.44	11.97
18+	152.00	80.00	150.00	7.00	145.52	7.86			151.90	2.12	159.30	9.63	158.72	13.06	158.52	7.61
19+ & Above	160.00	10.00	159.20	9.00	150.20	10.74			170.76	5.15	169.67	7.10	170.92	15.62	162.47	7.96

32. Forced Vital Capacity (FVC)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	1.54	0.21	1.62	0.16	1.64	0.36			-	-	1.53	0.41	1.65	0.46	1.66	0.48
9+	1.43	0.17	1.77	0.39	1.13	0.25			1.83	0.51	1.65	0.46	1.62	0.42	1.43	0.38
10+	1.73	0.18	2.11	0.46	1.60	0.11			1.71	0.31	1.61	0.23	1.69	0.45	1.76	0.44
11+	1.89	0.27	2.30	0.10	1.44	0.32			2.00	0.51	1.96	0.39	1.82	0.40	1.84	0.39
12+	2.29	0.19	2.81	0.15	2.02	0.62			2.15	0.44	1.92	0.45	2.10	0.56	1.88	0.39
13+	2.62	0.13	2.87	0.16	2.08	0.54			2.37	0.61	2.06	0.54	2.20	0.41	2.09	0.65
14+	2.82	0.34	3.19	0.25	1.91	0.44			2.44	0.54	2.35	0.37	2.42	0.54	2.71	0.49
15+	3.23	0.25	3.32	0.28	2.46	0.63			2.72	0.52	2.69	0.50	2.92	0.54	2.71	0.49
16+	3.36	0.40	3.15	0.70	2.92	0.95			3.08	0.71	2.72	0.47	3.00	0.70	2.79	0.65
17+	3.84	0.19	3.56	0.34	3.25	0.57			3.24	0.26	3.17	0.48	2.91	0.59	2.99	0.70
18+	4.24	0.24	3.71	0.34	3.35	0.93	3.78	0.71	3.65	0.24	3.00	0.59	3.05	0.68	2.96	0.48
19+ & Above			3.62	0.66												

33. Forced Expiratory Volume (FEV)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	1.38	0.18	1.53	0.08	1.44	0.43			-	-	1.53	0.30	1.43	0.45	1.49	0.47
9+	1.45	0.16	1.57	0.42	1.20	0.36			1.90	0.37	1.54	0.38	1.45	0.39	1.38	0.35
10+	1.59	0.15	1.91	0.33	1.59	0.11			1.41	0.28	1.53	0.24	1.56	0.25	1.52	0.31
11+	1.80	0.25	2.03	0.25	1.43	0.32			1.83	0.39	1.83	0.31	1.70	0.53	1.69	0.34
12+	2.17	0.17	2.46	0.27	1.76	0.40			1.89	0.38	1.74	0.36	2.00		1.71	0.42
13+	2.44	0.15	2.79	0.14	1.83	0.51			2.10	0.50	1.90	0.50	2.11	0.36	1.98	0.55
14+	2.69	0.31	2.95	0.20	1.85	0.43			2.10	0.40	2.15	0.38	2.27	0.46	2.37	0.52
15+	3.11	0.21	3.04	0.32	2.41	0.63			2.52	0.52	2.51	0.46	2.58	0.50	2.50	0.45
16+	3.07	0.42	2.87	0.72	2.68	0.65			2.85	0.56	2.62	0.43	2.72	0.56	2.74	0.65
17+	3.83	0.14	3.37	0.31	3.06	0.50			2.97	0.29	3.02	0.34	2.80	0.57	2.82	0.63
18+	3.95	0.22	3.52	0.26	3.16	0.78	3.12	0.69	3.43	0.57	2.80	0.54	2.89	0.67	2.82	0.42
19+ & Above			3.39	0.63												

