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Variability In Human (Homosapien) Height Among The Students Of Government College, University, In District Hyderabad, Sindh, Pakistan

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Article Details

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ABSTRACT

When a person stands upright, their height or stature is measured from the bottom of their feet to the top of their head. Medically height is essential to maintain physical growth. Growth indicators such as the person's heights and (BMI) may be helpful to diagnose malnourishment. The present study was aimed to observed gender wise variations in students of different age groups. During the present studies the tall and dwarf character of male and female were collected. Around (100 samples) were collected under the (Umbrella of Government College, University, District Hyderabad, and Sindh, Pakistan). It was recoded that height is a quantitative or metric trait characteristic that has been measured by multiple factors. We observed that in which age how many heights is inherit, maximum student's height is tall around age range (19 to 25) and two or more than above (30 age) and few students are dwarf their age range between (21 and 22). Height has a strong correlation with genetic and other aspects of health and environmental basis. Research indicates that a shorter stature is associated with a higher life expectancy. This article explore role of height in genetics and how gene work and transmit their characters from parents to offspring respectively.

INTRODUCTION

Genetics play a key role in human heights and influential for short or tall heights but before pretentious just inheritance to deliberate height as their parents, other factors may also be considered. A stadiometer is used to measure heights (Stadiometers and Height Measurement Devices, 2014) in centimeters in the (SI) or metric systems (BMI-for-Age Growth Charts, 2014), (Math's World Year, 2009) and feet and inches used in the imperial or (US) customary units (Lapham, R. 2009), (Carter, P. J. 2008). In earlier anthropometric research evaluating nutritional status commonly associated to the genetic variations (Joerg, M. B. 2012). Scientists estimated individual's height by DNA sequence variations in eighty percent individuals as inherited but it is quite difficult to evaluate that, which genes may cause variations and affect heights. Blood pressure is also more likely to be lower in those who are smaller in size and less prone to because height has a strong correlation with other aspects of health, such life expectancy; it is also significant (Joerg, M. B. 2012). Additionally, people who are smaller in size are less likely to develop cancer and have lower blood pressure. According to research from the University of Hawaii, those with smaller bodies are more likely to have the "longevity gene" FOXO3, which lessens the consequences of aging (Science Daily, 2014). Being short lowers the chance of developing venous insufficiency (Tall height, 2020). Average height is often representative of communities that share environmental variables and genetic backgrounds. Gigantism or dwarfism, which are medical diseases brought on by particular genes or endocrine anomalies, can occasionally be the source of exceptional height variance (around 20% deviation from average) within such a community (Ganong, W. F. 2001). Human height development can be used as a gauge for two important aspects of welfare: health and nutritional quality (Baten, J. 2016). Even in the absence of any of these illnesses, environmental variables such as chronic malnutrition throughout infancy or adolescence may cause delayed development and/or significant reductions in adult stature in areas of poverty or conflict (Marill J. L. 2006), (Rishe, R.N. 2020). Few rare gene variants have melodramatic effects on height such as variations in the (FGFR3) gene may cause achendroplasia, an intermittent disorder characterized by short stature. More than seven hundred such type of gene variants discovered and expected more to be identified (Chao, Q. L. 2006). Researcher showed that in addition to the (FGFR3) genes, many other genes may involve in disorders that effects on heights such as such as (FBN1) genes cause disorders of Acromicric dysplasia, geleophysic dysplasia, and Marfan syndrome, genes (GH1) cause deficiency in growth hormones, genes (EVC) may cause Ellis-van craved syndrome, Weyers acrofacial dysostosis, and genes (GPC3) are associated in Simpson-Golabi-Behmel syndrome. Scientists are hopeful to know the different forms of such genes that affect height. In addition, genetic determinants, environmental factors may also affect height including nutrition during pregnancy, smoking, and exposure to hazardous substances. A healthy, well-nourished child may be taller than a child with malnourishment infectious diseases and insufficient health care's (Heightline, 2020).

