SUMMARY
AND
CONCLUSION
SUMMARY

Food security is a state of existence in which people have physical, social and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life” (FAO). India is likely to be the most populous country on this planet with the population projection of 1.6 billion by 2030. Ensuring food and nutrition security is thus a challenge for India.

Household food security is the ability of the household to secure enough food to meet nutrient requirements of all family members. The ability of an individual to fully reach his/her personal and economical potential depends to a large degree on his/her level of nutrition security. Monitoring food security can help to identify and understand the basic aspect of well-being of the population and to identify population subgroups or regions with unusually severe conditions. The measurement of food security is crucial for projection of the need to introduce and monitor intervention programs by national and agencies.

In developing countries, rural women and men play different roles in guaranteeing food security for their households and communities. When women are empowered economically, income flow increases. Similarly, when men along with women engage in household planning for food and nutrition security, households become more food secured. The major factors that affect an individual’s food security are household food availability, household behaviours (including decisions and choices regarding food acquisition and intra household allocation), and the individual’s health and nutritional status. Comparing gender differences in the food habits within various cultural contexts may increase understanding of their role in public health. Gender differences in food habits and other dimensions of health behaviour are not specific characteristics of just country; they have also been reported in studies.

The present study focuses on assessing household food security in two taluks from South Canara district, and gender based differences food and nutrition security. Social studies of health and food security suggest a complex relationship between socio-economic status, nutrition and well being. This study bridges these fields of
research, focusing attention on the intersection of education, income, access to food, and perceptions of nutrition and health.

The objectives of the study are:

- To study the food and nutrition security at Household level in selected families in two taluks of South Canara.
- To study the factors influencing food procurement and food distribution in the selected families.
- To study the food behaviours among family members and factors influencing the Food Security.
- To study the gender differences in food and nutrition security of selected men and women (husband and wife couples).

METHODOLOGY

A prospective study was conducted in two stages - A cross sectional and in-depth studies.

1. Selection of study population: Cluster sampling was adopted for selecting study population, two major clusters for the study were Karkala and Moodbidri Taluks, 350 household from each cluster formed the study population. Each taluk was divided into five clusters, 70 houses were selected according purposive sampling. 700 families from the study area was the total population.

2. Methods for data collection: Data was obtained through house to house contact; the female head was the respondent. The data was obtained using standardized structured and unstructured questionnaires. The assessment included General information about the family and the subjects, Food related activities of the family, Eating behaviour, FFQ, Food security module- USDA, Quality of Life- CDC HR QOL-14 questionnaire and Assessment for general health condition.

Stage 2: In-depth study - Semi-longitudinal - 70 husband and wife couples aged 38-64 yrs formed the sub group for in-depth study. They were selected from cross
sectional population; purposive selection was adopted based on their willingness to participate in maintaining food diary for the family, participate in assessment of nutritional status, and Physical activity assessment.

**Compliance with Ethical issues**: The study was approved by the HEC, University of Mysore, Mysore, before its commencement. A written consent was obtained from participants.

**Details of the assessment protocols are given in the flow chart.**

**Limitation of the study: Major**

- Number of families included for in-depth study-semi longitudinal was small.
- Gender influence was compared for male and female couples (family head) only.

**RESULTS:**

The results are discussed under the following heads:

1. Demographic characteristics of study population
2. Family meal activities
3. Food behaviours
4. Nutrition and Health Security of adult male and females
5. In-depth study of adult male and female couples

❖ **Demographic characteristics of study population**

    Majority (90%) of the households in Karkala taluk were nuclear families, differences in family type in the two taluks were statistically extremely significant. 10 and 16% families from Karkala and Moodbidri were headed by females. 79 and 91% of the households had 1-2 children. Majority were literates (53-70%) and considerable percentages were graduates. The occupational feature indicated that women were predominantly home makers; men were involved in agriculture and agricultural labourers, business, professional, teachers and officials. Hinduism was major religion followed by Christianity and Jainism and least was Muslims. Majority belonged to middle and low SES.
Family Meal activities

Adult woman are the major decision makers for all meal related activities, like food purchase, meal planning, preparation and distribution. Family income bore a close association to pattern of purchase, 50% of the households in the two regions purchased cereal and legumes once a month. Vegetables, greens and fruits were purchased daily and once to thrice a week. 28 and 34% purchased meat once a month. Frequency of sea foods purchased varied. 50% purchased oil once a month and use of instant and bakery foods were more frequent in Karkala than in Moodbidri. Likes/dislikes of foods were the most leading factors for purchase, availability and cost occupied the 2nd and 3rd position in the order of importance. Custom was the least important factor. Nutrient requirements as a factor for food purchase varied with ranks given as 1-5. The most potent influencing factor for meal preparation and food allocation was likes/dislikes and were scored ‘1’ (49% and 52% in Karkala; 52 and 32% in Moodbidri respectively).

