CHAPTER - I
INTRODUCTION

1.1. Statement of the Problem

The human development of any society is judged by the health status of its population and more specifically by the health status of its women and children. Women’s health is a matter of concern, as they are the bearer of the next generation. The chances of survival of her newborn are dependent on her nutrition and health in terms of her capacity to nurse and nurture the child. It goes without saying that women is the axis of household who take care of sick and ailing persons, nurse the children and work towards betterment of the family. Hence, investment in women’s health and nutrition promotes equity, widespread benefits for the society and economic efficiency.

Women’s health and nutritional status is intricately linked with social, cultural and economic factors that influence all aspects of their lives. There are commonalities in health challenges faced by women around the world but inequality in access to resources and gender discrimination put women in further marginalized and disadvantageous position. India is one of the few countries where not only male significantly outnumber females but there is high maternal mortality, higher proportion of malnourished and anemic women facing more burden of ill health. Further in patriarchal set up, the low social status, early marriages, son preference, heavy work demand, social restrictions, inequality in allocation of food and other resources, low education levels, mistreatment, violence and crime against women add to her miseries and push her to further disadvantageous position.

It may be noted that at all ages women in high income countries live longer. They are less likely to suffer from ill health and premature deaths as compared to those living in poorer countries but it has been revealed through
National Family Health Surveys (NFHS) that in India, women’s malnourishment and health status is not in conformity with its economic status. It is interesting to study that why with much technical progress and with rising per capita income, it does not get reflected into the women’s health.

Haryana has made substantial gains in improving the overall life expectancy of men and women. Despite these gains, it may be noted that Haryana is one such state, where maternal mortality has increased (NFHS II and III). This raises questions whether the health systems are unresponsive to cater the needs of women or is it the societal failings in terms of how they are being treated which has led to their detoriating health and nutritional status. It is necessary to highlight that in a patriarchal set up like Haryana, women are indispensable in terms of amount of agriculture work they do yet they are subject to unequal access to food at home. In this context, present study attempts to study the issues of women’s health and nutrition at various stages of her life.

The health and nutritional status of women has received adequate scholarly attention in recent years. An overview of literature on various issues of women’s health that relate to her well being, gender discrimination in various aspects, her nutritional levels, reproductive health, factors affecting women’s health and nutrition in various socio-economic settings has been presented in following section.

1.2 An Overview of Literature

1.2.1 Women Nutrition

Malnutrition refers to imbalance between body needs for certain nutrients and their intake. Malnutrition has two major consequences: (i) women never reach their full growth potential and (ii) anemia. Both are risk
factors in pregnancy as this condition complicates childbearing and result in maternal and infant death and anemia increases her susceptibility to various diseases and reduces the energy. Under nutrition continues to be a widespread problem in India and as was revealed by National Nutrition Monitoring Bureau (NNMB) in late 70’s when it collected data on household and individual food consumption and individual nutritional status. It conducted survey in ten major states of the country on a sample basis and revealed that children below 13 years, at least 80 percent have lesser intakes than recommended for their respective ages (gender-specific data are not available under 13). Among 13 to 18 year old girls, over 80 percent consumed less than the recommended calories. Similarly, among women of over 18 years, 60 percent of those engaged in "sedentary" activity and almost 70 percent of those engaged in "moderate" activity had lower dietary intake than recommended. (Over 75 percent of pregnant and 80 percent of lactating women engaged in "sedentary" activity had less than recommended calories (NNMB, 1980).

National Sample Survey Organization (NSSO) also collects data on consumption on calories, proteins, fats and other food items. A comparison of various rounds on nutritional survey indicated that the per capita consumption of calories and of protein is falling in rural India, which is occurring against the increase in real household per capita expenditures. In rural India, household per capita calorie consumption was 2,240 calories in 1983, 2,233 in 1987–88 and had fallen to 2,047 calories per head in 2004–05, a decline of 8.6 percent from 1983. Over the same period, rural per capita protein consumption fell by 12.1 percent. Only per capita fat consumption has increased over a period of time. Similarly, in rural Haryana also there is a continuous decline in intake of calories from 3215 calories (27th round) to 2226 calories (61st round). In the same way intake of proteins also dipped from 90.0 per capita
(27th round) to 69.6 per capita (61st round). National Family Health Surveys (NFHS I, II and III) are another national surveys which presents the patterns of women health and nutritional status. This survey was first of all conducted in 1992-93 and later in 1998-99 and 2005-06. According to the recent survey of NFHS III (2005-06), a total of 31.6 percent females in rural Haryana reported to be thin (BMI less than 18.5). United Nation’s 5th report (2004) on world nutrition situation clears that the role of nutrition in development goes beyond providing an indicator of progress towards Millennium development goals (MDGs). This report outlines that nutrition is central to achievement of MDGs citing evidences that links nutrition to a range of other development outcomes.

Other than national surveys and reports on nutrition, various individual level studies have also been conducted to see the patterns and factors affecting women nutrition. In a sociological study based on a village in rural north India, eight non-pregnant and non-lactating women of 25-40 age groups were compared to male of similar age group and were observed for 32 days. It was found that men’s energy intake exceeded their energy expenditure by about 382 calories per day on average while for women there was a deficit of 433 calories per day on average. Women have to bear biological burden of menstruation, child bearing and lactation, which increases the problem of nutritional disorders among females (Edmondson and Edmondson, 1988). Later, in nineties, researchers studied nutritional status by generating data on anthropometric measure i.e. Body mass Index (BMI). BMI was considered as the most useful tool of nutritional assessment because of its simplicity, comparability from population to population and correlation with body fat. It was recommended as the basis of anthropometric measures of thinness and overweight (Qamara et al., 1990, Cole, 1991; Dwyer, 1991; Rolland-Cachera, 1993, Rao, 1996; Reddy and Rao, 2000). Malnutrition worldwide includes a
spectrum of nutrient-related disorders, deficiencies and conditions such as intra-uterine growth retardation, protein-energy malnutrition, iodine deficiency disorders, vitamin A deficiency, iron-deficiency anemia, overweight/obesity and other diet-related non communicable diseases (Ratzan et al., 2000). In a NFHS II data based study on Andhra Pardesh, researchers examined differences in anemia related to nutritional status in terms of body mass index. They used cross sectional data on women’s hemoglobin status, body weight at household and individual level. A total of 4032 ever married women aged 15-49 from 3782 households were taken into account. Prevalence of anemia was high among all women. Overall 32.4 percent women had mild, 15 percent of women had moderate and 3 percent women were suffering from severe anemia. Study revealed that 52 percent thin women (BMI less than 18.5) were found to be anemic while 50 percent women with normal BMI were found anemic. About 41 percent obese women were also found anemic (Bentely and Griffths, 2003). In another study on Haryana, prevalence of anemia in adult rural population was determined. The study was conducted in a door-to-door survey in seven villages of Raipur–Rani Block in district Panchkula, Haryana. Overall 2559 individuals of 16-70 age groups were interviewed. It was found that overall 47.9 percent population in 16-70 age groups was anemic while 50 percent females were found anemic. It was concluded that low socio-economic status, illiteracy and lower body mass index were found significantly associated with higher prevalence of anemia (Malohtra et al., 2004).