34. Peak Expiratory Flow (PEF)

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	165.28	23.5	170.00	14.09	138.33	50.11			-	-	158.42	51.07	161.91	60.04	155.81	51.86
9+	160.00	28.71	201.10	43.83	117.60	32.33			197.5	42.06	171.55	39.84	158.55	36.41	152.17	34.38
10+	192.00	28.26	182.14	22.64	210.00	33.94			192.66	45.34	178.85	54.66	166.35	54.34	160.57	41.05
11+	202.28	15.47	254.28	69.36	187.00	57.59			181.12	34.52	205.70	42.62	193.63	58.96	197.12	70.40
12+	233.20	18.32	278.12	29.36	170.66	60.40			226.21	85.41	204.90	55.31	227.71	88.71	181.95	59.47
13+	242.00	21.31	300.20	12.53	201.40	67.41			219.00	65.34	223.26	85.12	231.20	56.11	228.40	67.04
14+	262.00	34.31	304.42	20.39	208.00	95.77			235.22	73.47	251.88	80.34	265.78	95.96	258.47	91.68
15+	329.00	22.50	301.20	23.42	297.10	108.28			274.87	130.60	307.28	85.95	300.00	88.45	289.50	60.45
16+	309.00	43.53	374.85	74.87	308.12	74.82			355.10	111.15	337.60	65.59	304.20	75.99	329.76	10.70
17+	393.60	52.64	336.66	39.30	351.33	99.91			274.00	45.34	340.85	59.09	327.20	68.00	346.68	80.22
18+	450.50	50.23	389.40	71.87	330.50	86.35	348.92	100.04	404.33	31.88	313.85	95.77	340.83	95.00	329.27	64.21
19+ & Above			396.40	83.68												

35. Stature Index

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	54.95	3.06	54.48	3.62	54.17	3.79			-	-	52.26	1.41	51.92	2.15	53.29	1.91
9+	53.76	1.82	53.77	2.22	54.28	3.07			54.5	6.31	53.07	3.53	51.36	2.65	53.58	1.85
10+	53.65	1.60	53.96	1.83	51.24	9.96			50.84	1.52	52.43	3.89	52.49	3.75	52.96	1.42
11+	52.66	1.59	52.87	1.45	49.04	9.07			50.83	2.07	51.62	1.48	49.91	5.73	54.03	1.51
12+	52.37	1.28	53.28	4.00	51.15	2.09			50.48	1.09	51.29	3.64	51.76	3.43	52.82	1.23
13+	52.05	1.47	52.17	1.66	51.25	1.02			50.57	0.64	51.23	1.44	51.14	1.69	52.61	0.66
14+	51.91	1.66	51.49	1.54	50.77	2.78			51.42	1.36	51.01	2.03	48.42	10.93	53.39	3.00
15+	51.89	1.86	51.95	1.91	51.72	1.56			49.55	1.41	50.51	2.01	51.36	1.53	52.46	1.61
16+	52.14	1.65	52.53	1.35	51.44	1.23			51.01	2.02	51.26	1.74	52.13	1.35	52.84	0.79
17+	52.15	1.65	51.95	2.26	51.03	1.73			50.34	1.23	50.94	2.51	51.69	1.36	53.04	1.61
18+	52.86	2.28	51.67	3.07	51.16	1.72			49.04	1.04	50.41	1.72	51.73	1.88	52.17	1.23
19+ & Above	52.51	1.53	52.35	1.63	50.06	2.23			49.19	1.57	50.09	1.25	48.63	9.86	52.78	1.61

36. Chest Index

Age (in years)	*Ladakh*						*Kashmir*		*Jammu*							
	Bodhs		*Baltis*		*Tibetans*		*Muslims*		*Gujjars*		*Dogra Brahmans*		*Dogra Rajputs*		*Dogra Scheduled Castes*	
	Mean	*S.D*	*Mean*	*S.D.*	*Means*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*	*Mean*	*S.D.*
8+	73.88	4.15	76.02	4.38	77.04	4.41			-	-	75.09	4.93	75.86	4.84	75.40	5.08
9+	74.27	5.46	76.41	3.13	77.54	5.12			72.25	2.67	77.18	3.90	76.97	4.56	74.67	5.25
10+	75.79	4.71	76.06	4.18	80.27	5.22			68.19	8.02	77.91	9.17	75.98	5.67	74.57	5.82
11+	74.93	4.62	76.26	4.23	79.67	4.32			73.27	4.85	75.98	5.03	75.24	5.32	75.29	4.35
12+	74.44	4.00	77.19	4.27	79.23	4.48			69.81	5.18	77.15	5.63	73.98	4.51	76.94	4.17
13+	75.24	3.38	76.83	3.59	75.06	9.20			68.57	9.35	74.77	5.91	76.55	4.38	75.55	5.73
14+	75.77	7.41	77.51	4.79	75.32	4.81			74.50	5.53	74.45	5.24	75.32	5.18	76.63	5.41
15+	77.09	6.15	77.64	4.61	76.11	6.74			72.47	3.24	76.47	5.12	72.77	5.79	75.68	6.38
16+	74.25	3.62	78.07	4.22	76.23	5.96			73.82	2.92	77.78	5.60	74.36	7.04	74.90	5.67
17+	73.63	3.60	77.24	3.69	76.56	6.04			72.82	2.06	74.99	6.06	74.27	5.70	75.19	5.34
18+	75.34	5.12	76.92	4.50	78.54	8.05			69.94	4.51	70.99	5.87	74.43	9.23	83.05	15.18
19+ & Above	77.04	4.28	75.60	6.06	79.41	4.93			69.14	10.32	74.76	6.53	77.43	6.18	73.74	5.97

