PREDICTIVE HEIGHT FROM ULNA LENGTH OF THE MEDICAL STUDENTS OF GAJJU KHAN MEDICAL COLLEGE USING MUST EQUATIONS

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ABSTRACT

Objective: *To assess the height of the medical students of Gajju khan medical college using MUST equations for predicting height from the length of the ulna.*

Materials and Methods: *Cross sectional descriptive survey was piloted in Gajju Khan Medical College Swabi from March 2019 to May 2019. Informed verbal consent was taken. Students present on the day of the interview included. Height of students and length of the ulna was measured and using MUST equation predicted height was calculated. Data were analyzed with an online Google form.*

Results: *Out of total two hundred and sixteen students (216) participated in the study, of which 128 (59.25%) were female and 88 (40.74%) were male respondents. A strong association was found between actual height and ulna length in male medical students while a moderate positive relationship was found in females. There was a difference of 8.2 and -1.3 in predictive and actual height by using MUST equation.*

Conclusion: *It is concluded that there is a strong association of ulna length and actual height in males and a moderate association in female students.*

Keywords: *Actual height, ulna length, predictive height*

INTRODUCTION

Screening for nutrition status plays a pivotal role in identifying and taking action for the prevention of malnutrition in the community.[1] A Variety of screening tools are either used alone or in combination like clinical, dietary, biochemical, or anthropometrical to assess the nutritional status of the community.[2] Measurement of the physical dimensions of the body is more accurate as it is an objective indication of the nutritional status.[3] The commonly used parameter is height and studies have been done to predict the height of a person through various means, like knee height, arm span, and ulna length. The ulna length was used in 18-28 years and less than 65 years. Prediction of height was formulated using MUST (Malnutrition Universal Screening Tool) where actual height was not available.[4-6]

It is well documented that any anthropometric measurements are affected by a lot of variables like sex, age, education, region-wise, ethnicity, and socioeconomic status likewise arm span and height are equal in the White population but are more than height in Black Africans and Asians people.[7, 8] The MUST equations describing the relationship between ulna length and height have been published and

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studies have used it to predict the height in diverse group.[9, 10]

The current survey aim was to assess the height of the medical students of Gajju khan medical college using MUST equations for predicting height from ulna length.

MATERIALS AND METHODS

This Cross sectional descriptive survey was piloted in Gajju khan medical college Swabi from March 2019 to May 2019. The Survey was conducted after ethical approval from the institute ethical Committee. The medical students of first, second and third year classes who were willing to participate in the study were included in the survey. The college is newly established so 4th and final year classes were not present. Those who were absent on the day of the interview, the student with a congenital lesion of the forearm and the student with injuries of the forearm, were excluded from the study population. Informed verbal consent was taken before data collection. The sample was 216, using the convenience sampling technique.Anthropometric measurements like the height of students and their ulna length were measured by the researcher himself assisted by other members and recorded on a pre-designed questionnaire. Markings were made on the wall with a nonstretchable measuring tape, the students were requested to remove shoes, to amend hairstyle that can affect the readings. They were instructed to stand upright, facing forward with arms hanging freely by the side with palms towards the thigh, legs close together, buttocks and upper back touching the wall. The head should be in the "Frankfort plane". Before measurement the participants were instructed to take a deep breath to straighten the spine, eyes looking straight ahead and measurement to the nearest 0.1 cm was done.[9]

Ulna length was measured by a non-stretchable measuring tape, the students were instructed to take off any wrist watches and jewelry. The left arm was put across the chest diagonally with palm directed internally and the tip of fingers pointing towards the opposite shoulder. Then ulna was measured from the tip of the olecranon process to the tip of the styloid process to the nearest 0.1 cm11, 12 The MUST equation was used as its use is validated for the left arm.[10-12]

MUST equation was used to calculate the height which has been developed for adults aged less than 65 years.[13,14,18,19]

Males: Predicted height (cm) = 79.2 + [3.60 x ulna length (cm)]

Females: Predicted height (cm) = 95.6 + [2.77 x ulna length (cm)]

Data was analyzed on online Google sheets. Categorical data were presented in the form of

Frequencies, percentages, mean and standard deviation. The correlation was calculated by "r" value where 1 is a positive correlation relationship.