NFHS III (2005-06) revealed that women’s nutritional status in Haryana to be in poor state. About 31 percent females in Haryana have BMI less than 18.5 (which indicated chronic energy deficiency) and this was highly prevalent among the females of 15-19 age- groups (46 percent) as well as females of Muslim origin (49 percent). Barker et al., (2006) conductd a survey
on the nutritional status of women of ninety families in rural Maharashtra. They found that young women of reproductive age group had significantly lower BMI than their male peers. It investigated social and economic factors associated with this difference in thinness and explored the behavior in men and women that underlie these associations. Women were more likely to work in fields than men, to carry the complete burden of household chores, to have less sleep and to eat less away from home than men, moreover women did more fasting than men. Though these are the significant differences between behavior of men and women in the same household but no direct link between behavior and BMI was found. Bhasin and Jain (2007) attempted to study the nutritional status of scheduled tribes (Mina, Bhil, Sahariya, Garasia, Damor, Kathodi) of Rajasthan on the basis of their BMI. A sample of 2,928 persons belonging to both adolescent (8+ to 18+) and adult age groups (19+) were collected. All population showed an increase in the mean value of BMI in both males and females with advancing age and high prevalence of under nutrition was observed in both adolescent boys and girls on the basis of BMI. Among the tribes, Bhils had the lowest BMI than their counterparts in other tribes. Mina males and females exhibited highest mean values of BMI at higher age groups. Jose and Navaneetham (2008) analyzed the level of women malnutrition using data from NFHS III (2005-06). This data when compared to NFHS II revealed that over a period of seven years malnutrition especially iron-deficiency anemia has increased among women from disadvantaged social and economic groups. They also stressed on maternal malnutrition, which further extends beyond maternal mortality rate to Intra-uterine growth retardation, child malnutrition and prevalence of chronic diseases. In another study on Sangraur district, Punjab almost one-fourth of the total 445 women surveyed were reported thin (BMI less than 18.5). Most of the women who were found thin were illiterate and housewives (Dewan, 2008). Another study
tried to analyze the variations in food consumption and nutritional status of women in Orissa in both rural and urban areas against different background variables. The study also attempted to capture the differences between standard and actual level of food intake among different groups of women. The sample comprised of 4425 ever-married women in the age group 15 – 49 a profound variation in nutritional status was observed between the rural and urban women in Orissa. About 33 percent of urban women and 48.6 percent of rural women were found to be in the low BMI group. As far as food consumption was concerned, urban women enjoyed a better position in all the food items. Nutritional status was found to be positively related with education of respondent, education of husband, household standard of living and occupation of husband (Rout, 2009). However, the variation in nutritional status was not found to be very high between different categories of any explanatory or background variable in rural areas. Most of the rural women when categorized were found to be taking less food than their requirement.

Vashist *et al.*, (2009) studied the nutritional status of adolescents (boys and girls both) in rural and urban Rohtak, Haryana. A sample of 2000 adolescents which included 1000 boys and girls both from rural and urban areas were surveyed. Nutritional status in terms of stunting (height for age) and thinness (BMI for age) were calculated as per the National Centre for Health and Statistics (NCHS) standards. They found that the mean weight and mean BMI of adolescents in the 13–14 years age group was more in rural areas (38.83 kg and 16.97) than in urban areas (38.59 kg and 16.95). However, mean height was similar for this age group in both urban as well as rural areas. In successive age groups, all three parameters were more in urban adolescents than in their rural counterparts. Mean weight and mean BMI among female subjects in urban areas was more than those from rural areas in all age groups. However, mean height was similar in both the areas except
among adolescents of 15–16 years age group, where urban females were taller than rural females approximately by 1 cm. The prevalence of thinness in the rural areas ranged from 24.5 to 31.5 percent among males as compared to 14.6 to 15.8 per cent among females. Stunting in urban areas ranged from 6.5 to 15.2 per cent among males and 7 to 14 among females. Thinness was more prevalent among males than females in urban areas and it ranged from 21.9 to 34.1 per cent among males and 11.5 to 19.8 per cent among females. The prevalence of stunting and thinness was more in rural than in urban settings for both the sexes but the difference was not statistically significant. The overall nutritional status among the rural subjects was poor than that of the urban subjects for both the sexes. Chocklingam et al., (2011) studied geographic variations of BMI in India. They used the data from National Family Health Survey (NFHS-3) for women from 2005-06 to develop state-specific models of BMI and did inter-state comparisons. They also examined the individual versus contextual predictors of these variations. Of the total sample (N = 118,734), about 29 percent had a BMI lower than 18.5, with Uttar Pradesh having the highest number of underweight women followed by Maharashtra, West Bengal and Karnataka. North-eastern states of Arunachal Pradesh, Nagaland, Manipur and Mizoram, collectively had lowest percentage of underweight residents. Female respondents who had higher levels of education, married and employed had a lower prevalence of being underweight (p<0.000). Women who smoked and consumed alcohol were also more likely to be underweight. But addition of such individual level variables like income and wealth variables, educational and demographic variables and health behaviors alter the odds of having a low BMI in some states (such as Punjab, Kerala, Goa & Delhi) but not in others (such as Bihar, Jharkhand, Arunachal Pradesh, Nagaland, Madhya Pradesh & Manipur). In former types of states where individual level variables changed the odds of having low
BMI, continue divestments in education, health education targeted toward health-adverse behaviors and access to public health resources may show improvement in levels of BMI. Authors concluded that India needs two-pronged policy interventions to alter the BMI imbalance in India.