Food Behaviours

45-60% of the households from Karkala and Moodbidri observed fasts respectively. 87 -91% mentioned to have family meal, dinner was frequently a family meal. Skipping meals was common with adults and children more frequency was seen in Karkala Tq. Munching was also a common behaviour (73 and 61%) watching TV and chatting were the occasions for munching. Eating outside home was relatively high in Karkala (50%). Visiting friends/relatives were less common in Moodbidri (49%). Frequency of participating in weekend parties was less common in both regions.

Par boiled rice was the popular cereal, use dhal and whole legumes, roots and tubers were 2-3 times a week or fortnightly. Greens consumption was relatively high in Moodbidri, and fruit consumption appeared to be better. Coconut and coconut oil was most in use for daily cooking. Refined vegetable oils were used in relatively small proportion. Among the sweeteners, sugar and Jaggery was predominantly used on daily basis. Sweets from sweet marts were consumed in higher proportion. Tea and coffee were the popular beverages, however, ‘Kashaya’, (herbal drink) was most popular. 50% household consumed fried foods 2/3 times a week (less frequent). 34 - 45% households consumed bakery items daily. Milk and milk products were
consumed daily by all the participating households. Being a coastal region use of sea foods was most frequent. The popular item was Sardine followed by Mackerel, use of chicken was next to sea foods. An overall consumption can be considered an essentially similar in the two regions.

**Nutrition and Health Security of adult male and females**

In general the health status of the adult male and females was satisfactory, majority of the females and males in two regions had BMI within the normal range, except for males from Moodbidri, who were overweight. Men from Karkala had a mean MUAC of 29.9±4.828 cms and those from Moodbidri had 30.4±7.431cms. WHR exhibited a typical occurrence of central obesity. Degenerative diseases like DM and hypertension were prevalent in the population studied, 8-12% of males and females in the two regions were diabetics while 4-8% were hypertensive. A difference in their anthropometric profile was noted as compared to their normal counterpart (non diabetic non hypertensive). Diabetic and hypertensive males and females were shorter and heavier as compared to the normal subjects. Other parameters such as hip and waist circumferences were markedly lower in normal subjects than those with DM and HT.

The family food security was found to be 67% in the study population, those who were in secured, 73% had no hunger and 27% experienced hunger. A variety of factors was found to associate with family food security such as education status of the family head; education of both male and female had a marked effect. The phenomenal influence was seen when both man and woman were educated. Food security percentage decreased with one of the partners were uneducated, least security was noted in families where both were uneducated. A simultaneous increase in food insecurity with hunger was noted. Socio economic status is a corollary to education; hence a marked effect of SES was noted on family food security. Hence there was extremely significant association between income and food security. Family size was also found to influence family food security.

QOL was a measure of health of the family members, both males (49-63%) and females (51-66%) claimed to have ‘Good’ QOL. SES, diet type, family size and education status were found to affect the QOL, never the less, markedly higher percentage of males experienced sickness. Major form of sickness in men and women
from high SES experienced mental illness. Small family size, non vegetarianism had positive influence on QOL. Higher proportion of physical illness was noted among professionals. Males (50%) and females (55%) were found to be inflicted with sadness/depression followed by tension/worries (50%). 32% men and 44% women were found to have sleep disturbance. 81% men and 93% women mentioned they had low energies. Females have a relatively higher number of days of suffering from all the symptoms investigated.

**In Depth Study of Adult Couples-Male and Female**

Nutrient intake of the family was studied using 7 days diary technique, consumption units were used to derive the nutrient adequacy. Per caput energy intake by the family members was considerably less and met on an average 63% of their requirements. Certain nutrients such as protein, calcium and fat intakes were considerably higher than their respective requirements. Especially fat intake was 2 to 2½ times the requirements. Iron intakes were closer to the requirements while β carotene intake was 40% and retinol 30% lower than the requirements.

CV were calculated to indicate the vastness in the inter family intakes, it was found that energy, protein and fat had small CVs suggesting similarities in eating pattern and low inter family differences. Micronutrients on the other hand exhibited large CVs (59-79%). Differences due to diet type were very small and statistically not significant except for protein. Non vegetarian were found to consume higher quantities of protein which was statistically extremely significant.