About (60 to 80 %) of the difference in height between individuals is determined by genetic factors, whereas (20 to 40 %) can be attributing to environment effects, mainly nutrition. You may notice that boys grow slower than girls at first, due to differences in puberty milestones, overall though adult males tend to be an average of 14cm (5.5 inches) taller compared to adult female (Lango, A. H. *et.al*., 2010).

For tallness, variations in genes involved in bone growth and development can contribute to increased height. This gene can affect the production of growth hormones, the lengthening of

bones, and other factors that influence height (Chao, Q. L. 2006).
On the other hand, dwarfism is often caused by genetic mutations. That effect bones growth and development. This mutation can interfere with the production or function of growth hormones, resulting in shorter stature (Chao, Q. L. 2006).

It's important to note that height is a multifactorial trait, meaning it is influenced by both genes and environmental factors, nutrition, health and other external factors can also impact a person's height. Genes are not the only prognosticator of height in any individual. In many instances, child may be taller or shorter compare with their parents and relatives. [17]. Heights in human is a character of influence and purity between persons for generation. Many accept that level is a proper quality decided exclusively by qualities, various logical investigations have shown that one's actual height is impacted by different factors, like environmental, nutrition, hormones, and ailments. In present study, you will find out about the factors that influence level of development and how to expand your level at whatever stage in life possibly (Rogol, A. D. 2018). Several factors may influence a person's height which includes; environmental factors, DNA, hormonal, nutritional, living circumstances, genders and physical activities. The primary factor (DNA) is a decisive factor for height in any individual from parents to offspring. This may affect many features in person's height, weight, physical appearance, eyes and hair's color and intellectual characteristics (Yuksel, Y. 2022). The hormones display vital role in growth of human such as growth hormone. In childhood health complications may cause less production of growth hormones that affect person's height and treatment is recommended if noticed at an early age. Thyroid hormones also influence growth and on the other hand during puberty sex hormones such as testosterone and estrogen play momentous role in growth and development. Environmental factors also affect human height and influence growth and development. Many studies has proved that children in poor environmental conditions may not grow and possess less significant height. The poor diet and nutrition adversely affect growth and development. Living circumstances directly affects the normal height of male and female and those living in ideal circumstances are taller as compared from third world countries. The countries having inadequate healthcare structure and economic resources to fight for negative effects on physical, mental health and growth in human and significantly affects gender wise heights. Normally, worldwide males are taller than females mean height differences in adult male and an adult female is about (14 centimeters) and (5.5 inches). Worldwide during last (150) years, mean height has increased about 10 cm (3.9 inches). Studies indicated that mean human height is more commonly higher in developed countries due to physical and sports activities (Yuksel, Y. 2022).

MATERIAL AND METHOD

During the present research, with consent of female and male by keeping the ethical values the height of different samples collected from the Government College, University Hyderabad, Sindh, Pakistan. All parameters including: tall and dwarf were collected and measured in feet or inches. Samples collection was not gender specific and based on age.

RESULTS AND DISCUSSION

During the present studies around (100 samples) were collected from Government College, University, Hyderabad, Sindh and Pakistan. It was observed that in which age how many height is inherit, maximum student's height is tall in age range about (19 to 25) and two or more range above than (30 age) and few students are dwarf their age range between (21 and 22) respectively.

FEMALE POPULATION DISTRIBUTION

The "Tall" group was significantly more predominant, comprising about (38 individuals), compared to only 12 in the "Dwarf" (Table.1). This indicated that the majority of female population falls within the taller height group, suggesting that more individuals might be representing the average phenotype in specific demographic.

AGE WISE PARAMETERS:

MEAN AGE AND STANDARD DEVIATIONS OF MALES

The Mean age for "Tall" individuals was recorded higher as compared to mean age years for "Dwarf" individuals (Table.2 and Fig.2). These variations suggested that age has a limited impact on the distribution of height in both categories within the individuals. The standard deviation was recorded in the "Tall" group is (2.01) years as compared to (1.16) years for the "Dwarf" group. (Table.2) The standard deviation suggested that the ages of tall individuals were more widely spread with few older age males that contributed wider age range of this group.

