Chapter V

SUMMARY AND CONCLUSION
Summary
The present study is a cross sectional study which has been carried over a period of two and a half years covering urban as well rural women with the aim to obtain empirical information about "Nutritional Status and Dietary Habits of Kashmiri Women". A sample of 1600 women (800 Rural and 800 Urban women) was selected. Data on nutritional status was collected through clinical assessment schedule and nutritional anthropometry (height, weight, body-mass index). It was further supplemented by assessing dietary intake using 24 hour recall method. For assessing dietary habits and nutritional knowledge, information was gathered through a pre-formed questionnaire. The nutritional knowledge has been quantified using scoring method. The main findings of the study have been summarized under four main headings.

A. General Characteristics.
B. Nutritional Assessment.
C. Dietary Habits.
D. Nutritional Knowledge.

A. GENERAL CHARACTERISTICS

Overall mean age among studied women was 27.89 ± 6.33 years. Mean age of pre-pregnant women was 23.6 ± 4.49 years, for pregnant women it was 25.09 ± 4.55 years, that of lactating women was 28.31 ± 4.97 years, whereas for non-pregnant non-lactating it was 34.50 ± 5.01 years. Studied women were mostly (99.0%) Muslims with 44.1% women being illiterate and 55.9% literate of which 11.5% were primary, 10.8% matriculate, 20.0% graduates and 11.6% had technical education (professionals and post-graduates). Majority of women (52.9%) were either semi-skilled or skilled and about 43.5% were housewives. 13.7% women belonged to low socio-economic status, 36.6% were in lower-middle or
upper-middle socio-economic class and 49.7% belonged to high socio-economic class. Mean per-capita income per month of women was Rs. 2,210 ± 1579. Three-fourth women were living in joint families and 26.2% lived in nuclear families. Average median number of family members per family was seven and median number of children per woman was two. 58.5% women had 1-2 children, 31.8% had 3-4 children and 9.7% had more than four children.

B. NUTRITIONAL ASSESSMENT

i) Clinical Examination:

Clinical examination of women showed that about 15% women had thin built, 12.6% women had hair abnormalities manifested either as lack of lustre or easy-pluckability. Hair abnormalities were highest in lactating women (16.0%), followed by pregnant (13.2%), non-pregnant non-lactating (12.5%) and pre-pregnant women (8.5%) respectively. 8.3% women had skin abnormalities which were seen as diffused-depigmentation of skin or presence of dry and scaly skin. Percentage of women with skin abnormalities were highest among pregnant group (11.0%). However this percentage was almost same (8.7%, 8.0%) for lactating and non-pregnant non-lactating women and least among pregnant women (5.5%). Overall 52.0% ladies had pale conjunctiva. The percentage of women with pale conjunctiva was highest among pregnant group (66.2%) followed by lactating women (54.2%). 49.0% non-pregnant non-lactating women and 38.5% pre-pregnant women also had pale conjunctiva, the signs indicative of anaemia. 94.9% women had normal lips whereas 4.3% women had angular-stomatitis and 0.8% cheilosis. Clinical examination of tongue showed 88.1% women (overall) had normal tongue with 11.9% women having abnormalities like red and raw tongue signs or pale and flabby tongue signs indicative of B-complex deficiency. Percentage of women
having B-complex deficiency were comparatively higher among lactating and pregnant women. 9.1% women presented deficiency symptoms of Vitamin C (Bleeding Gums). 22.8% women had either spoon shaped nails or had white spots on nails, a common sign suggestive of anaemia among women.

Clinical assessment of women at large revealed symptoms and signs suggestive of anaemia as a common finding with occasional B-Complex deficiency symptoms which gets more prominent during pregnancy and lactation and continues during non-pregnant non-lactating status.

ii) Anthropometry:

Present study revealed that there was significant variation in the mean body weight of women in different physiological status. Overall mean body weight of women was 53.89 ± 8.53 Kgs which corresponds well with an average reference women. It was lowest in pre-pregnant state (51.10 ± 6.42 Kgs). There was not much difference in the mean body weight of lactating (52.88 ± 9.16 Kg) and non-pregnant non-lactating women (53.89 ± 8.53 Kgs). The mean body weight of pregnant women was expectedly higher. The mean height of women in the present study was 155.70 ± 7.34 cms and an insignificant difference (p = .331) in heights of women belonging to different physiological status was observed. Thus pointing towards the fact that height is independent of physiological status after it has attained particular potential. Mean BMI of women as per present study was 22.534 ± 3.4219 Kg/m^2. 69.3% women were normal as per BMI classification and 30.7% women had either under or over-nutrition. Mean BMI of pregnant and non-pregnant non-lactating women was towards higher side in comparison to pre-pregnant and lactating women. The overall percentage of women with BMI below 18.5 Kg/m^2 was very low, viz., 10.9% and it
ranged between 11.5% in non-pregnant non-lactating women to 13.5% in lactating women. Thus minor percent of our mothers begin their reproductive life with chronic energy deficiency.

iii) Nutrient Intake:

Overall mean calorie intake of women was 1967.07 ± 366.85 Kcal with about two-third (77.5%) of women having varying percentages of calorie deficit in comparison to RDA. 45.9% were having upto 20% deficit. The mean calorie intake (1801.24 ± 279.75 Kcal) was lowest among pregnant ladies and the percentage of women with calorie deficit was also highest (94.0%) among them; moreover about one-third (30%) pregnant women had calorie deficit between 20% - 40% in comparison to RDA. This was because there was lower intake of bulk foods by pregnant women due to nausea vomiting etc. which are common features in pregnancy and also a specific dislike towards rice (a major source of calories in Kashmiri diet). Mean calorie intake was better in lactating women (2366.99 ± 401.99 Kcal) and percentage of women showing calorie deficit between 20% - 40% was almost half the percentage than in pregnancy (30.0%) and this improved calorie intake was because good percentage of women were consuming special foods during lactation. Mean calorie intake of pre-pregnant and non-pregnant non-lactating women was almost same i.e. 1856.38 ± 185.36 Kcal and 1843.68 ± 22.64 Kcal respectively. However, the percentage of women in pre-pregnant status with 20% - 40% calorie deficit was 17.5% as compared to 10.5% in non-pregnant non-lactating status. This was attributed to restricting of calories or foods in general during pre-pregnancy stage to maintain body shapes and avoid overweight. Mean calorie intake in relation to age revealed that with advancing age there was increased mean intake of calories among pregnant, pre-pregnant and non-pregnant non-lactating women. However inter-group variations were insignificant. It was further
observed that with advancing age there was a decrease in percentage of women with below normal calorie intake per day in general as well as in different physiological groups. Similarly, almost no difference was observed in mean calorie intake among women in different physiological groups and also the percentage of women with normal or below normal calorie intake belonging to joint / nuclear families. Type of family showed some effect during lactation and pregnancy. Mean calorie intake of women belonging to different socio-economic classes showed lot of variations and inconsistency. Yet mean-calorie intake of pregnant women did increase as the socio-economic status improved whereas reverse was true for non-pregnant non-lactating women. There was no definite relationship between occupation and calorie intake.

Literacy status had an positive impact on calorie intake of mothers i.e. mean calorie intake and percentage of women with normal calorie intake was higher among literate group as compared to illiterate. This was related to overall knowledge and understanding of nutritional requirements and intakes.

Overall mean protein intake of women was 51.07 ± 12.79 gms: with 76.3% having varying degrees of protein deficit, of which 41.7% were having only upto 20% protein deficit compared to RDA. Mean protein intake of lactating women was higher (63.91 ± 11.40 gms) than mean protein intake of pregnant and non-pregnant non-lactating women (45.72 ± 11.78 gms and 45.15 ± 8.62 gms respectively). The percentage of women with protein deficit was highest amongst pregnant group with 34.5% having more than 40% deficit and 32.0% having between 20% - 40% deficit. This was related to multiple factors such as dislike towards meat, food taboos like non-consumption of fish and curds, milk and fish together or egg and
milk together. Mean protein intake among pre-pregnant women (49.49 ± 8.98 gms) was better than non-pregnant non-lactating women and the percentage of pre-pregnant women with protein deficit ranging between 20% - 40% was also better (13.5%) in comparison to non-pregnant non-lactating group (25.5%). The percentage of women with protein deficit (around 20% - 40%) being lesser in lactation than in pregnant women (32.0%) was because of consumption of protein rich foods used as special foods by women during lactation. It was also seen that with increase in age there was increase in mean protein intake in all physiological status. Percentage of women with below normal protein intake dropped down significantly with increase in age during pregnancy and lactation. Type of family as such had no definite impact on protein intake. Except non-pregnant non-lactating group, the mean protein intake and percent of women with normal protein intake was highest among professional women followed by skilled group and housewives. Similarly mean protein intake and percentage of women with normal protein intake in relation to socio-economic status depicted that women from high socio-economic class had highest mean protein intake in all categories and those belonging to low socio-economic class had lowest mean protein intake. Mean protein intake and percent women with normal protein intake was higher among literate ladies as compared to illiterate women in general and also in different physiological status. The difference being statistically significant (p = .000). This was related to better knowledge and positive attitudes towards various protein rich foods.