Subramanian et al., (2011) tried to assess if burden of underweight and overweight coexist among lower socioeconomic groups in India. Repeated cross-sectional analyses on nationally representative samples of 76,514 and 80,054 women aged 15–49 years drawn from the National family Health Survey II and III respectively was conducted. They calculated a ratio of the number of underweight women (18.5) divided by the number of overweight women (24.9). Indicators of socioeconomic status (SES) included wealth and education. Although the ratio of underweight to overweight women decreased from 3.3 in 1998–1999 to 2.2 in 2005–2006, there were still considerably more underweight women than overweight women. It was found that only in the top wealth quintile and in groups with higher education that there was a slight excess of overweight women as compared with underweight women. A strong positive relation between SES and body mass index at both time points and across urban and rural areas was recorded. The study revealed that distribution of underweight and overweight in India remains socially segregated.

Another important method to assess women’s nutritional status is dietary intake. There is wide literature on consumption of food items determining women nutritional status. Kawatra and Sehgal (1999) studied nutrient intake of lactating mothers from rural and urban areas of Hisar district in Haryana. A sample of 150 lactating women from urban areas of Hisar and 140 lactating women from two villages of Hisar were selected by simple random method. Dietary intakes were collected using 24 hour recall method for three consecutive days. Regarding consumption of foods from
various food groups, it was observed that intake of almost all the food groups except milk and milk products in urban and fats and oils in rural lactating mothers was low. It was also found that the income of the mothers was significantly associated with the intake of energy, protein, vitamin C and iron. Higher the income more was the consumption of these nutrients. The study revealed that nutrient intakes of most of the foodstuffs and nutrients were below the recommended dietary intake (RDA).

The effect of maternal nutrition has a direct effect on low birth weight babies. A sample of 1048 live births in Rajender Hospital, Patiala, was selected to assess the nutritional status of mother by weight to height product index. Out of 1048 babies, 200 were found to be having low birth weight thereby giving an incidence of 19.1 percent. Incidence of LBW was higher among female babies (19.6 percent) as compared to male babies (18.7 percent) (Sharma et al., 1999). They further reported that lowest incidence of low birth weight babies (17 percent) were observed in mothers having Hb10gm/dl or more and there was improvement in birth weight as Hb level increased. They concluded that incidence of LBW babies was highest (34.5 percent) in mothers weighing less than 45 kg and lowest (8.3 percent) in mothers weighing 60-64 kg. Incidence of LBW was maximum (26.6 percent) having height less than 150 cms. Another study considered the nutritional status of rural pregnant women in a CD block Sarojini Nagar of Lucknow. The Study was conducted on 400 pregnant women who had less than 28 weeks of foetus at the time of registration and tried to assess their nutritional status through prevalence of different grades of anemia and average weight gain during the time of pregnancy. It was found that overall 23.3 percent women were having BMI less than 18.5kg/m² and average weight gain during pregnancy was 6.6 kg. About 38 percent women were found to be anemic in the sample and 29.5 percent women were found to be consuming calories less than recommended dietary intake (Saxena et al, 2000).
Despite progress in food production, disease control, economic and social development, women and children sub-group of population continue to suffer poor nutritional status. Economic Prosperity alone cannot be sufficient for good nutritional status of population. Duggal (2002), in a study conducted in Maharashtra found that more than half of the total households both in rural and urban areas received less than prescribed adequate amount of calorific intake and situation worsened in rural areas in last 20 years. Jood *et al.*, (2002) studied nutritional status of 90 rural pregnant women belonging to arid (Bhiwani), semi-arid (Hisar) and wet categories (Kurukshetra) of Haryana. Recording of food intake by pregnant women was done for three consecutive days. They found that intake of cereals, pulses, roots, vegetables, sugar and jaggery by pregnant women were significantly lower than prescribed Indian recommended dietary intake (RDI). It was found that consumption of milk and milk products was significantly higher than RDI. Authors documented in their study that despite poor intakes women height and weight were not much below standards and only 1/4rth of the total women were found to be underweight. A cross-sectional study by Kaur and Kochar (2009) was undertaken on 600 Jat women (rural=300, urban=300), aged 40 to 70 years. They tried to determine the prevalence of anaemia and the dietary intake among rural and urban middle-aged (40-59 years) and older (60 & above) Jat women. Their findings indicated that all women exhibited a decline in the mean values of hemoglobin (Hb) concentration with advancement in age. The mean blood Hb concentration of urban middle-aged and older women was 10.1±1.3g/dl and 9.9±1.4g/dl respectively, which was higher than their rural counterparts at all age groups. The overall prevalence of anaemia reached 88.7 percent (rural women = 91.3 percent, urban women = 86 percent). Daily dietary intakes of rural and urban subjects were below the recommended dietary allowances (RDA). A significant and positive correlation of Hb status
was observed with grip strength and vital capacity while a negative association was witnessed with blood pressure and pulse rate in both the rural and urban women. Malhotra and Passi (2007) assessed the diet quality and nutritional status of rural adolescent girls who were beneficiaries of ICDS in rural North India by surveying 209 girls from six rural blocks of Delhi, Haryana, Rajasthan and Uttar Pradesh. Their findings indicated that dietary intake met only $2/3$ to $3/4$th of the energy, protein and micronutrient energy requirements. Nearly 31 percent of the subjects were found to be thin and equal number of them was found to be stunted. They suggested that implementation of new innovative programmes was necessary to address the nutrition and health needs of rural adolescent girls to break the intergenerational cycle of malnutrition. Another study on diet and nutritional status of women in India was undertaken by Mallikharjuna et al., (2010). They based their study by using the data collected during 1998-99 and 2005-06 on diet and nutritional status of tribal and rural population in nine States of India (Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamilnadu and West Bengal) by National Nutrition Monitoring Bureau. The intake of all the foods except for other vegetables and roots and tubers was lower than the suggested level among rural as well as tribal women. The study revealed inadequate dietary intake, especially micronutrient deficiency (hidden hunger) during pregnancy and lactation. The prevalence of goiter was relatively higher (4.9 percent) among tribal women compared to their rural counterparts (0.8 percent). Tribal women were particularly vulnerable to under nutrition compared to women in rural areas. The prevalence of chronic energy deficiency was higher (56 percent) among tribal NPNL women compared to rural women (36 percent).