AGE RANGE DISTRIBUTIONS

The age ranges in the "Tall" group of male individuals was recorded from (19 to 38) years, exhibited a more diverse group. In contrast, the age range of "Dwarf" group was narrower, s from (21 to 22) years. This indicated that less variability in the age distribution of the "Dwarf" group. (Table.2)

AGE WISE PARAMETERS

MEAN AGE AND STANDARD DEVIATIONS

The average age for "Tall" individuals was recorded slightly higher as compared to mean years for "Dwarf" individuals (Table.1 and Fig.1). This minor difference suggested that age has a limited impact on the distribution of height in both categories within the individuals. The standard deviation was recorded in the "Tall" group is (2.01) years as compared to (1.16 years) for the "Dwarf" group. (Table.1) This higher standard deviation suggested that the ages of tall individuals were more widely spread, with few older individuals contributed the broader age range of individuals.

AGE RANGE DISTRIBUTIONS

The age range of the "Tall" group of individuals recorded from (19 to 32) years reflected a more diverse group of samples. In dissimilarity, the age range of "Dwarf" group was narrower, s from (20 to 23) years. This was indicated that less variability in the age distribution of the "Dwarf" group (Table.1)

MEAN HEIGHT AND STANDARD DEVIATIONS

MEAN HEIGHT

The mean height of "Tall" group of individuals was recorded as 62.37 inches (5 feet 2 inches), and it was significantly higher than the mean height of "Dwarf" group of individuals at (57.67) inches (4 feet 9 inches) (Table.1 and Fig.1). This difference highlighted the dissimilar height limit used for individual groups. The standard deviation of height in the "Tall" group was recorded as (2.57) inches, indicated a broader banquet of heights. Whereas, in "Dwarf" group of individuals the standard deviation was recorded (0.98) inches, reflecting a strongly grouped height distribution (Table.1)

HEIGHT RANGE

The height range for "Tall" individuals spans from (60 inches) and (5 feet) to (71 inches) and (5 feet 11 inches), showing a broader variability in height. Conversely, the "Dwarf" group has a

narrow height range of (56 inches) and (4 feet 8 inches) to (59 inches) and (4 feet 11 inches), indicating a more consistent height pattern within this category (Table.1).

The analysis highlights significant differences in age and height distributions between the "Tall" and "Dwarf" groups. The "Tall" group of individuals not only has a significant larger population but also established greater variability in both age and height. On the other side the individuals of "Dwarf" group found smaller in size, exhibited more steadiness in age and height ranges. These findings suggested that tall height was more common in the individuals, with a varied age and height profile, while dwarf stature represented with a smaller, extra homogenous subset of the population. This difference could be influenced by genetic, environmental, or nutritional factors, warranting further exploration to identify underlying causes.

TABLE NO: 01. IS SHOWING TOTAL COUNT, MEAN AGE, MEAN HEIGHT WITH STANDARD DEVIATIONS AND AGE RANGE OF TALL AND DWARFISM FEMALES COLLECTED FROM GC UNIVERSITY HYDERABAD

Category	Total Count	Mean Age (years)	Std Dev Age (years)	Age Range (years)	Height Range (inches)	Mean Height (inches)	Std Dev Height (inches)
Tall	38	21.68	2.01	(19-32)	(60-71)	62.37	2.57
Dwarf	12	21.08	1.16	(20-23)	(56-59)	57.67	0.98