Body Fat (Percentage)

At age group 8+ years Dogra Rajputs have the highest percentage of body fat followed by Dogra Brahmans. The Dogra Scheduled Castes and Tibetans have equal but less than their peers Dogra groups percentage body fat. Two Ladakhi groups namely Bodhs and Baltis have less percentage of body fat as compared to their peer groups from the state. In general there is an increase in percentage body fat with age. At 18+ Dogra Rajputs have the highest amount of body fat followed by Dogra Brahmans. Dogra Scheduled Castes and Tibetans come next in the order followed by Gujjars, Bodhs and Baltis. Among adults, again as in the case of younger children, Dogra Rajputs have the highest percentage of body fat followed by Dogra Brahmans, Dogra Scheduled Castes, Tibetans, Gujjars Baltis and Bodhs.

Body Surface Area

At age group 8+ years Tibetans have the highest body surface area followed by Dogra Rajputs, Dogra Brahmans and Dogra Scheduled Castes. Two Ladakhi groups have less body surface area as compared to their peers from the state. Body surface area continues to increase from 8+ to 18+ years of age. At 18+ years, various Dogra groups have the highest body surface area followed by Bodhs, Gujjars, Baltis and Tibetans in the order. Among adults Dogra Rajputs and Gujjars have the highest body surface area followed by Dogra Brahmans and the Dogra Scheduled Castes. Various Ladakhi groups record less body surface area than their peers.

Forced Vital Capacity

At age group 8+ years Dogra Scheduled Castes have the highest forced vital capacity followed by Dogra Rajputs, Tibetans, Baltis, Bodhs and Dogra Brahmans. At age group 18+ Ladakhi Bodhs have the highest value of forced vital capacity followed by Baltis and Tibetans. Various groups from Jammu region i.e., Dogras and Gujjars have lower forced vital capacity as compared to their Ladakhi peers. Among adults Ladakhi groups have slightly higher forced vital capacity as compared to their peers from the state. They are followed by Kashmiri Muslims, Gujjars and various Dogra groups.

Forced Expiratory Volume

At age group 8+ Dogra Brahmans and Baltis have higher FEV compared to their peers groups of the state. They are followed by Dogra Scheduled Castes, Tibetans, Dogra Rajputs and Ladakhi Bodhs. At age group 18+ various Ladakhi groups have significantly higher FEV than their peers from Jammu region. Among Jammu region population groups Dogra Brahmans have the highest value of FEV followed by Gujjars, Dogra Rajputs and Dogra Brahmans.

Peak Expiratory Flow

At age group 8+ years Baltis have the highest value of PEF followed by Bodhs. They are followed by various Dogra groups while the Tibetans record the lowest amount of PEF at age group 8+. In general PEF continues to increase with age. At age group 18+, Ladakhi Bodhs have the highest amount of PEF followed by Gujjars, Baltis, Dogra Rajputs, Tibetans, Dogra Scheduled Castes.

Body Mass Index

At age group 8+ Ladakhi Bodhs have the highest value of BMI followed by Baltis and Tibetans. Various Dogra groups record lower value of BMI as compared to their Ladakhi peers. With increase in height and weight the BMI continue to increase up to age group 18+. At 18+ Ladakhi Bodhs have the highest value of BMI followed by Dogra Rajputs, Dogra Brahmans, Tibetans, Baltis, Gujjars and Dogra Brahmans. Among adults, Tibetans have the highest value of BMI followed by Dogra Rajputs, Gujjars, Dogra Brahmans, Bodhs, Dogra Scheduled Castes and Baltis.