Mean dietary Iron intake of women in general (11.0845 ± 5.8626 mgs) and in different physiological conditions was lower than RDA. Mean dietary iron intake was lowest in pregnant women (8.5124 ± 2.2517 mgs) and in pre-pregnant state it was 10.625 ± 2.1562 mgs (which was
comparatively better than in pregnant and non-pregnant non-lactating status). During pregnancy percent women with 40% or more dietary Iron intake deficit was more as compared to lactating group. This was not only related to poor intake of Iron rich foods (like green-leafy vegetables) throughout the year due to non-availability and variations in dietary consumption resultant of pregnancy induced nausea and vomiting but also to poor nutritional knowledge regarding sources and functions of nutrients in these groups. Age did not influence men dietary Iron intake of women in general and in different physiological status. Type of family and occupation as such had no definite effect on dietary Iron intake. However, mean dietary intake of literate women was better than illiterate women and professional women had higher mean dietary Iron intake per day (but lower to RDA), yet this trend was not seen in all physiological status which indicated that occupation did not as such influence dietary Iron intake.

Overall mean dietary Calcium intake of women was 434.72 ± 265.56 mgs (ranging between 75 mgs – 1684 mgs). The mean calcium intake was lowest among non-pregnant non-lactating women (371.38 ± 180.95 mgs) and highest amongst women of lactating status (543.60 ± 337.91 mgs). There was not much difference in mean calcium intake of women belonging to pre-pregnant (421.18 ± 269.53 mgs) and pregnant (402.71 ± 214.33 mgs) status. Overall 78.2% women had dietary calcium deficit of varying degrees. 47.6% of the total studied women had > 40% calcium deficit, however the percentages were higher among women belonging to pregnant group (72.7%), followed by lactating women (67.0%). The lower calcium intake of women was related to exclusion of milk and milk products (71.3%), a major source of calcium in their diet and poor nutritional knowledge of women regarding sources of nutrients. While comparing the nutrient intake of studied group of women with RDA for different physiological status it
was found that women consumed all nutrients in lesser quantities in general especially Iron was worst hit nutrient followed by calcium, calories and proteins respectively.

C. DIETARY HABITS

98.4% women were non-vegetarian and just 1.6% were vegetarian. Rice was universally consumed by all women irrespective of their physiological status. Food frequency showed 98.3% women consumed green-leafy vegetables on daily basis whereas 1.7% included it 4 – 5 times per week in their diet. 81.3% women consumed pulses on weekly basis and percentage consumption was comparatively better during pregnancy and non-pregnant non-lactating state. 92.5% of women consumed pulses occasionally and percentage consumption of pulses once or twice was almost negligible, however, it was better during pregnancy (11.7%) and lactation (7.5%). 46.2% of studied women included meat / poultry occasionally in their diet. Frequency of meat / poultry was better among pregnant (28.5%) women followed by pre-pregnant group (23.1%). This frequency was almost same among lactating and non-pregnant non-lactating women. More than half (56.4%) women in general consumed milk / curd occasionally, however it was mostly consumed by lactating (37.4%) and pregnant women (31.0%) on daily basis. Again there was not much difference in the percentage of women belonging to pre-pregnant and non-pregnant non-lactating status as far as milk / curd consumption on daily basis was concerned. 62.4% women followed four-meal pattern, 33.6% ate five times a day and 4% followed three-meal pattern. Percentage of women following four-meal pattern was highest among pregnant group (80.3%) and five-meal pattern was mostly followed by lactating women (40%) and those belonging to non-pregnant non-lactating state (44.8%). Salt tea and (Tandoori roti) bread was common breakfast item and only one fifth
mothers add milk during pregnancy and about 20% add egg in pregnancy and lactation.

