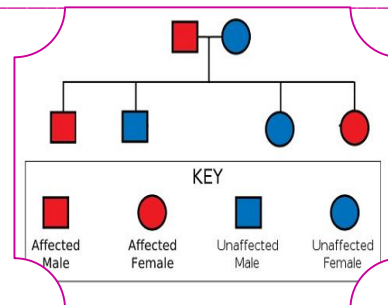




SURVEY OF FEW MENDELIAN TRAITS FROM THE POPULATION OF SELECTIVE COASTAL VILLAGES OF TIRUCHENDUR

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ABSTRACT

The objective of this survey is to create awareness among the people about genetically inherited characters. Mendelian traits such as shape & colour of the hair, body hair, skin colour, white forelock, baldness, eye colour, ear lobes, nature of lip, size of the eye, size and shape of the foot were analysed from the individuals of coastal villages around Tiruchendur, Thoothukudi District. During the survey, the research team discussed with common people about their genetical characters and hereditary diseases. People were advised to avoid marriage between close relatives and before marriage each one must get medical report from authorities.

KEYWORDS: John Gregor Mendel, *Pisumsativum*, White forelock, Ear lobe, Albinism, Hereditary diseases, Tongue rolling.

INTRODUCTION:

Many human traits follow Mendelian inheritance predictions. A number of human inheritance traits are as below. They are controlled by a single gene that has two alternative alleles. In each, one allele is dominant and another is recessive. Genotype is the specific combination of alleles inherits from parents. It can be homozygous dominant, heterozygous or homozygous recessive.

Gregor Mendel is called the father of modern genetics because his experiments with *Pisumsativum*, a common pea plant gave us the insights to study of genetic patterns of inheritance. He used statistical analysis of large populations to identify the possible expressions of basic genetic traits.

His observations led to laws regarding the transmission of hereditary characteristics from generation to generation. Most of the concepts from his observation still hold true today.

Man is not a favourable subject for studies of inheritance because, member of the human race are genetically diverse and they are heterozygous for many genes and there are wide variations in their physical, biological and social environments.

MATERIALS AND METHODS

Collection of Data by Survey Method: Mendelian phenotypic traits of human were collected by a detailed survey with the help of inheritance.

Table 1: Mendelian Phenotypic traits in Human

S.No	Features/ Traits	Dominant trait	Recessive trait
1	Shape of the hair	Curly	Straight
2	Colour of the hair	Black	Brown
3	Body hair	Abundant	Little
4	Early Baldness	Present	Absent
5	White forelock	Present	Absent
6	Pigmentation	Present	Absent
7	Skin colour	Black	White
8	Eye colour	Black/ Brown	Gray/ Hazel
9	Ear lobes	Free	Attached
10	Nature of lip (Broad/ Narrow)	Broad	Narrow
11	Size of the eye	Large	Small
12	Length of the eyelash	Long	Short
13	Size of the nose	Broad	Narrow
14	Shape of the nose	Roman nose	Straight
15	Tongue rolling	Rolling	Non rolling
16	Widows peak	V shaped	Curve shaped
17	Dimple cheek	Present	Absent
18	Dimple chin	Present	Absent
19	Mid digital hair	Present	Absent
20	Shape of the foot	Arched	Flat

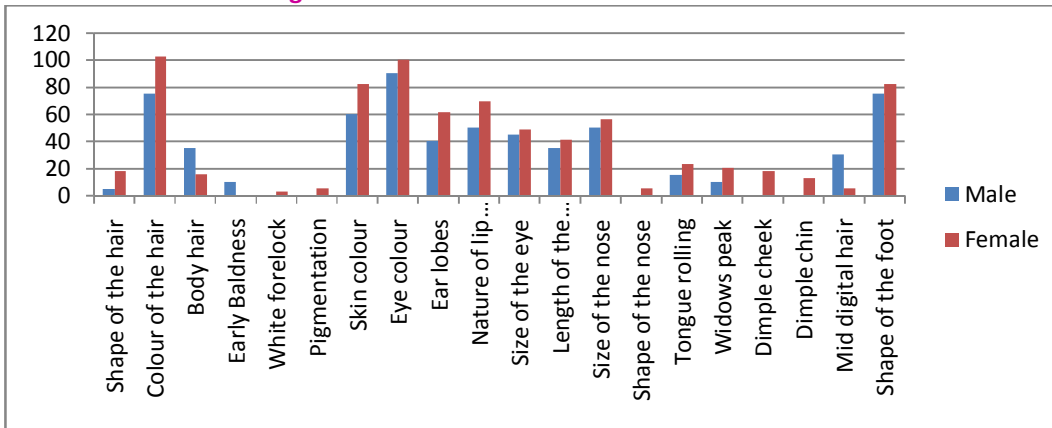
This survey of Mendelian traits observed from nearby villages in the coastal areas of Tiruchendur. It was collected from 14 villages such as Amali Nagar, KayalPatnam, Manapadu, Mathimanvillai, Adaikalapuram, KandasamyPuram, Kayamozhi, Thoppur, KandasamyPuram 1, Sundankottai, Pitchivillai, Vannimanagaram, Tiruchendur and Arumuganeri. From each village the Mendelian traits were observed from 25 families. Two and three generations have been observed from each family.