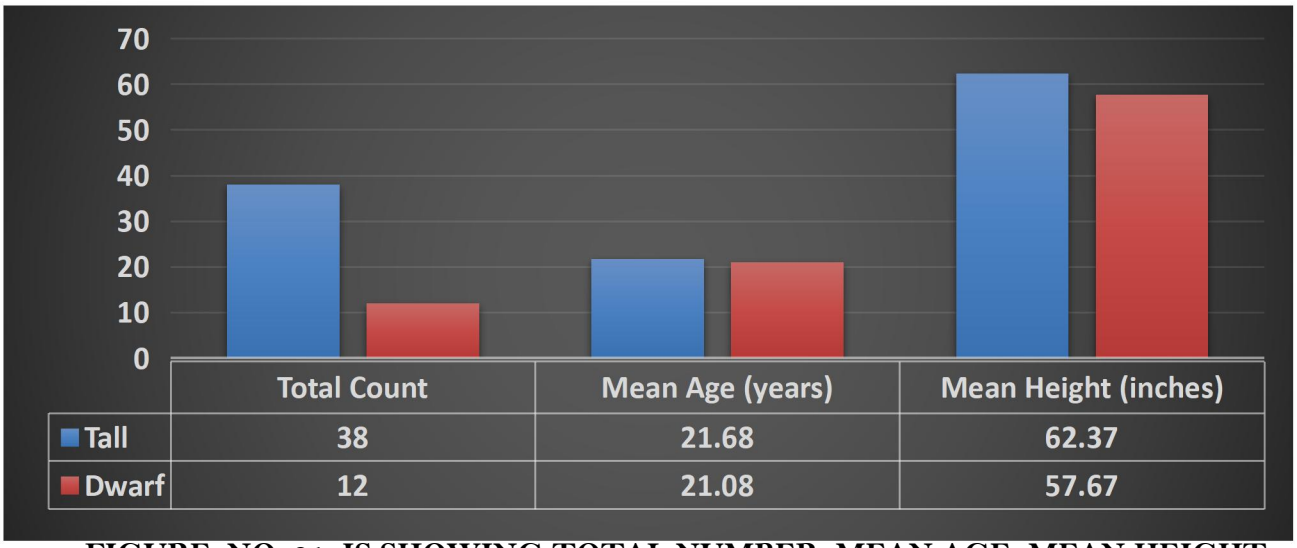


FIGURE: NO: 01. IS SHOWING TOTAL NUMBER, MEAN AGE, MEAN HEIGHT AND AGE RANGE OF TALL AND DWARFISM FEMALES COLLECTED FROM GC UNIVERSITY HYDERABAD, SINDH, PAKISTAN.

MALE POPULATION DISTRIBUTION

The individuals in "Tall" mate category was significantly much more predominant out of total number comprising (48 male individuals), compared to just 02 in the category of "Dwarf" (Table.2) This showed that the most of the male population falls within the category of taller height, suggested that more individuals might be average phenotype in diverse demographic.

AGE WISE PARAMETERS

MEAN AGE AND STANDARD DEVIATIONS OF MALES

The Mean age for "Tall" individuals was recorded higher as compared to mean age years for "Dwarf" individuals (Table.2 and Fig.2). These variations suggested that age has a limited impact on the distribution of height in both categories within the individuals. The standard deviation was recorded in the "Tall" group is (2.01) years as compared to (1.16) years for the "Dwarf" group. (Table.2) The standard deviation suggested that the ages of tall individuals were more widely spread with few older age males that contributed wider age range of this group.

AGE RANGE DISTRIBUTIONS:

The age ranges in the "Tall" group of male individuals was recorded from (19 to 38) years, exhibited a more diverse group. In contrast, the age range of "Dwarf" group was narrower, s from (21 to 22) years. This indicated that less variability in the age distribution of the "Dwarf" group (Table.2)

MEAN HEIGHT AND STANDARD DEVIATIONS IN MALES

MEAN HEIGHT

The mean height of "Tall" group was recorded as 66.25 inches and it was recorded higher than the mean height of "Dwarf" group of at (65 inches) (Table.2 and Fig.2). This difference showed the narrow dissimilarity in the height limit between groups. Hence the standard deviation of height in the "Tall" and "Dwarf" group of individuals was also recorded with narrow difference (Table.2)