RESULTS

Two hundred and sixteen students participated in the survey out of which, 128 (59.25%) were female and 88 (40.74%) were male respondents. The average age was 21 and 20 years for females and males respectively (Table 1). The actual height was 164.4 cm and 164.7 cm for males and females while predictive height was 172.8 and 163.4 cm respectively and ulna length was 25.9 cm (male) and 24.4 cm (female).

A strong association was found between actual height and ulna length in male medical students while a moderate positive relationship was found in female students (Figure 1). The difference between predictive and actual height was more in male students as compared to female students (Table 2).

DISCUSSION

The current survey aimed to assess the height of the medical students of Gajju Khan Medical College using MUST equations for predicting height from ulna length. Our survey revealed that there is

Table 1: Age, actual height and ulna length by sex in medical students (n=216)

	Age (years)	Actual height (cm)	Ulna length (cm)
	Mean (SD)	Mean (SD)	Mean (SD)
Male	19.6 (0.9)	164.4 (7.3)	25.9 (1.6)
Female	20.8 (0.8)	164.7 (5.3)	24.4 (1.4)

Table 2: Correlation of actual height and ulna length, the difference of predictive and actual height by sex in medical students (n=216)

	Correlation of Actual height and ulna length	Predictive height	Difference to predictive height and actual height
	r	Mean (SD)	
Male	0.71	172.6 (5.8)	8.2
Female	0.62	163.4 (3.9)	-1.3

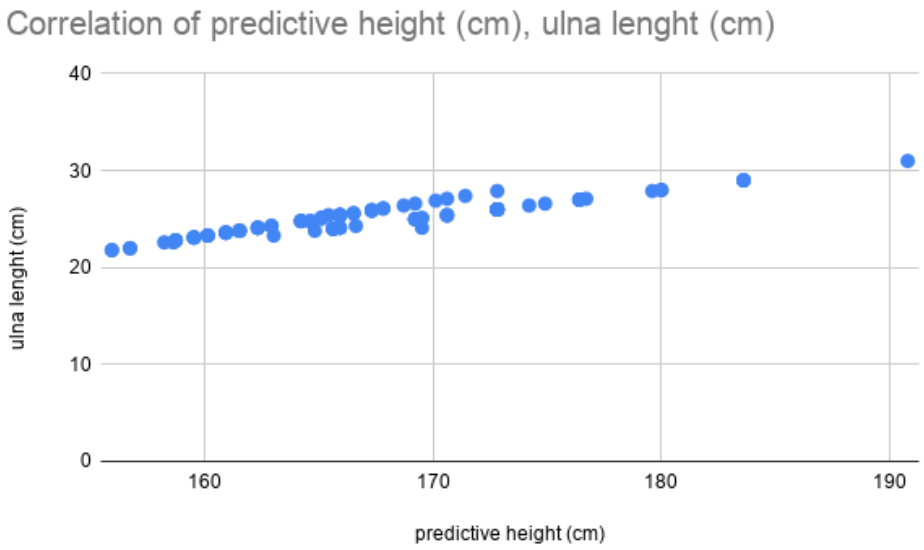

FIG 1: Correlation of predictive height and ulna length in medical students (n=108)

a definite association between the length of the ulna and the height of medical students between 19-21 years including both male and female students. It is a precise research tool to calculate the height of individuals where it cannot be measured. Compared to previous research that concluded that ulna length and actual height of individual may not be associated in Asian population while this study has association.[14] The Ulna is palpable under the skin and its length measurement is an easy and practical tool to assess the nutritional status of the community.[15-17]

Our findings revealed that the actual height of males was less than predictive height, it could be due to a lot of factors like environmental, socio-economic, and food habits. But it was opposite for females ie actual height was more than predictive height which could be because of small sample size or selection bias.

CONCLUSIONS

It is concluded that there is a strong association with ulna length and actual height in males and a moderate association in the females' population. There is a difference of 8.2 and -1.3 in predictive and actual height by using MUST equation.

LIMITATION

The partakers of the current investigation were small sample size in comparison to anthropometrical researches done elsewhere enrolled larger population. The medical students are not true representatives of the whole community therefore generalization of the study should be made with caution. But this research is a pilot study for policymakers for inclusion of MUST equation for nutrition screening of general population.

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