RESULTS:

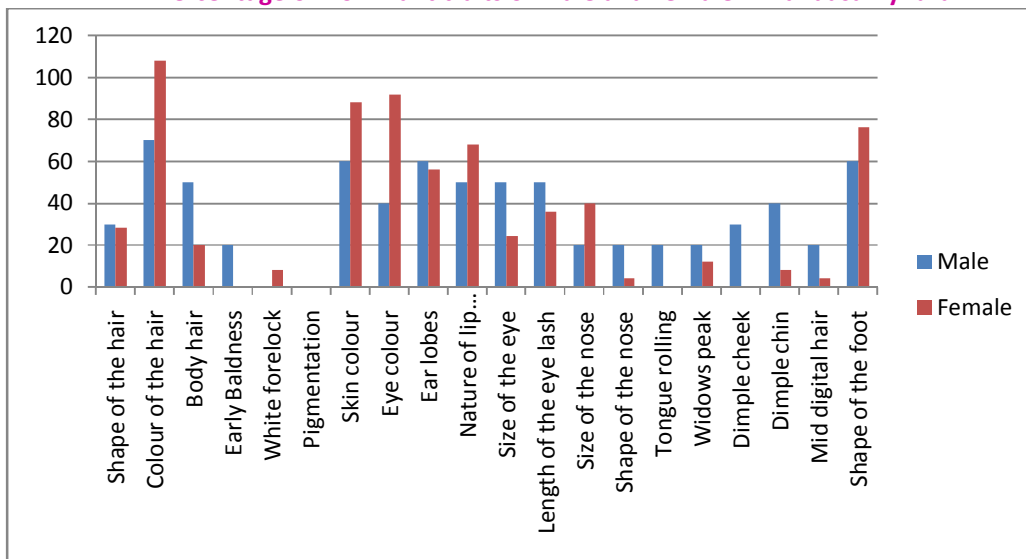
The present studies investigated that the inheritance of Mendelian traits and some hereditary diseases among the human population residing in the coastal areas of Tiruchendur Taluk, Thuthookudi District, Tamil Nadu and the data were analysed statistically.

In all characters, most of the individuals exhibit dominant characters. The results represented in the graphically.

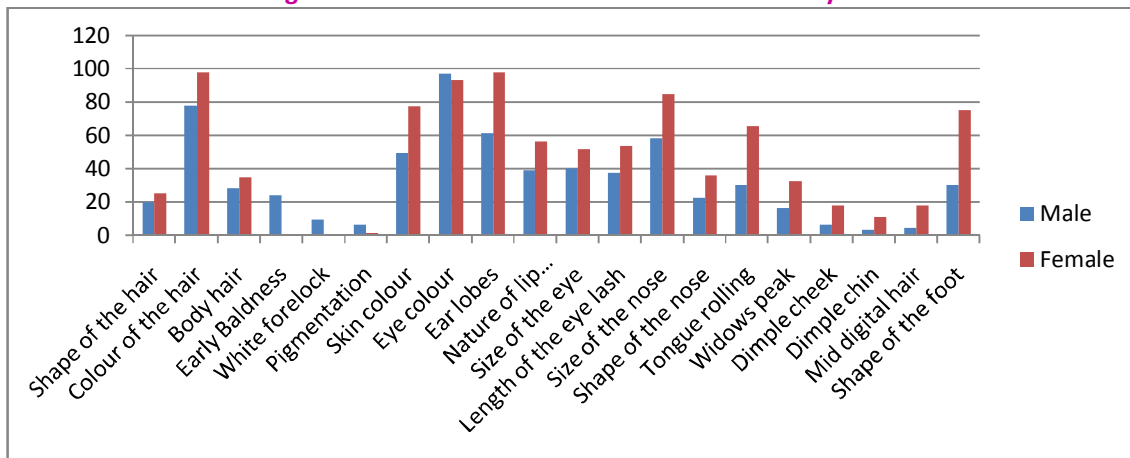
Percentage of Dominant traits of male and Female in Mathimavillai