Samatotype Changes

The results of somatotype changes in adolescent years, as well as, in adults of various population groups of Jammu and Kashmir are presented in Table 3.

Endomorphy: For endomorphy no regular trend has been seen for Bodhs and Baltis of Ladakh. For Bodhs, maximum and minimum values of endomorphic component have been observed at 8+ and 15+ respectively. Whereas Baltis show

maximum values at endomorphy at 17+ years and minimum at 13+ years. No significant change like adolescent growth spurt has been observed in Bodhs and Baltis and Gujjars. Endomorphy shows a regular decrease in Tibetans, decreasing from maximum at 8+ to minimum at 18+ years. It has been observed that among the various groups of Dogras no regular trend has been observed. In Dogra Brahmans, endomorphy increases from 12+ to 15+ years and decreases thereafter, while in Dogra Rajputs increase is seen from 10+ to 13+ years, followed by subsequent decrements. In Dogra Scheduled Castes, endomorphy increases regularly from 8+ to 18+ years.

Mesomorphy: In Bodhs maximum and minimum values of mesomorphy have been observed at 8+ and 15+ years respectively, while in case of Baltis, maximum mesomorphic value has been observed at 8+ and minimum at 16+ years. No abrupt increase corresponding to adolescent growth spurt has been observed. Bodhs are more mesomorphic than Baltis throughout adolescent phase. In Tibetans the mesomorhpy decreases from 8+ to 13+ years and increases thereafter, except for a dip at 14+ years. In Gujjars, however, the mesomorphy increases regularly during adolescence. For Dogras, different trends have been observed for the three Dogra groups. In Dogra Brahmans and the Scheduled Castes, mesomorphy decreases from 8+ to 12+ years, whereas in Dogra Rajputs it shows more or less regular increments from 8+ to 14+ years. In Dogra Brahmans no regular trend has been observed 12+ years onwards. In Dogra Rajputs a regular increment is seen after 15+ years.

Ectomorphy: Like endomorphy and mesomorphy, no regular trend has been observed for ectomorphy in Bodhs, Balits and Tibetans of Ladakh and Gujjars of Jammu region. Bodhs show maximum value of ectomorphy at 17+ years and minimum at 18+ years respectively. Whereas for Baltis, maximum and minimum values of ectomorphy have been observed at 16+ and 8+ years respectively. Baltis are more ectomorphic than Bodhs at most of the yearly intervals. However ectomorphy decreases from 8+ to 11+ years and from 8+ to 13+ years for Dogra Brahmans and Rajputs respectively, while it shows increments for Dogra Scheduled Castes for the corresponding period. It increases from 12+ to 15+ years in Dogra Rajputs, while it decreases during the corresponding period in Dogra Brahmans. No change corresponding to adolescent growth spurt has been observed in somatotype components of Bodhs, Baltis, Tibetans, Gujjars and Dogra population groups of the state. Mean somatotype component vary in given order: First component is lower than the second while the third component ratings are higher than the first and the second components. In Tibetans all values lie in balanced ectomorph sector except at 13+ years where it lies in meso-ectomorphic sector. In Gujjars, all the mean values except at 9+ lie in meso-ectomorph sector whereas at 9+ years it lies in balanced ectomorph sector. In Dogras all the individual value lie in mesomorphic-ectomorphic sector.

Somatototype attitudinal distance (SAD) and Somatotype Dispersion Distance (SDD) have also been calculated for all the population groups (Table 3). In Bodhs the highest and the lowest values of SAD have been observed between 17+ to 18 + and 10+ to 11+ years, whereas for Baltis highest SAD has been observed between 14+ to 15+ years and lowest between 10+ to 11+ years respectively. The highest value of SDD for Bodhs lies between 17+ to 18+ years and for Baltis the highest value of SDD have been observed between 16+ and 17+ years. In Tibetans and Gujjars, the highest values of SAD have been observed at 13+ to 14+ and a year later respectively.

