CONCLUSION AND RECOMMENDATIONS

Reasoning draws a conclusion, but does not make the conclusion certain,

Unless the mind discovers it by the path of experience!!!

Based on the results and observations and ensuing discussions presented in the previous sections the following conclusions have been drawn:

CONCLUSION:

6.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS AND PREVALENCE OF RISK FACTORS OF NCDs

6.1.1 Majority of the subjects belonged to the youngest cohort. The percentage of population has been decreasing continuously in the ascending order of age group; maximum subjects in the youngest age group and minimum in the eldest age group.

6.1.2 Females (53%) surpassed the males in total proportion.

6.1.3 Majority of the subjects were Hindus, with the majority belonging to general (unreserved) category.

6.1.4 More than eight out of ten subjects were married, followed by unmarried and widowed/divorced subjects.

6.1.5 Majority of the subjects belonged to joint family, which shows that joint families are still in vogue in the study area.
6.1.6 Around half of the subjects were graduate &/or above and one out of ten subjects were illiterate. Majority of the subjects were highly educated as the study was carried out in urban area and maximum subjects belonging to the youngest cohort.

6.1.7 Occupation wise majority of the subjects were skilled workers belonging to either government or private sector followed by home-makers.

6.1.8 On the basis of B. G. Prasad classification, majority of the subjects belonged to upper socio-economic class and least number of subjects was in lower socio-economic class.

6.1.9 Family history of chronic diseases was reported by 32% subjects. Majority of the subjects reported the family history of diabetes, followed by hypertension. History of chronic diseases was highest among first degree of relatives (mother and father).

6.1.10 With regard to behavioural risk factors of NCDs, tobacco consumption was found in approximately one third of the study subjects. Majority were smokeless tobacco users. The most used smokeless tobacco product was paan (betel quid), followed by gutkha (chewing tobacco), surti (khaini) and gul/sunghani. A positive trend was observed between age and tobacco consumption.

6.1.11 One out of ten subjects were consuming alcohol, maximum alcohol users were male subjects (22%) and only one woman reported to consume alcohol suggesting potentially beneficial influences of social mores. Age wise highest prevalence was observed in the eldest age group.

6.1.12 Considering physical activity, one out of ten subjects was physically inactive. Men were more insufficiently active than women. Majority of the subjects were moderately active and very few reported to be vigorously active. Out of three domains, maximum inactivity was recorded during leisure followed by during work and least during travel.
6.1.13 None of the subjects were consuming at least 5 servings of fruits and vegetables a day as recommended by WHO.

6.1.14 Regarding anthropometric risk factors, all the measurements except BMI namely height, weight, waist circumference and hip circumference were higher among male than female subjects. Only half of the study subjects were in the normal category, rest was either underweight or overweight. On the basis of WHO global classification of BMI, every four out of ten subjects were overweight or obese. On the basis of waist circumference and waist-hip-ratio four out of ten and seven out of ten subjects were abdominally obese respectively. The prevalence of overweight, obesity and abdominal obesity was higher among female than male subjects. Mean BMI and the prevalence of central obesity both were highest in the 45-54 years age group.

6.1.15 Overall one third study subjects were hypertensive and every fourth subject was in the pre hypertension category. The prevalence of hypertension and pre-hypertension was higher among male subjects. Mean systolic and diastolic blood pressure was 124.2 mmHg and 83.4 mmHg respectively. Overall the highest systolic BP and diastolic BP were maximum in the eldest age group and the preceding eldest age group respectively.

6.1.16 Biochemical parameters were done on sub sample (104) due to logistic constraints. Mean fasting blood glucose was 111.28 mg/dl. The prevalence of hyperglycemia was 17% and the prevalence of diabetes was more than two times higher among male than female counterparts. Age wise the majority of the diabetic subjects were from the 35-44 years age group among the male subjects and 45-54 years age group among females.

6.1.17 Mean fasting blood triglyceride level was 153.18 mg/dl. One out of ten subjects had raised blood triglyceride. The prevalence was higher among female than male subjects. Age wise among male 45-54 years age group and among females eldest age group had the highest prevalence of hypertriglyceridemia.
6.2 ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC, BEHAVIOURAL, ANTHROPOMETRIC AND BIOCHEMICAL RISK FACTORS OF NCDs

6.2.1 Gender, age, caste, marital status, education, occupation and socio-economic status were significantly associated to tobacco consumption.

6.2.2 Logistic analysis revealed that being male, advancing age and lack of education were major determinants of tobacco consumption.

