

**RESPIRATORY FUNCTION, BLOOD PRESSURE AND
NUTRITIONAL STATUS AMONG THE MONPAS OF
HIGH ALTITUDE TAWANG, ARUNACHAL PRADESH**

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CHAPTER V

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SUMMARY AND CONCLUSION

As the title of the thesis implies, the present study is made among the Monpas of Tawang district of Arunachal Pradesh.

The Monpas are a major ethnic group of Arunachal Pradesh. They are considered as one of the most prominent tribes of the state. They are the inhabitants of the high altitude Tawang district and the mountain passes of Bomdila in West Kameng district. The Monpas speak Tshangla, which is also understood by the Bhutanese and Tibetans as these languages share a similar origin.

The present study is made under three parameters- respiratory function test, blood pressure measurement and nutritional status of the Tawang Monpas.

As the first interface between environment and human body, lungs play a vital role in oxygen exchange. Among various investigating modalities available, pulmonary function tests are an invaluable tool for assessment of lung function (Vijayasekaran et al., 2003). Pulmonary functions are influenced by anthropometric, environmental, genetic, ethnic, socio-economic and technological variation (Anudhakar et al., 1985). Pulmonary function test were carried out using Helios 702 Spirometer (manufacturer: Recorders and Medicare System Pvt. Ltd). Three readings were recorded- Forced Vital Capacity (FVC), Peak Expiratory Volume in one second (FEV1) and the ratio of FEV1/FVC. Side by side anthropometric

measurements were also taken like Height and Weight. The mean age of the population is 31.41 years. The mean ratio of FEV1/FVC recorded, shows the distribution of population in the normal range of spirometry test. 80% (99.6% for male and 97.22%) of the total population are in the category of normal (According to American Thoracic Society). The ratio obtained from the study show that the population have normal pulmonary features. Among the males the relationship between BMI and FVC, FEV1 and FEV1/FVC suggests that there exist a negative relationship though this is of very lower magnitude. While among the females the relationship between BMI and FVC suggests that there exist a positive relationship though this is of very lower magnitude. But among the BMI and FEV1 and FEV1/FVC there exist a negative relationship between BMI and FEV1/FVC. Bhasin and Singh (1990) in a study of lung function and their correlation with height and weight among the Dogras of Jammu and Kashmir reported that different pattern of growth observed for height vertex and body weight may be due to 'localized morphological adaptations.' The study suggests that since the Monpa population lives in the same physical environment for a quite long time; these differences may also be due to their genetic makeup. Regarding the data of respiratory parameters the study concludes that a significant relationship exist though moderate between Body Mass Index and FVC, FEV1 and FEV1/FVC. The present analyses indicates that majority of the population are normal weight and least occurrence of obese among them. Though it is seen there is a slight emerging trend for overweight among the population.

Prevalence of sustained hypertension is on rise in urban area in adults as well as younger age group (Mohan et al, 2004). Very few systematic population based studies on blood pressure and BMI available among the tribes of Arunachal Pradesh. Hypertension and obesity is an increasing world health problem. Therefore the present study enables the understanding of the dynamics of blood pressure with respect to age, sex and BMI. Mean

systolic (126.57 mmHg) and diastolic (84.05 mmHg) blood pressure suggests that the population falls under the category of prehypertension. Highest numbers of both male (62.55%) and female (65.37%) participants are observed in the prehypertension category of blood pressure classification. High altitude environments might be expected to cause some physiologic distress of the inhabitants, particularly by exhibiting a moderate degree of pulmonary hypertension, but lesser levels of systemic pressure, than their lowland counterparts (Gupta et al., 1989).

The mean height and weight of the male participants were found to be higher than their female counterparts. On contrast the mean BMI of the female participants was found to be higher than the male participants. The mean systolic and diastolic BP was found to higher in the male participants than to that of female participants, this is consistent to the study by Mungreiphy et al. (2011). It is also similar to the study conducted by Zuhail (2008) on the relationship between body mass index and blood pressure among males and females. The difference in blood pressure among the male and female participants could be attributed to hormonal differences between the two sexes. While sorting out the relationship between BMI and SBP and DBP it is observed that there exist a positive relationship between BMI and SBP and DBP among the male as well as female participants though this is of very lower magnitude this is consistent to the study made by Aliyu et al., (2014).

The world is going through a nutritional transition phase. Variation in human body has always been a subject of interest to physical anthropologist. Body shape can also be influenced by environmental conditions, nutritional habitudes and socio-economic status as well (Bogin, 1999; Roche and Sun, 2003). In the study it is observed that there is a trend of increasing mean weight with the increase in age upto 50 years of while it gradually decrease after 50 among both the genders and in mean height fluctuation is observed. Majority of male are medium statured and females are lower medium (According to Martin Classification,

1928). Thus higher value of height vertex and body weight among the Tawang Monpas suggest that it is due to the results of localized morphological adaptation as well as genetic make-up. Regarding BMI it is seen that majority of the population suffers from obesity (49.62%) which is almost half of the total population. Females (52.14%) show a higher percent of BMI as compared to their male (47.19%) counterparts. There is a gradual increase of waist circumference with the increase of age among the participants. Regarding WHR highest number of males and females are found in the obese category. The ratio of WHR is being used more frequently to estimate possible relative increases in abdominal fat. The study reveals that there is high prevalence of central obesity in the population where waist circumference is highest in obese category (male-51.69% and female 82.10%), WHR also in obese category (male-87.27 and female 96.11%) and WHtR also in the obese category (male-86.14% and female 89.88%). The conicity index of the population also confirms the high prevalence of central obesity in both the population group. Blood pressure tends to rise with age. It is generally accepted that once you are hypertensive you are always hypertensive (Gupta, 2008). Successful control of hypertension requires the combined effort of both the doctor and the patient. The patient by changing his lifestyle such as losing weight, reducing stress, adopting healthy eating habits and practicing a couple of exercise can definitely lower the number of hypertension patient. If blood pressure is elevated to a very high level, there is likely to be a need for urgent treatment.

The study can be concluded that the relationship of nutritional status based on BMI with lung function test is negatively correlated. There is a negative association. Whereas the relationship between nutritional parameters and blood pressure (both S.B.P and D.B.P) is positive and significant. Aging has a deep impact on respiratory, blood pressure and nutritional parameters. The study reveals that the Tawang Monpa tribe has a normal range of respiratory parameters which may be due to their settlement in the high altitude. The

anthropometric parameters for height and weight are to the standards of Indian Council of Medical Research (ICMR) classification. Regarding blood pressure levels both systolic and diastolic falls under prehypertension level. Obesity is quite common among the population. This may due to their heavy nutritious diet. The Tawang Monpas are very much fond of fatty foods like milk, ghee and butter of yak which is much common in all the household of Tawang. The high landers of Tawang thus choose a unique adaptive strategy for their survival in the extreme harshness of weather. It can be concluded that despite the knowledge gained about various aspects of human biological adaptations at high altitude, new research areas have opened up indicating many problems and it evaluates the necessity of multidimensional research among the highlanders.