The basic facts about growth, poverty and nutrition in India had been well documented by Deaton and Drèze (2009). They found strong evidence
from various nutrition surveys that there was a decline in per capita calorie consumption in last twenty five years especially in rural areas. The proportionate decline was larger among better-off sections of the population, and close to zero for the bottom quartile of the per-capita expenditure scale. The decline of per-capita consumption is not limited to calories. It also applies to proteins and many other nutrients, the only exception is fat consumption, which has increased steadily (in both rural and urban areas) during this period. They concluded that some of the calorie decline may come from a better health environment or a reduction in the burden of hard labor, each of which is a positive development in its own right. There is an urgent need for better nutrition monitoring arrangements in India and to link these surveys like DLHS and NFHS with NSSO surveys from time to time to combine detailed nutrition data with household expenditure data. Another study was conducted on agriculture, food security and nutrition in Vidarbha at household level. The study was based on an assessment of agricultural practices and livelihoods of people in Vidarbha. Data used in the study was generated from a baseline survey on a sample of 6,990 households covering six districts. It was found that under-nutrition does not differ much between different socioeconomic groups. Households with large cultivated holding are no better than households with small or marginal cultivated holding or even landless households in containing under-nutrition among children, adolescents and ever-married women. Per capita income of households reflected the same pattern of relationship with nutritional status. The relationship is that other things being equal, the higher the expenditure on food items, lower the proportion of children, adolescents and ever married women undernourished. With respect to the relationship between agriculture and nutrition the data indicated that the higher the food crop production, lower was the under-nutrition (Parasuraman and Rajaretnam, 2011).
1.2.2 Factors Affecting Nutritional Status

A large number of factors affect nutritional status of women; prominent among them is poverty, gender bias, social and economic status of household. Under nutrition, is often considered as both outcome and manifestation of poverty. “Being poor” almost always means being deprived of full nutritional capabilities (Osmani, 1992) In an analysis of malnutrition among young children in Punjab, Levinson (1974) found gender to be the most statistically significant determinant of nutritional status where male-female differentials in nutritional status were especially higher among the lower social caste group. Nutritional status among the higher, land-owning caste was better on the whole and the gender differential was also smaller. In times of extreme food scarcity, female access to food is less than that of males. A survey of some flood-hit West Bengal villages in 1978 showed that females of all ages up to 72 years had higher rates of malnutrition than males (Kynch and Sen, 1983). The NNMB's dietary intake survey (1980) documented lower food consumption in households without land compared with landowning households; among labourers and others (village artisans and petty businessmen), compared with cultivators; and among Scheduled Castes and Tribes, compared with non-scheduled groups (NNMB, 1980).

Bias in food allocation within family leading to higher female mortality had been pointed out in a study of rural Bangladesh by Chen, Huq and D'Souza (1981). Their study reported a higher degree of female malnutrition for all ages and argues that son preference, bias in intra-family food allocation and poor utilization of health services contributes towards higher female mortality. In another study of two villages in West Bengal by Sen and Sengupta (1983), demonstrated that in developed village with the proportion of people owning land increased resulted in lowering of undernourishment among 0-5 year olds but in the same village sharper gender differentials in
anthropometric status were observed as only boys nutrition improved, while girls nutrition in this village remained on par with that of girls in the "underdeveloped" village. They further concluded that the economic benefits are limited to boys. Poverty, unequal distribution of food, resources and power in the household are the major cause of her malnutrition (Zurbeigg, 1984). Girl infants are breastfed less frequently, for shorter durations than are boys (Das et al., 1982; Ghosh, 1985; Khan et al., 1983), and this situation prevails more among the poor for social and economic reasons. McNeill (1984) in his study of Tamil Nadu found that while male children were breastfed for five months longer than female children on the average, male children in landed families were breastfed almost ten months more than female children in agricultural labour households. Several studies have brought out that social norms restricting women’s freedom, autonomy and discriminatory practices in the intra household resource allocations against women are relatively intense in northern region of India (Miller 1981, Chen 1995). In a study on rural Punjab by Dasgupta (1987) also revealed the gender differential in food consumption among children (0-4 year) and was higher among landed than among landless families. Poverty is a more responsible factor for poor health and nutrition of females than sex discrimination (Gopalan, 1989). A study by Chatterjee (1989) reveals that gender differences in the adult population nutritional status increases due to poverty. Socio-economic factors such as illiteracy, poverty and wrong beliefs are some of the major factors for for poor nutritional status of women (Sharma et al., 1999). Similarly, low socio economic status, illiteracy and low body mass index were found to be associated with higher prevalence of anemia in Haryana (Malhotra et al., 2004). Marriage in a farming family is also a cause of thinness (BMI less than 18.5) among women in rural Maharashtra (Barker et al., 2006). In a study on Orissa, women nutritional status was found to be positively related with education of women and her husband, husband occupation and household standard of living (Rout 2009). Vashist et al., (2009), quoted rural urban
differences in their study that was based on Rohtak district of Haryana where nutritional status of rural adolescent girls was reported to be poor than their urban counterparts. In another similar study by Kaur and Kochar (2009) on anemia among rural and urban Jat women in Haryana found dietary intake, illiteracy and poor access to health care services as the major cause for the prevalence of anemia. It is clear from the above discussion that a large number of factors explain the patterns of women nutritional status in India.

1.2.3. Women Health

The founding of the World Health Organization was accompanied by the famously broad and much cited definition of health ‘as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity’ (WHO, 1948). This use of ‘wellbeing’ was aimed to re-conceptualize health and health care practices away from a focus on the individual and absence of specific diseases towards seeing health as a positive attribute. Smith (1973) did one of the most pioneering works on social well being and provided a geographic understanding of selected and contemporary problems of North America such as poverty, health care delivery, environmental quality and quality of life. He concluded that rural poverty and inner city social problems produce low levels of well being. McGlashan (1973) laid emphasis that geography and medicine shares a common area of interest. He stressed three variables climate, site and occupation. Climate and site corresponds to physical geographical factors and occupation of population is related to human social geography. Geographers of health have done much to emphasize the importance of relationships between health and the places and spaces which produce and reproduce experiences of health or are constructed through policy to respond to ill-health (Jones & Moon, 1993; Litva & Eyles, 1995; Kearns & Moon, 2002). Contemporary research includes identification of determinants of spatial inequalities in health (Graham, 2000;
Curtis et al., 2002, 2004; Boyle et al., 2004; Fagg et al., 2006). Gender disparities in social well being were documented by Datta and Sinha (1997). Their study identified gaps in current research on social well being and suggested new areas and methods of analyzing the question of social well being with reference to problem of gender inequalities. Aninidita Datta (2003) laid stress that gender disparities in the sphere of health are the direct consequence of gender discrimination in other spheres of social well-being. Study suggested that any policy targeting women's health must recognize that women's health outcomes are invariably linked to other aspects of their lives and to their unequal social positions. Study recommends a comprehensive women's health policy based on a life-cycle approach to significantly improve the health status of girls and women.