There was vast variation in likes and dislikes of women in different physiological groups. Amongst cereals, wheat was liked by negligible percentage (0.9%) and rice was more liked during lactation and pre-pregnancy compared to pregnant and non-pregnant non-lactating status. 26.7% women liked pulses, however pulses were mostly liked by pre-pregnant and pregnant ladies. Similarly among milk and milk products curds was liked by half of the women (50%) that too during pregnant and lactating status. Amongst foods of animal origin poultry was most liked, followed by meat and liking for both these foods was low during pregnancy. Liking for same was better during non-pregnant non-lactating and pre-pregnant status. One-third of women liked green-leafy vegetables, however during pregnancy spinach and sag was more liked. Variation in liking for green-leafy vegetables was not much between women in different physiological status. One-fourth of women liked fruits especially apples and citrus fruits than dry fruits and liking for fruits was much better during pregnancy and lactation than pre-pregnant and non-pregnant non-lactating status.

Commonly disliked foods were some of cereals, green-leafy vegetables, animal foods, sweets and miscellaneous foods. 11.3% women belonging to pregnant group disliked rice, 12% meat whereas 48.0% didn’t like knol khol and 57.2% didn’t liked sweets during pregnancy. Low frequency of food intake for certain food items coupled with likes and dislikes especially for rice and animal foods was probably one of the major reasons for caloric as well as protein deficit during pregnancy and increased frequency / liking of these items during lactational status had contributed to lowering of percentage deficit for mean calorie and protein intake. Even this
was also responsible for specific nutrient insufficiency in these physiological states. The enormous variation in food likes and dislikes among women in general especially during various physiological status were attributed to cultural factors, social influences or relative availability of food items that has determined the overall consumption pattern.

Consumption pattern of vegetables varied with seasons. During summers women consumed seasonal and all seasonal vegetables mainly. Whereas during winters legumes and pulses, dried vegetables, roots and tubers and quince apples were consumed. This difference in the consumption pattern of vegetables is attributed to seasonal availability, and Kashmir Valley being a hilly area mostly remains covered by snow during winters and most often remains cut-off from its winter capital Jammu, so people have to depend on semi-perishable, perishable and preserved foods e.g. legumes and pulses, roots and tubers and dried vegetables.

Special foods were consumed overall by 69.3% women (pregnant / lactating), however they were preferably consumed during lactation as compared to pregnancy. Garden cress (30.4%), organ meat (18.2%), milk and milk products (15.1%) fish (10.1%), fruits juices (5.9) included the list of special foods consumed by lactating group. The beliefs for such consumption were increase in haemoglobin content by use of organ meat / garden cress, increase in milk production with satiety to the child through mothers milk by consuming fish; also adds calories and small fraction of proteins. The list of special foods consumed by pregnant women included fruit juices (29.1%), milk and milk products (17.3) and dry fruits (13.8). Pregnant women even consumed gum Arabica soaked in water or milk (12.8%) and sharbats (9.2%). Thus adding foods of no calorie value but minor protein and vitamin benefits. Percentage of women consuming
special foods was highest among the age group 21-30 years. Type of family, socio-economic status showed better intake of special foods among women in joint family and high socio-economic class, occupation had no impact on same. During pregnancy literacy had an impact on special food consumption however during lactation it did not show any impact.

The most common food taboos generally followed by women were avoiding combination of fish and curds (67.9%), fish and milk (64.4%), dal and curds (27.4%) or discarding cooking water of spinach (22.0%). Likely nutritional impact of such restrictions or avoidance can lead to low calcium, vitamin and to some extent protein intake which other-wise is required in higher quantity during these physiological conditions and thus further adding to overall percentage deficit of these nutrients.

The dietary pattern of the women covered by the present study revealed that it was largely dependent on their habitual types and food items locally available. The food habits of Kashmiri women were also found to be related to seasonal variations that control the availability of food materials. Culture and taboos also had its impact on food habits of women.

D. NUTRITIONAL KNOWLEDGE

45.9% studied women in general had poor overall nutritional knowledge. Percentage of women with poor nutritional knowledge was more during pregnancy (21.5%) and lactation (17.0%).