Individual food intakes were also obtained from the adult males and female heads of the selected families. Mean intake of energy by males and females in the vegetarian groups were 2011±286 and 1530±407.68 Kcals/day respectively and was 64 and 70% of their RDA respectively. Similarly the differences in the calorie intake among the non vegetarians was 2048 ± 306.406 and 2118 ± 220.919 Kcals/day the percent adequacy was 65 and 95% for men and women respectively. Protein intake was found to be more among females in both vegetarians and non vegetarians as compared to the men counter parts. Men consumed protein just sufficient amounts to meet their requirements. Among the micronutrients, calcium intake was higher in males, females consumed higher iron. β carotene although is the limiting nutrient in
the diets, females consumed higher as compared to their male counterparts. Difference due to diet type was very small.

CV for macro nutrients among both males and females was essentially similar except for fat intake. CV for micro nutrient in males exhibited high variations (33-52%) wherein iron intake had a higher CV. While there were no differences in CV’s for males. This suggests that females from vegetarianism non vegetarianism consume more or less similarly quantity of nutrients.

Energy intakes were found to have a positive association to protein, calcium and iron intakes. Those diets where energy intakes met the requirements, protein, calcium and iron intakes met their respective requirements. Protein and calcium intakes had significant correlation with energy intake among both vegetarians and non-vegetarians; iron and β-carotene intake did not show such correlation consistently.

The energy balance studies suggested that male members had a fair energy balance. Their intakes matched with their expenditure while females exhibited a negative balance since their intakes were lower than their expenditure. Both men and women who participated in haemoglobin assessment were found to have normal Hb levels, none were found anaemic.

CONCLUSION:

My study has brought forth important and useful information regarding the household food security, characteristic of food insecurity and the influencing factors. I also exercised to present the gender differences in food and nutrition security and health profile, adult men and women who are head of the family and stakeholder were chosen for assessment. Among the two taluks studied, Karkala was more urbanised than Moodbidri with respect to family system and eating practices. Traditional system was practiced in Moodbiri, the elderly men still were the head of the family. Although certain traditionalistic systems were obvious, likes and dislikes of individual family members were respected and exercised at every stage of family meal activities, i.e., purchasing, planning, preparation and serving. Influence of custom on food distribution was given least importance. Adult woman and man own major responsibilities for feeding the family and take care of meal related activities.
Woman forms the leading member who exercises the discretion for planning, preparing and serving meals. Nutrient requirements were considered while serving food to family members especially the children but extent of application is small and much dispersed. In the region, food purchasing pattern differ to a very small extent across the economic group, this was very surprising, and however, such patterns are inevitable due to the weather conditions. The weather in the study area being damp most of the season, they encounter storage problem. Hence a uniform pattern is better sustainable.

The family food security in study population was found to be 67% across the region and the families with vegetarian and the non vegetarianism. Income, education and family size were most influencing factors for food security. Education of woman contributed extremely to the food security. Family nutrient intake indicated that protein, calcium, iron and fat were higher than requirements. The total food insecure families formed 33%, among these 73% were food insecure without hunger while the severe food insecurity which included the experience of hunger occurred in 8.7% only, wherein the laborer families were maximally affected. Education of both adult man and woman affected family food security.

Percaput intake of Energy of the family members was less than requirements by 37%, while vitamin A and its precursor were consumed less compared to RDA. The gender effect studied indicated less difference in all the assessed parameter. Nutrient intake between male and females were negligible. Health profile was essentially similar among men and women.

Nutrient intakes of men and women were essentially similar; both the genders consumed less energy while other nutrients such as protein, calcium, fat and iron intakes were higher than their respective requirements. A critical view of the intakes suggests that women consumed all nutrients in little higher quantities than those of their male counterparts. Among the micronutrients, β carotene and retinol intakes were very low among both men and women. With respect to health conditions, the most prevalent were diabetes (male-9; females 10 %) and hypertension (males-6; females-4%) and essentially equal percentage of men and women were inflicted. QOL was a good addition to explain the coping ability, the major problem was found to be the mental sickness than the physical sickness, and both men and women experienced
these in an essentially similar manner. My study has tried to provide evidence that in the contemporary society gender differences have minimized to great extent. Women take the leading role in family food security while men contribute to the cause equally in a different perspective. 8.7% of the study population had severe food insecurity. This figure appears to be glaringly high. The local authorities need to be sensitized about the high prevalence of risk for nutritional diseases so that resources can be mobilized in a better way to reduce hunger.