World Health Organization has laid stress on women health as she is the most vulnerable group of society. For social and biological reasons, women of the reproductive age are amongst the most vulnerable to malnutrition and poor health (UNACC/SCN, 1992). Various conferences, seminars and studies in different parts of world with special reference to women health are organized by this world organization. The focus of the World Development Report (1993) was health. The report used a “global burden of disease" model to quantify the loss of healthy life from about 100 diseases and injuries in 1990. To measure the total burden of diseases, including death and disability, the Report used the disability-adjusted life years (DALYS) which combine healthy life years lost from premature mortality with those lost from disability. Another important finding was that for many of the major burdens of disease in women aged 15-55, there are highly cost-effective interventions to address those problems in contrast to the major disease burdens for men of the same age group. Some of those findings are the driving force behind the World Bank move for women's health and nutrition programmes.
The Platform for Action of the Fourth World Conference on Women in Beijing (1995) emphasized a holistic and life cycle approach to women’s health. In addition to tackling the problems caused by harmful social and economic policies, the platform targeted the discrimination and gender inequalities that underlie women’s health. The conference put forward all the problems related to women on one stage and its main objectives were to eliminate all kind of discrimination against girl child in education, skill development, health and nutrition as well to eliminate negative cultural practices and attitudes against girls. It was also stressed at the conference that governments should promote and protect the rights of girl child and increase awareness of her needs and eliminate violence against her as well strengthen the role of her family in improving the status of girl child. The foundations for the Beijing Platform were laid at the International Conference on Population and Development that took place in Cairo in September, 1994 addressing women’s right to control all aspects of their health and affirming the equality of the relationship between women and men in sexual relations and reproduction (UNFPA, 1999). The Convention for the Elimination of All Forms of Discrimination against Women (CEDAW) provided a legal framework for the promotion of gender equity in health and reproduction as well as in social and economic life.

World Health Organisation (1996) examined the indicators of women health status in India and analysed the factors affecting women’s well being such as women health, education and nutrition. This report identified strategies for improving the health and nutrition of Indian girls and women. The report came out with conclusions that focussed efforts are needed to improve the health and overall status of females which will provide substantial benefits in terms of human welfare, poverty alleviation and economic growth. World Bank (2007) documented the global, regional and
country estimates of maternal mortality rate in 2005 and found separate assessment of trends in maternal mortality levels since 1990. It summarized the challenges involved in measuring maternal mortality (MMR) rate. The report came out with the findings that about 5,36000 maternal deaths occurs worldwide and the developing countries accounted for 99 percent deaths (5,33000) and more than half of maternal deaths (2,70000) occurred in sub Saharan Africa followed by south Asia (1,88000). The report further indicated that to achieve 5th millennium development goal it is necessary to reduce MMR in sub Saharan Africa at a much faster rate where annual decline in MMR is 0.1 percent only.

Women’s health status in terms of her reproductive health needs that spans from childbirth and its associated factors has also been studied by various researchers. In a study on women’s health of rural poor population in Tamilnadu by Ravinderan (1991) with secondary and primary data had found that burden of illness borne by women was very high. In landless families, children especially girls drop out early from school and join the labour force or manage the households. It was further concluded that inadequate nutrition and heavy manual labour on land caused high pregnancy wastage in women. Women’s participation in the labour force increases the risks of morbidity. Another study documented the extent and nature of reproductive health problems and their management in a rural population of Haryana. The study revealed that 55 cases of maternal mortality in six rural areas for a rate of 230/100,000 live births. Only 31 percent of the women died in hospitals (38 percent died at home or in transit to the hospital) and 64 percent were not referred (ignorance was the reason for non referral in 54 percent of the cases). In the same study another survey was a cross-sectional look at the reproductive health of 600 married women aged 15-44 years in 4 different villages. The results revealed that about 61 percent of the women suffered
from gynecological disorders. Gynecological services were offered in conjunction with this survey and 225 women were given treatment. Of the 228 women who had delivered during the previous 2 years, about 45 percent of them experienced maternal morbidity and 19 percent suffered from a major complication. Private doctors were consulted in 43 percent of the cases and the others were treated by government doctors (29 percent), health auxiliaries (16 percent) and midwives (12 percent). Most of the women received prenatal care and 21.8 percent had induced abortions (Kumar et al., 1995). The study revealed that community-level reproductive health education should take place and round-the-clock services should be available in rural areas to deal with maternal emergencies.

Similarly, Aggarwal et al., (1999) studied the pattern of reproductive tract infections among ever married women in reproductive age group in rural area of Haryana. It was estimated that 70 percent of women were suffering from reproductive tract infections. Mutharayappa (2006) in his study of reproductive morbidity of women in Karnataka highlighted the extent of their reproductive health problems and the factors responsible for increasing reproductive tract infections (RTI) cases in them. They emphasized on the relationship between age at first delivery or ‘child birth’ and the reproductive morbidity of women. Reproductive morbidity due to abortion was high among rural women and fewer than half the women who reported gynecological problems did not seek treatment. Mewat is a backward area of north India. Illiteracy, unhealthy lives, burden of frequent pregnancies, strong traditional culture and practices put the Meo women at higher risk of acquiring Reproductive Tract Infections (RTIs). A community based cross-sectional study among married women (between 15 and 49 yrs) was undertaken in Mewat which tried to understand the socio-demographic and socio-cultural factors that increase vulnerability to RTIs among women. Results revealed
that 72.6 per cent of the respondents reported one or more symptoms of RTI. Only 31 per cent of the respondents were aware about RTI and 21 per cent about HIV/AIDs. Bivariate analysis indicated statistically significant association between educational level, age at marriage, place of delivery and awareness about RTI with presence of self-reported symptoms of RTI among the study population (Shrivastava, 2010). The concept of reproductive health emerged in 1980’s and offered an alternative public health perspective for understanding reproductive health. Within reproductive health, priorities should be clearly articulated and this should be seen in the budgetary allocations (Qadeer, 1998). Maternal and child health, nutrition, contraceptive services and communicable disease control must be integrated and this will give a solid foundation to women health including her reproductive health.