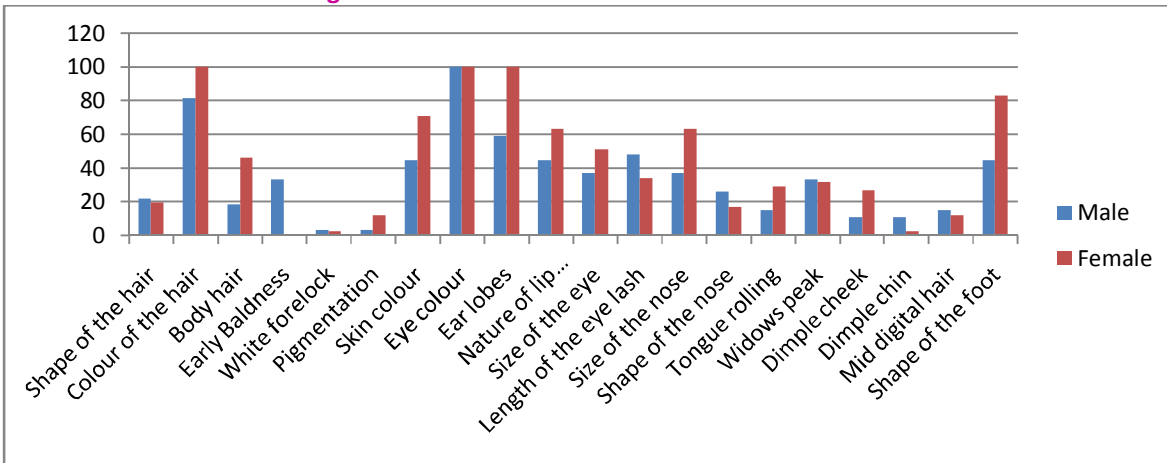
Percentage of Dominant traits of male and Female in KandasamyPuram



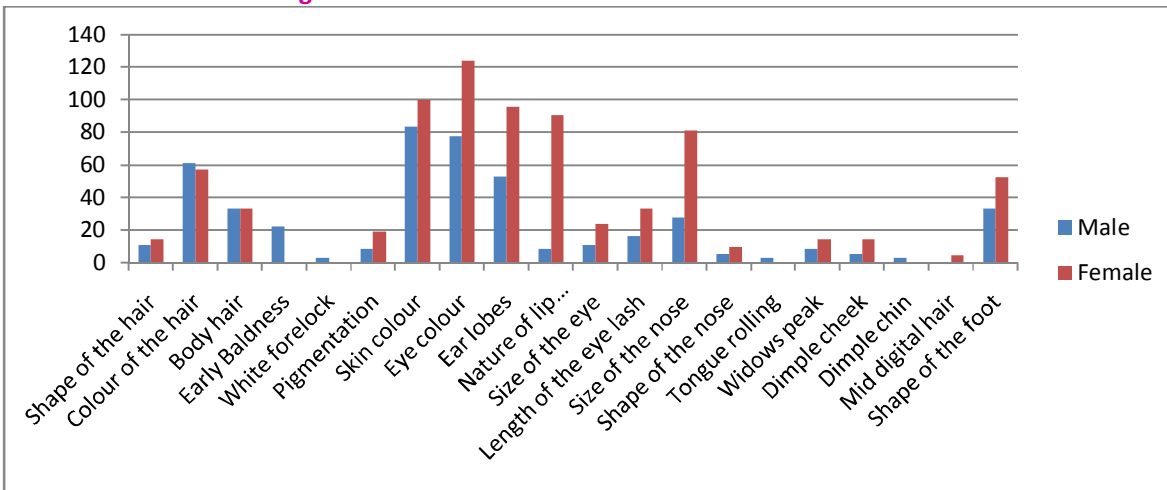
Percentage of Dominant traits of male and Female in KayalPattinam