53.8% women had poor knowledge regarding sources and functions of nutrients and nutrient losses during cooking and this percentage was much higher during pregnancy and lactation. However nutritional knowledge with regard to nutritional requirements was comparatively better
among women in general (32.7%) with 29.1% having poor knowledge. The percentage of pregnant and lactating women with poor knowledge regarding nutritional requirements remained lowest – which lead us to believe that mothers do possess better idea about nutritional requirements, however they were ignorant as to how or where from these nutrients can be provided (sources) and what is their role (functions).
Conclusion and Recommendations
CONCLUSION

The present study conducted among women around their reproductive period on nutritional status, dietary intake, food habits and nutritional knowledge revealed that majority of Kashmiri Women marry at proper age (21+ years) and observe family planning norms (2 or 3 children). They continue to live in joint families. Both literacy status and working status is on the rise.

The overall pre-pregnant nutritional status is better and is comparable to most of North Indian women however, anaemia constitutes a major (specific) nutritional problem throughout reproductive period with occasional B-complex deficiency being observed in small percentage of women. The main reason being low dietary Iron intake. The women in pre-pregnant stage have also predilection for restriction of diet (primarily calorie rich foods than protein rich) to maintain weight and body shape. During and after reproductive period although nutritional status remains more or less stable, yet calorie deficit can be observed in different physiological status. There is definite increase in percentage deficit of both calories and proteins especially in pregnancy than during lactation. The problem of anaemia is not only carried over to pregnancy as well as to lactational period but becomes more pronounced during pregnancy. This is mainly due to low intake of dietary iron because of poor knowledge about food sources, that is compounded by cultural beliefs, cooking practices, vague food habits, likes and dislikes. B-complex deficiency signs are also seen during these states. This is due to reduced intake of cereals, seasonal variation in intake of green-leafy vegetables and other foods rich in B-complex. The continuation of calorie insufficiency (deficit) to non-pregnant non-lactating state confirms influence of these factors having deep seated cultural roots. A
significant influence of socio-cultural / socio-medical factors on food intake during pre-pregnancy, pregnancy and lactation showed both quantitative and qualitative improvement with better educational status, improved economic status and good occupational status (working status). It is interesting to observe that these factors also affect the nutritional knowledge (with regard to source, requirement) and thus the intake.

RECOMMENDATIONS

In order to improve the knowledge and thereby have a favourable attitude and practices for better food intake by women of reproductive age, both long term and short term measures are recommended.

Amongst long-term measures various programs of general and specific nature are already in vogue. General (welfare) programs such as Total literacy campaign ‘TLC’, income generating and poverty alleviation programs, improvement of women status programs, improvement of nutrition education by inducting nutrition syllabus in primary classes and adult literacy programs in their long run will have a definite impact on overall nutritional status. Similarly specific programs like ICDS and specific nutrition programs [National Nutrition Anaemia Prophylaxis Program for prevention of nutrition anaemia] with direct nutritional components, have not only helped in enhancing nutritional status but also in improving nutritional knowledge amongst masses and thereby creating a favorable attitude towards better nutrition. What is required is to strengthen and support these activities and it is here that the department of Home Science can play a vital role by sensitizing implementing agencies. The department can hold seminars and symposia at regular intervals to stress importance and contribution of such programs in improving nutritional
knowledge in communities. Also department could directly provide material support like providing nutrition education material or even conduct nutrition demonstration classes for the implementing agencies or for the communities. A highly co-ordinated effort can make it quite effective.

**Short term measure** proposed could be a unique co-ordinated effort of ‘linking’ ‘nutrition extension services’ from the department of Home Science through a specially identified cadre of ‘Link workers’. These link workers (nutrition workers) would be identified from a large fleet of existing workers belonging to Health Department (Health workers – female or TBAS), Social Welfare Department (ICDS – AWW’S), Education Department (primary school teachers) who are local and are directly or indirectly involved in nutrition activities. The selected workers will be further motivated, reinforced and updated on nutritional knowledge (especially sources, requirements, cooking practices, socio-cultural factors etc.) on regular basis to enable them to interact and create awareness on various issues of food and nutrition. The entire activity can be co-ordinated and monitored by the department in collaboration with other departments and periodic evaluation can help in making desired changes where-ever required. Such type of a program activity has a tremendous potential if planned and co-ordinated properly.