Many researchers have reviewed disease burden among rural Indian women utilizing the data from survey of cause of death (rural), annual reports of RGI, India and NFHS II, revealed that bronchitis and asthma are the leading cause of death among rural women. Most of the maternal deaths are concentrated in 20-24 age groups and excessive bleeding is the main cause of maternal deaths. Tuberculosis, malaria and burns are important cause of death in early reproductive ages while rate of suicide, burns and anemia diminishes with age (Ramana kumar, 2004). There are not only biological factors but social, economic, cultural, occupational and political factors which also affect women health.

The easy availability of health care infrastructure affects women’s health, which has been shown by a large number of studies. In one such study on Haryana of 389 households spread over eight villages of rural Haryana, revealed that non-availability of public health care facilities (HCFs) at the place of habitation adversely affected the health status of women especially those who belongs to lower economic categories. The availability of public
HCFs not only reduces sex disparity but it also helps in improving the medical intervention during ailment for those, which are at the bottom economic stratum of society. The cross district analysis proved that inter category variations are less in the economically better developed areas coupled with location of HCFs at the place of habitation (Rajeshwari, 1996). Similarly, another study assessed the impact of health care center availability on the utilization of maternity care services and pregnancy outcomes in four villages of Ambala district in Haryana. Six hundred married women with a delivery in previous two years were interviewed. One village had a primary health center, one had a sub center and two did not have a health center but were within 5 km of such a facility. Overall, 98 percent of respondents had contacted health staff for antenatal care. High awareness of modern maternity care, defined as knowledge of more than 3 components of antenatal care was present in about 10 percent of respondents in the village having health center, 22 percent in the village having sub center and 15 percent in villages without a health center. About 50 percent of deliveries in the primary health center village, 76 percent in the sub center village and 76 percent in those without a health center were performed by a traditional birth attendant (TBA). Preference for a TBA-assisted delivery was expressed by 15 percent, 33 percent and 36 percent of respondents respectively. Both preference for and use of TBAs were lower among women with high awareness of the components of antenatal care. These findings indicated that awareness of and access to a health center equipped with modern maternity facilities has a significant positive impact on the health-seeking behavior and pregnancy outcome of rural women (Kumar et al., 1997). Another study attempted to find the relative importance of demographic and economic factors in utilization of maternal health care in India by using rural data from 32,000 households belonging to 1765 villages across India (collected by NCAER in 1994). It was found that in India
utilization is significantly affected by mother’s education level and family composition. Women’s exposure to information through radio, television etc. also significantly increases utilization rate of these services. Economic factors such as wages and income are important only for child delivery services (Shariff and Singh, 2002). Access to local available health services significantly increases maternity use. ICDS in this respect also plays important role.

Antenatal care is an important aspect of safe motherhood programme. In a study on utilization of antenatal care services in Rajasthan, using data from NFHS I it has been tried to find out the possible reasons of low utilization of antenatal care services in the state. The coverage of health services is not less though some physical obstacles do exist in terms of accessibility. Various factors such as socio-economic and cultural background of the women, her literacy are the few factors, which play important role. Certain population groups such as scheduled castes and tribes and economically backward groups need special attention in Rajasthan (Mondal, 1997). Another study which is associated with the use of antenatal care in rural North India found that about 3/5th of rural women did not receive any ANC during their last pregnancy. Antenatal service predominately includes tetanus toxid vaccines and iron-folic acid tablets. Only 13 percent females had their blood test done once in India. Women who were visited by health workers received fewer services compared to women who themselves visited health facility. It was also concluded that home visits were biased towards households with better living standards. Average no. of ANC visits reported in study area was about 2.4 and most of the visits were in third trimester (Pallikadavath et al., 2004).

There are many factors contributing to women obtaining antenatal care services in India and reflects on how ANC services could influence the
decision regarding the place of delivery. A cross sectional survey of 5344 rural pregnant women with a gestation of more than 4 months across 28 districts revealed that 74 percent had one antenatal contact with ANM during their gestation and there is a substantial reduction in the percentage of women obtaining ANC with increasing age, parity and number of children (Chandihok et al., 2006). The study further revealed that about 52 percent of women who availed ANC facility preferred institutional delivery as compared to 28 percent of those who had not availed ANC services. Another study on urban area of Punjab explored the utilization pattern of antenatal care (ANC) services among the pregnant women. The study was based on primary survey (from June 2002 to May 2003) conducted on mothers admitted for delivery in a major secondary care hospitals in urban Patiala. There were a total of 1694 pregnant women admitted for delivery. About 78 percent of the pregnant women had availed 3 or more ANC visits, 96 percent of them received two tetanus toxid booster doses, while 47 percent of the pregnant women had IFA tablet supplementation for 3 or more months. Only 22 percent of the pregnant women received recommended full package of ANC. Literacy of women and socioeconomic status had a significant effect on increasing full ANC coverage (Satija et al., 2010).

A large number of studies have tried to assess the women health status using holistic approach. Hiwarkar et al., (1998) attempted to study the health status of rural population in village Mahgaon, Nagpur, Maharashtra. Overall 850 individuals were surveyed, out of which 53 percent were males and 47 were percent females. They studied the mean height weight of males and females in all age groups upto 21 years and found that it was less than ICMR standards. Mean Hb values of individuals in different age groups were found to be significantly lower than the values recommended by W.H.O. They further reported that some morbid conditions in rural population were due to
poor nutrition and deficiencies such as anemia (22 percent), Vitamin A deficiency (12 percent), Vitamin b-complex (10 percent) and PEM (8 percent) were prevalent. Low socioeconomic conditions, limited availability of food, poor communication facilities, unsatisfactory living conditions, inadequacies in health are some of the factors responsible for poor health of rural population.