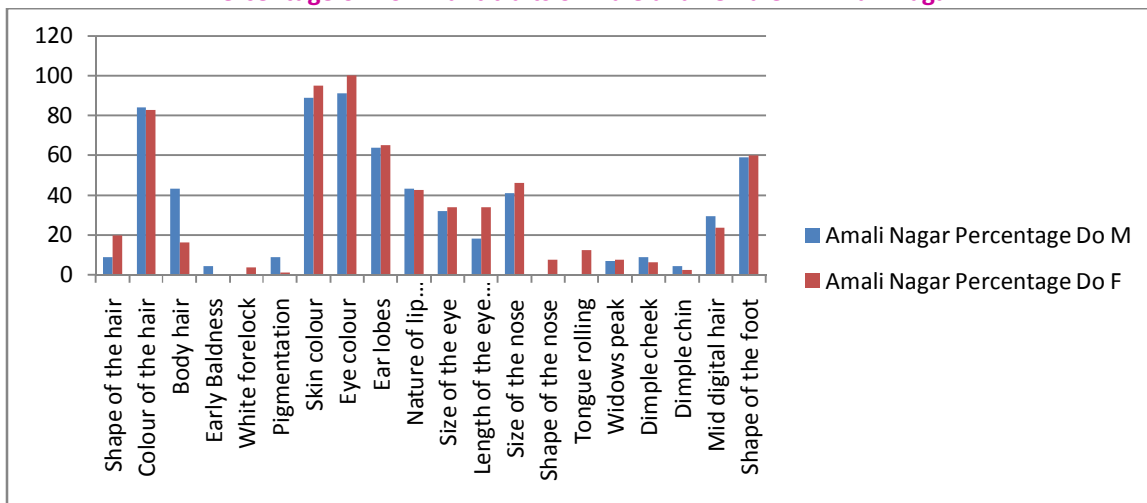
Percentage of Dominant traits of male and Female in Pitchivillai



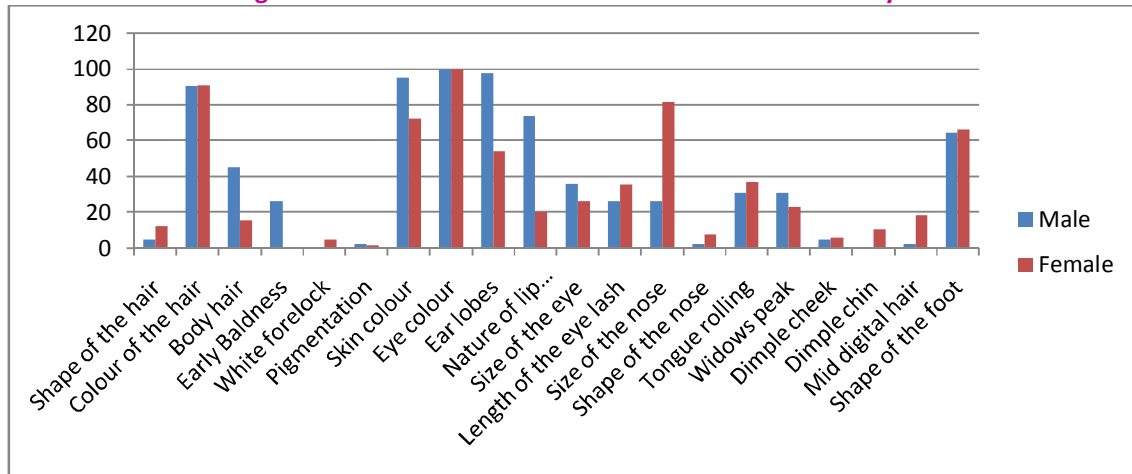
Percentage of Dominant traits of male and Female in AdaikalaPuram