6.2.3 Alcohol use was significantly higher among male subjects and unemployed and unskilled workers. As one’s occupation decides one’s economic conditions, peer groups or colleagues, level of stress related to profession; therefore occupation is an important deciding factor which consequently affects the use of alcohol.

6.2.4 Physical inactivity was significantly associated to education and socio-economic status of the study subjects. Good education imparts better socio-economic status. Better socio-economic status involves less physically demanding occupation, availability of mechanized transport, availability of mechanized household appliances and sedentary life-style; all these factors results in less physical activity.

6.2.5 Body mass index was significantly associated to age, caste, marital status, education, occupation, socio-economic status and dietary habits. Logistic analysis confirmed that female had the higher odds of being overweight and obese than males. 45-54 years age group and primary educated followed by highest educated subjects were more at risk of overweight and obesity. Though not significantly different but the prevalence of overweight and obesity was higher among tobacco and alcohol users than their non-users counterparts.

6.2.6 Abdominal obesity was also found to be significantly associated to gender, age, caste, occupation, socio-economic status, tobacco and alcohol consumption, dietary habits and physical activity. Out of all these variables,
being female, 45-54 years age group, higher socio-economic status and physical inactivity were significant predictors of abdominal obesity. Other than that tobacco and alcohol use was significantly proved to be protective factors against abdominal obesity. The reason behind this inverse association between alcohol use and abdominal obesity could be that majority of the subjects drink occasionally and that too low amount of alcohol.

6.2.7 Regarding hypertension; gender, age, marital status, occupation, education, socio-economic status, tobacco use, physical activity, overweight and obesity and abdominal obesity were significantly associated. Logistic analysis revealed that being male, advancing age, tobacco use and obesity were significant and independent determinants of hypertension. Out of the total subjects with hypertension, around one-third of the subjects were aware of their condition. Out of those who were aware, 70% were seeking treatment. Only a third of the treated subjects with hypertension had their blood pressure adequately controlled.

6.2.8 As observed, 45-54 years age group, retired & skilled workers, alcohol users and hypertensive subjects had significantly highest prevalence of raised blood glucose. With each increasing risk factor the prevalence of diabetes was significantly increasing, 3.8% among no risk factors to 50.0% among more than four risk factors.

6.2.9 BMI (body mass index) and diabetes were found significantly associated to the raised blood triglyceride. A significant association was found between number of risk factors and raised blood triglyceride.

6.2.10 Three out of ten study subjects reported to receive lifestyle advice by a doctor or any health care provider. Majority of the subjects advised to reduce salt, followed by start physical activity and eat at least five servings of fruits and vegetables a day.
6.3 DIETARY PATTERN OF THE STUDY SUBJECTS AND ITS ASSOCIATION WITH SOCIO-DEMOGRAPHIC, BEHAVIOURAL, ANTHROPOMETRIC AND BIOCHEMICAL RISK FACTORS

6.3.1 As per RDA by ICMR, insufficient dietary intake of calorie, sodium and potassium were observed in males & calorie, protein, carbohydrate, sodium, potassium & iron were observed in females. Total calories (kcal), carbohydrates (gm) and proteins (gm) were more or less within the RDA range or less than the RDA but fat (gm) consumption was almost two times higher than recommended among both the genders.

6.3.2 There was significant association observed in nutrients intake with respect to caste, education and socio-economic status.

6.3.3 Considering association between nutrients intake and behavioural risk factors, nutrient intake was higher among alcohol users, physically inactive subjects and among those who consumed unhealthy diet.

6.3.4 Overweight and obese subjects and pre hypertensive and hypertensive subjects had higher intake of major nutrients as compared to their normal counterparts.

6.3.5 Diabetic and subjects with raised blood triglyceride had higher intake of nutrients than their normal counterparts, but no significant difference was observed.

6.3.6 Four out of ten subjects were vegetarian. Only three out of twenty subjects had fixed timing of meals.

6.3.7 Majority of the study subjects were consuming three meals a day.

6.3.8 Majority of the subjects consumed mustard oil followed by refined oil.

6.3.9 Only 5 subjects reported the consumption of non-iodized salt.

6.3.10 Majority of the subjects reported to consume cow’s milk followed by buffalo’s milk.

6.3.11 Seven out of ten subjects preferred spicy and fried foods.
6.3.12 Around one third subjects reported to take extra salt and extra ghee during meals.

6.3.13 Only one out of ten subjects was consuming flour with choker.

6.3.14 Cereals especially wheat and rice formed the bulk of dietaries of the study subjects in the study area. Almost all the study subjects were consuming pulses daily. Red gram was the most commonly used legumes. Cereals and pulses were the main sources of energy and protein.