Deswal et al., (1999) studied the overall prevalence of low birth weight babies amongst hospital births in Meerut city, Uttar Pradesh and identified and quantified the effect of some risk factors for low birth weight. In a sample of 491 low birth weight babies and equal number of normal weight babies were picked up from hospitals in Meerut and cross classified the data on the basis of maternal age, sex of baby, birth order and institutional delivery. It was found that overall proportion of low birth weight babies was about 22 percent among hospital live births and about 31 percent LBW babies were born to mothers with age less than 20 years of age. They concluded that low maternal weight, under nutrition, lack of antenatal care, short inter pregnancy interval and toxemia of pregnancy were factors which increases the risk of low birth weight significantly. An attempt has also been made by Sidramshettar (2004) to assess the health status of women in Karnataka. He analyzed data from NFHS II carried out in Karnataka covering 4,374 women between 15-49 age groups. Important indicators of women health viz, age at marriage, infant and child mortality and nutritional status of women were undertaken for the study. It was found that very early marriage (by age 13) has virtually disappeared in both urban and rural Karnataka but still 58 percent in rural Karnataka and 26 percent women in urban Karnataka got married below the age of 18. He further discussed infant mortality rate in Karnataka and infers that IMR was 41 percent in rural areas while it was two and a half times less in urban areas. IMR in Karnataka declines with
increasing education of mothers and IMR was found to be high among Hindus than Muslims. It was reported that about 39 percent females in Karnataka have prevalence of nutritional deficiency and it was found high among younger, rural, illiterate women living in households with a low standard of living. Similarly, Kumar and Khan (2010) using NFHS III data studied health status of women in India. They laid stress on five key factors of women health in their study, reproductive health, violence against women, nutritional status, unequal treatment of girls and boys and HIV/AIDS. Wide variation in cultures, religions and levels of development among Indian states and union territories results in immense variation of women’s health from state to state. They also suggested that many of the health problems of Indian women were related to their high levels of fertility.

Fertility has an impact on women health as high fertility means longer reproductive span and women exposed to disease for a longer period. The data derived from Bangladesh fertility survey (1989) and the Bangladesh demographic and health surveys (1993-94; 1996-97) investigated by Kabir et al., (2001) suggested that using children ever born as measures of fertility had lower age at marriage which resulted into higher fertility. Another finding, which comes out to be, is that age at marriage in Bangladesh increased with higher socio-economic conditions. Female education in Bangladesh appears to be strongest determinant of variation in age at marriage and all other factors such as place of residence, work status, religion and geographic region plays statistically insignificant relationships. Jenson and Thorton (2001) studied patterns and trends in early female marriages in developing countries and found the trend to be quite high (70 percent) in South Asia as compared to S-E Asia (30 percent). It was found that women who got married in young age tend to have less education, begin child bearing earlier and has less decision making at home as well as faces domestic violence also. A study conducted in
India by Guilmoto and Rajan (2002) using census data of 2001 estimated the
district wise total fertility rate in India and came out with the conclusion that
India is passing through the last phase of fertility transition and moving
towards moderate to low fertility but this is not universal in India. The study
further stated that below replacement levels are found in Tamil Nadu, Kerala,
South Karnata and some parts of Goa. High fertility categories (5 children
per women) are still widespread in north India.

1.2.4. Factors Affecting Women Health Status

The girl child in India is continuously at risk and which is quite evident
from skewed child and adult sex ratio. According to 2001 census, in north
Indian states especially in Haryana, Punjab and Himachal Pradesh, sex ratio is
at its worst. In these regions the discrimination against girl child is systematic
and continuous. Gender discrimination and son preference is prevalent in the
society which can be easily understood through poor sex ratio. Miller (1981)
in her work “Endangered Sex : Neglect of Female Child in Rural North India”
suggested that the role of cultural practices, like the high costs of dowry and
the prospect of old age care and protection by sons, are the main reasons for
the prevalence of female neglect in the region. Large number of other studies
also reveals son preference for various reasons such as financial support, old
age security, property inheritance, family ancestry, prestige and power, birth
and death rituals and beliefs about religious duties (Dyson & Moore 1983,
Basu, 1989; Kishore, 1993) due to which negligence towards survival or
existence of women increases in the society. Further the disparity exists in
neonatal and post natal mortality rates by sex. A large number of studies have
documented high female mortality in these periods (Abel, 1987; Das Gupta,
1987; Kishor, 1993). A study on women health in Andhra Pardes estimated
about 36 percent of all deaths among females aged 15-49 in the reference
period were caused by complications of childbirth. This study also found that in almost one-fourth of the deaths, family members were not aware of the seriousness of the woman's condition and took no action to obtain assistance (Bhatia 1988). In India, utilization of basic health services has remained poor even though there has been increasing public and private expenditure on the provision of advanced health care. The low utilization seems to be due to low levels of household income, high illiteracy and ignorance and gender discrimination in access to health care is all pervasive (Shariff, 1999). Utilization of maternal health care services is affected by mother education level and family composition (Sharriff and Singh, 2002).

In India, a range of cultural factors influence the pregnancy, childbirth and childcare practices. Pregnancy is looked upon as a condition that does not require medical attention (Shariff, 1993). Mondal (1998) emphasized on cultural background of women and her literacy status to be an important factor in utilization of antenatal care in Rajasthan. Nielsen et al., (2001) recorded that high utilization of antenatal care facilities was associated with adverse obstetric history, short distance to healthcare facilities and literacy in a rural population in Tamil Nadu. There had been significant association between knowledge regarding health and nutrition and age of respondents, education, family occupation and family size Aneja and Chikhara (1994).

Utilization of maternal services in rural areas is mainly driven by socio economic factors such as media exposure, standard of living and education and much less by physical access and availability of health care and family welfare services (Das et al., 2001). Similarly, Satija et al., (2010) noted significant effect of literacy and socio-economic status of household on receiving full antenatal coverage in Punjab. Sidramshettar (2004) reported rural women with low education and poor standard of living have poor health in Karnataka. A similar study conducted in Uttar Pradesh reveals that low maternal weight, under nutrition, lack of antenatal care and short inter
pregnancy interval led to poor women health (Deswal et al., 1999).