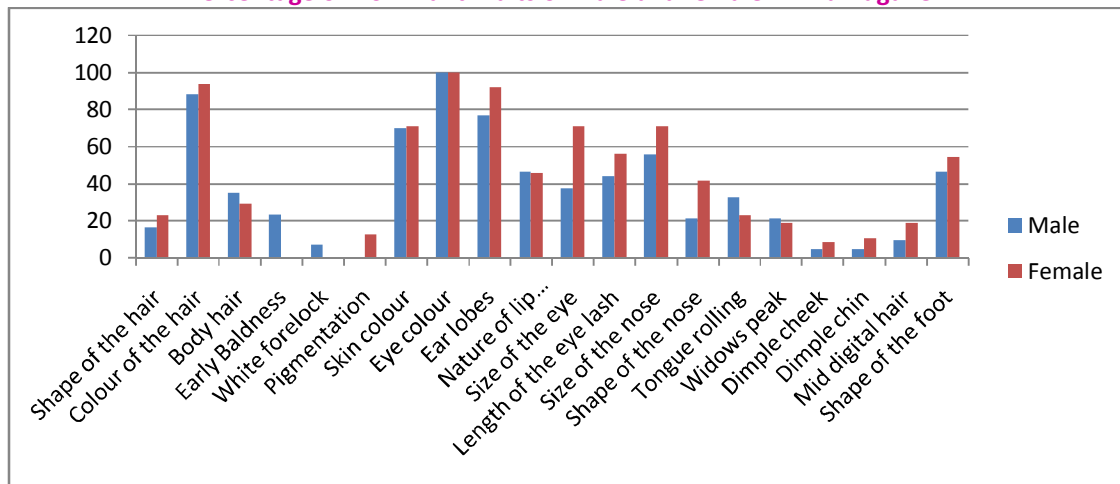
Percentage of Dominant traits of male and Female in Amali Nagar



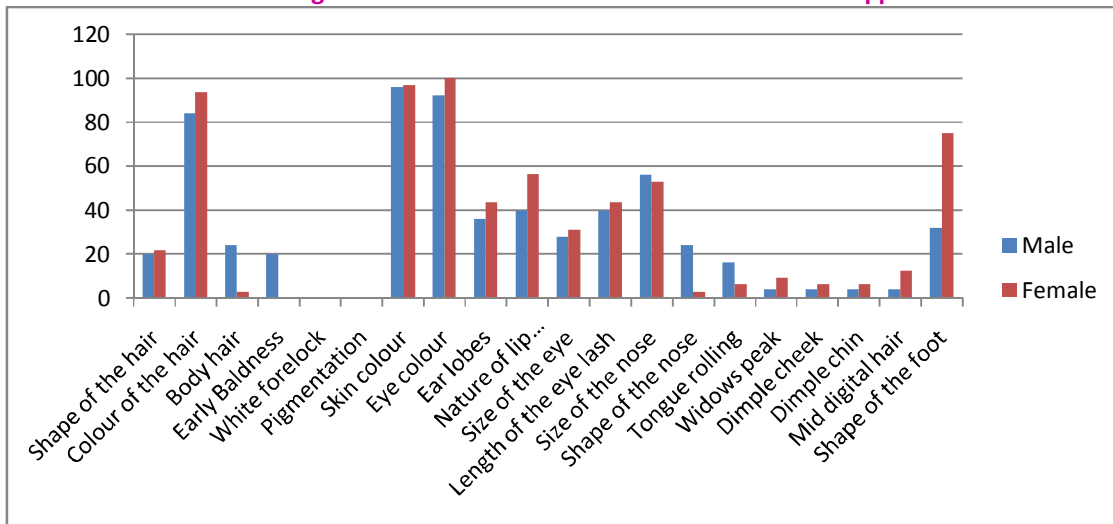
Percentage of Dominant Traits of male and female in KandasamyPuram 1



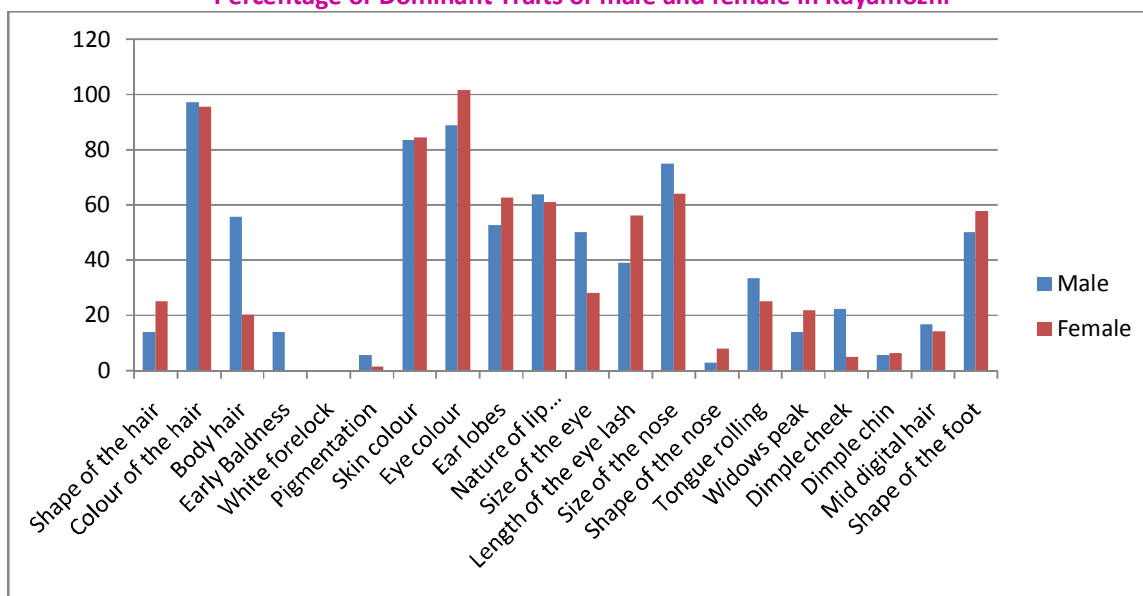
Percentage of Dominant Traits of male and female in Arumuganeri