In order to quantify the changes between successive years for mean somatotype, the migratory distance (MD) has been calculated which is the sum of the SDDs between successive somatotype means from 8+ to 18+ years.

The Dards of Khaltse and the Bodhs of Changthang

As shown in Table 4 the Dard Bodhs weigh less than Baltis and Tibetans of Ladakh and Gujjars and Dogras of Jammu region of the state. They, however, show higher body weight than the Bodhs of Changthang. For height, Dard Bodhs were taller than Bodhs and Tibetans of Ladakh, Bodhs of Changthang but shorter than Baltis of Ladakh and Gujjars and Dogras of Jammu. For forced vital capacity (FVC), the Dard Bodhs show less value than the Ladakhi groups and Bodhs of Changthang but higher value than Dogras and Tibetans. For $FEV_{1.0}$, the Dards show higher value than the Bodhs of Changthang and Gujjars and Dogras of Jammu region (Table 4).

The Bodhs of Changthang weigh more than Tibetans of Leh and Gujjars and Dogras of Jammu.

Table 4: Anthropometric variables of Bodhs of Changthang and Dards of Ladakh, Jammu and Kashmir

S.No	Variables	Bodhs of Changthang		Dards of Ladakh	
		Mean	S.D.	Mean	S.D
1	Age (years)	32.55	12.93	32.93	11.58
2	Height (cm)	160.48	5.85	165.97	6.94
3	Weight (kg)	49.07	7.06	53.70	9.25
4	Forced Vital Capacity (litres)	3.81	0.91	3.65	0.78
5	Forced Expiratory Volume (litres)	3.09	0.69	3.16	0.47
6	Peak Expiratory Flow (ml/sec)	367.05	98.42	402.47	75.45
7	Height- Weight Ratio	30.54	4.12	32.32	4.65
8	Body Mass Index	19.04	2.59	19.49	2.40
9	Ponderal Index	44.55	1.78	44.67	1.68
10	Body Surface Area	1.48	0.11	1.58	0.15

In the case of stature also Bodhs of Changthang are shorter than Tibetans of Leh and Dogras of Jammu. Bodhs of Changthang also show higher value of various respiratory functions (viz. FVC, $FEV_{1.0}$ and PEF) than Ladakhis and Tibetans of Leh and Dogras of Jammu (Table 4).

DISCUSSION

As has been stated earlier that the growth potential of individuals is an outcome the interacton of their genetic make up and environmental factors. It has been reported in numerous studies that in order to achieve the genetic potential to the fullest, there have to be optimal support from environmental factors (Harrison et al., 1990; Falkner and Tanner, 1986). The environmental factors known to effect the growth process include good socio-economic factors, nutritional intake, disease and infection free environment, conducive psychological environment among others (Harrison et al., 1990).

As stated earlier the population groups of the state come from three distinct environmental zones, there are population groups like Dogras, who live at the lower altitudes and have, in general, better socio-economic status compared with Gujjars of the region and other population groups of the state. Gujjars, on the other hand, though poor are nutritionally known to be taking rich diet due to their engagement primarily into animal husbandry.

Among Dogra population groups, both Brahmans and Rajputs are economically better off than their Scheduled Caste peers though their work regime demands enormous physical exertion as they mostly work as agricultural labourers. The better economic status of both Dogra Rajputs and Dogra Brahmans is also reflected in their growth patterns.

Among Ladakhi group, again, as given above some interesting complexity of the genetical and environmental factors seems to be playing part in their ultimate body size. Both the Bodhs and Baltis seems to be living in the adverse climatic circumstances that include extreme and prolonged winter, severe shortage of pulses and fresh food for more than six months of the year among others. Another factor that seems to be playing an important part in their nutritional intake is less cash flow as compared to Tibetan refugees, who are mostly traders etc and have good cash flow. This affects their purchasing capacity which ultimately has a bearing on the nutritional intakes which in turn effect the growth process.

As has been documented elsewhere (Clegg et al., 1970, 1972), the population groups living at the high altitude have greater chest circumference and other measurements as compared to people living at the lower altitude. The same pheonomenon has been observed in the case of various Ladakhi population group during the present study. This probably has a origin in family sleeping in almost insulated form thereby giving in to oxygen deficiency popularly known as hypoxia (Baker, 1988).

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