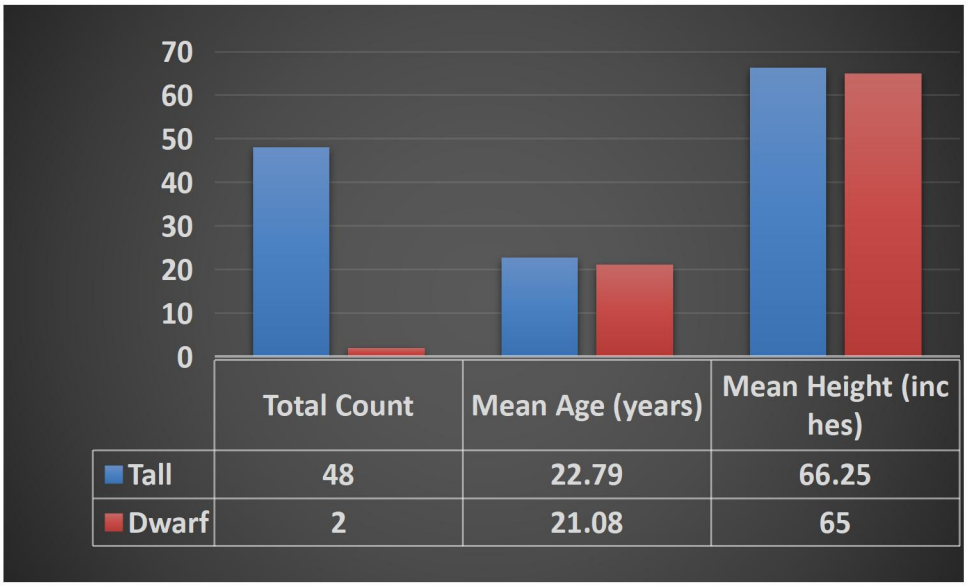
HEIGHT RANGE

The height range for "Tall" individuals was recorded as (62 inches to 71 inches) displayed a broader variability in height and in the "Dwarf" group has a narrow height range of 64 inches to 66 inches, indicated a less variability (Table.2)

The analysis in present study exhibited narrow differences in age and height distributions between the "Tall" and "Dwarf" groups, but also established greater variability in the range of age of Tall group males. On the otherside, the individuals of "Dwarf" group found more steadiness in age and height ranges. These results suggested that mean height and age were more common between both groups. This variance could be influenced by many factors such as genetic or nutritional factors.

TABLE NO: 02. SHOWING TOTAL COUNT, MEAN AGE, MEAN HEIGHT WITH STANDARD DEVIATIONS AND AGE RANGE OF TALL AND DWARFISM MALES COLLECTED FROM GC UNIVERSITY HYDERABAD

Category	Total Count	Mean Age (years)	Std Dev Age (years)	Age Range (years)	Height Range (inches)	Mean Height (inches)	Std Dev Height (inches)
Tall	48	22.79	3.61	(19-38)	(62-71)	66.25	2.05
Dwarf	2	21.08	0.7	(21-22)	(64-66)	65	1.41



	Total Count	Mean Age (years)	Mean Height (inches)
Tall	48	22.79	66.25
Dwarf	2	21.08	65

FIGURE: NO: 02. IS SHOWING TOTAL NUMBER, MEAN AGE, MEAN HEIGHT AND AGE RANGE OF TALL AND DWARFISM MALES COLLECTED FROM GC UNIVERSITY HYDERABAD.

PHOTOGRAPH: 1 AND 2. SHOWING COLLECTION OF DATA AT GOVERNMENT COLLEGE, UNIVERSITY, DISTRICT HYDERABAD, AND SINDH, PAKISTAN.

CONCLUSION

Around (100 samples) we were collected from Government College, University Hyderabad, Sindh, Pakistan. It was observed that maximum height is inherited is tall age range is (19 to 25) and two or more than above (30 age) and few students are dwarf their age is (21 and 22). This study first time done at the Government College, University Hyderabad, Sindh, Pakistan to see role of height in genetics.

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