Percentage of Dominant Traits of male and female in Thoppur



Percentage of Dominant Traits of male and female in Kayamozhi



DISCUSSION

The present study revealed that different forms of hair shape were observed among the participants such as curly hair, wavy hair and straight hair. The percentage of straight hair is greater than the wavy and curly hair. In 2009, Mengel-From reported that the hair colour is associated with five different genes such as *MC1R*, *KITLG*, *TYR*, *OCA2* and *SLC45A2*.

Albinism is one of the archetypal inborn errors of metabolism. According to Archibald Garrod, the frequency of skin colour is rare and it around 1:20,000. It is usually defined as a congenital hypopigmentation of the skin, hair, or eyes (King *et al.*, 2001). In the present study most of them have black hair due to dominant gene.

The incidence of tongue rolling of the study sample was high when compare with Ekpoma, Nigeria and Bihar, India with 100(51.8%) roller, 93(48.19%) non roller and 344(93.48%) roller 24(6.52%) non roller respectively that show dissimilarity with current study (Nwaopara *et al.*, 2008; Bulliyya, 2003). Nigerian Urhobo and Karcharis of Assam India showed similarity with present study and observed more female were tongue roller with the ratio of 48 and 32(35.6%) then the male 39 and 34(27.2%) respectively (Onyije, 2012; Pandey *et al.*, 2013).

This delightful facial feature is usually a genetically-inherited trait. However, people born without natural dimples can successfully imitate their appearance through a variety of methods ranging from the simple (makeup) to the drastic (surgery) must be interesting to note that dimples are inherited facial traits that are passed from one generation to the next. Dimples often occur on both the cheeks (Khuo, 1962). A single dimple on one cheek is a rare phenomenon. Dimples on cheeks enhance facial beauty and expression. They occur in both sexes with no particular preponderance, may express unilaterally or bilaterally and are genetically inherited as a dominant trait (Argamaso, 1971; Pentozos Daponte *et al.*, 2004). Anatomically, dimples are thought to be caused by a double or bifid zygomaticus major muscle, whose facial strands insert into the dermis and cause a dermal tethering effect (Pessa, 1998; Gassner *et al.*, 2008).

Kalia and Gupta (1978) had observed higher incidence of free ear lobes (73.84%). The frequency of free earlobes was found to be in the range of 56% to 74% in five endogamous groups of Haryana by Yadav *et al.*, (2000). Out of 360 offsprings used 74.17% had detached earlobes while 25.83% had attached earlobe in the ratio of 3:1.

In the present study free ear lobe is predominant.

In the present investigation on the mid digital hair on the coastal villagers informed that the presence of hair on the phalanges is considered as dominant trait. Accordingly the highest percentage of this dominant trait was observed in male than the female sex. This may be due to the genetical factor as supported by the findings of Bernstein and Burks (1942) revealed that the hairiness was determined by Sallellic genes (A0, A1, A2, A3, and A4).

CONCLUSION:

The present study suggests that Government should bring the awareness and also educate the public at large regarding hereditary and acquired genetic conditions. We found the public of visited villages possess only a very basic knowledge and understanding about their health conditions. The awareness programme can be started in the schools and colleges. The Government should take some steps to advance the health of public by investigating the impact of genetics on the causes and treatment of diseases. The people must avoid closely related marriages. If it continues, the dominant gene pool may reduce and also younger generation may get the recessive characters. Government should take measure to prevent these genetical diseases.

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