6.3.15 Milk and milk products consumption was far from being satisfactory especially among female subjects.

6.3.16 Consumption of meat, chicken, fish was once or twice in a month by majority of the subjects. Egg was consumed much frequently than other non-vegetarian items.

6.3.17 Roots and tubers and green vegetables were consumed almost daily by the study subjects, while consumption of fruits was less frequent. The higher consumption of roots and tubers and cereals were mainly due to predominant food crops grown in the study area. Locally grown food stuffs are cheaper and available in abundance.

6.3.18 It seems from the results that westernized dietary patterns has still not reached to the study area completely as the consumption of fast foods items (pizza, burger, french fries, noodles) was very infrequent and majority of the subjects never consumed such items except for noodles.

6.4 SELF-PERCEIVED HEALTH AND ITS ASSOCIATION TO THE PRESENCE OF RISK FACTORS

6.4.1 The prevalence of excellent, good, fair and poor health was 7.8%, 72.0%, 18.4% and 1.7% respectively. After merging excellent and good into good health and fair and poor into poor health, two out of ten subjects reported their health poor. Poor perception of health was two times higher among women than men.
6.4.2 Regarding general health issues, majority of the participants reported tiredness followed by pain, weakness, dizziness, digestive complaints and then breathlessness. All the health issues were significantly higher among women than their male counterparts.

6.4.3 Association between self-perceived health status and socio-demographic characteristics revealed that gender, caste, marital status, education, occupation and socio-economic status were significantly associated. Overall, being female, being married, lack of education, unemployment were the determinants of poor self perceived health.

6.4.4 None of the risk factors, except hypertension & waist-hip ratio were significantly associated to self-perceived health. Fortunately, a majority of the factors associated with self-perceived health examined in this study are modifiable (eg, hypertension, WHR) and can be prevented or reversed with changes in lifestyle.

6.4.5 Dietary intake of all the major nutrients & minerals were significantly higher in those who perceived their health good.

6.4.6 A positive and significant association was observed between self reported NCDs and number of risk factors among the study subjects. Prevalence of NCDs was reported by 4.7%, 11%, 28% and 30% study subjects among no risk, one or two risk factors, three or four risk factors and more than four risk factors respectively.

RECOMMENDATIONS:

Based on the conclusions drawn from the present study following recommendations were made. These recommendations were divided into two parts. The first section presents a set of recommendations to government and other authorities. The second section offers a set of recommendations providing suggestions for future researchers in exceeding the scope of this study.
Service Recommendations:

❑ As the results indicated, the prevalence of NCDs risk factors were gender related, gender sensitive preventive measures should be taken into consideration.

❑ A continuous national surveillance system on risk factors should be instituted by the Centre for Diseases Control and Prevention to offer up-to-date analysis of the national risk factor profile.

❑ Data on multiple risk factors should be used as the baseline foundation for legislation and intervention by the public health authorities and policy planners.

❑ Clinicians, including medical doctors, physiotherapists and nurses in both public and private health care sectors, should incorporate enquiries on modifiable health risk behaviours in order to ensure early detection at the primary health care level.

❑ Establishment of alternative, low cost and feasible strategies for screening and early diagnosis of NCDs for their optimal use in health system settings.

❑ Formulation and strengthening of policies to control the incidence of tobacco use in schools, workplaces and other public places to minimize the effects of smoking on smokers, passive smokers or the general public as a whole.

❑ Routine public education on awareness through educational campaigns for promoting healthy life styles.

❑ Establishment and strengthening of a stepwise surveillance system for NCDs to monitor the trend of the diseases over time.

❑ Build capacity and mechanisms for optimal utilization of collected data through timely dissemination of information, linking to policy, planning, and program implementation and providing research impetus.

Research Recommendations:

❑ In order to account for seasonal variation in physical activity and dietary pattern, a prospective study will be useful.
Conclusions & Recommendations

- Longitudinal assessments of social, cultural, and economic determinants of behavioral risk factors to characterize their relationship and impact to NCDs and to plan interventions accordingly.

- To study behavior management strategies for modifying risky behaviors at individual, family, and community level.

- Further research in this area with larger sample size is needed to create baseline data of risk factors of NCDs for policy makers, especially incorporating Step 3 of the WHO STEPwise protocol to give a more comprehensive profile.

- For wider applicability it is proposed to undertake multi-centric studies on risk factors of NCDs to assist in taking preventive steps in right direction.