Poor sex ratio, son preference for various reasons, high morbidity and mortality rates among women, poor access and utilization of health services influence the poor status of women health in India. All these indicators have an impact of various socio-economic factors such as education levels, occupation of the household, media exposure and distance from health care facilities and standard of living of the household.

Hence it may be noted that issues of women’s health and nutrition have been well documented, yet most of the times these have been studied in a spatial perspective. In this view, present study attempts to attain the following objectives:

1.3 Objectives
1. to study the spatial patterns in levels of women’s nutrition and the extent of its variation in relation to socio-economic conditions of the households.
2. to obtain a pattern of women’s health status in preventive and curative care in relation to caste, educational and economic characteristics of sample households.
3. to evaluate the efficacy of various health and nutrition intervention programmes of center and state government in the sample study area.
4. to extract the determinants of women’s health and nutrition in the sample study area.

1.4. Study Area

The state of Haryana, bifurcated from Punjab in 1966, is an agricultural state as two third of the population is engaged in agriculture (Economic Survey of Haryana,). Haryana constitutes only 1.44 percent of total geographical area of the country yet it contributes substantially high percentage to India’s total food production. Haryana has made a considerable progress in economic
spheres in recent decades which reflect from its high per capita income. Yet, socially and demographically Haryana accounts in less developed states of India. According to census 2011 sex ratio (total) in Haryana is 877 females per 000 males while in rural Haryana it is 880 females per thousand males. Child sex ratio in Haryana is 830 per thousand males and in rural Haryana it is only 831 females per 1000 males. Literacy is an important parameter reflecting development of a region and overall female literacy rate in Haryana is 66.8 percent while it is 60.97 percent in its rural areas (census 2011). It shows that about half of the total rural women are illiterate. According to 2011 census, gender gap in literacy in Haryana is 18.6 percent but it is wider in rural Haryana (22.3 percent).

Early marriage is likely to have adverse physical consequences for adolescent girls and it is also a cause of many nutritional disorders. According to 2001 census in Haryana median age at marriage for females is 18.0 but in rural Haryana median age at marriage for females is 16.9 only. In rural Haryana about 52.4 percent females got married below the age of 18 and enormity of problem lies in that 28.6 percent female got married below the age of 15. Low age at marriage results into high fertility rate and according to 2001 census total fertility rate in Haryana is 3.4 children per women whereas it is 3.5 in rural Haryana. According to NFHS III (2005-06) in Haryana women who were having BMI less than 18.5 were 31 percent while rural Haryana displays more acuteness and 36 percent women have BMI less than 18.5. In Haryana among reproductive age (15-49) maximum females of 15-19 age groups (46 percent) were found suffering from chronic energy deficiency (BMI less than 18.5).

According to Mortality Statistics in India: A Report 2006, CBHI (Central Bureau of Health Intelligence), in Haryana, total infant death share is about 21.7 percent out of the total deaths. According to NFHS III (2005-06),
in rural Haryana 46 percent women receive antenatal care in first trimester while almost 54 percent women received three antenatal care. According to District Level household Survey II (2002-04) and III (2007-08) in rural Haryana full antenatal care services were received by only 10 percent women. NFHS III (2005-06) also reported that only one-fourth of the total deliveries in rural Haryana are institutional. The indicators discussed above are the few indicators which indicate the health status of women in Haryana which by no means can be termed healthy.

1.5. Data Base

Present study is based on both secondary and primary sources of data. The district wise data was primarily dealt with secondary sources of data available from various sources such as Census of India 2011 and 2001, Office of the Registrar General of India, 2001, District Level Household Survey I (1998-99), II (2002-04), Ministry of health and family welfare, Govt. of India, New Delhi, National family Health Survey I, II, III Haryana 1992-93, 1998-99, 2005-06, Report from Central Bureau of Health Intelligence, Nirman Bhawan, New Delhi, Directorate of Census Operations, Haryana (socio-cultural tables) C-series, (fertility tables) F series, Vital Registration Statistics and Sample Registration system.

1.6. Sample Design

The data on women nutrition and health status of women was primarily obtained from primary survey. For this multi stage sample design was adopted. Women health and nutrition is the direct outcome of food and influenced by availability of food. In order to assess the availability of food and nutrition, regional variations within Haryana in terms of agricultural productivity has been considered as an indicator to broadly classify the agricultural categories in the state. Studies revealed that Haryana despite
being a surplus food grain producing state still exhibits remarkable spatial variations in food grain production (Sindhu, 2004). Taking agriculture productivity as an indicator of availability of food, the states may be divided into four distinct agriculture developed categories (Table 1.1).

**TABLE 1.1**  
AGRICULTURALLY DEVELOPED DISTRICTS OF HARYANA.

<table>
<thead>
<tr>
<th>Agriculturally Developed Districts</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Developed (Category I)</td>
<td>Fathabad, Kurukshtera, Yamunanagar, Kaithal, Karnal</td>
</tr>
<tr>
<td>Developed (Category II)</td>
<td>Panipat, Sirsa, Ambala, Jind, Hisar</td>
</tr>
<tr>
<td>Moderately Developed (Category III)</td>
<td>Faridabad, Sonipat, Mahendergarh, Rewari, Gurgaon</td>
</tr>
<tr>
<td>Low Developed (Category IV)</td>
<td>Rohtak, Jhajjar, Bhiwani, Panchkula</td>
</tr>
</tbody>
</table>


This is based on the assumption that health and nutrition of women is also determined by awareness and knowledge regarding nutritious food and their dietary behavior. At second stage, rural female literacy has been taken as another indicator for choosing sample villages. Now from each category, one village was taken from the tahsil which had highest rural female literacy and another from the tahsil which had least female literacy. In total eight villages, two from each category were selected. The location of sample villages had been presented in fig. 1.2. In these eight villages, 487 households were
Figure 1.1

HARYANA
Districts on the Basis of Agricultural Development
2004

<table>
<thead>
<tr>
<th>Category</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villages</td>
<td>Baliyala</td>
<td>Nagla</td>
<td>Khardwal</td>
<td>Rajoo kheri</td>
<td>Mhd.pur Ter</td>
</tr>
<tr>
<td>Total house holds in sample villages</td>
<td>691</td>
<td>398</td>
<td>676</td>
<td>400</td>
<td>598</td>
</tr>
<tr>
<td>Total house holds surveyed</td>
<td>71</td>
<td>46</td>
<td>67</td>
<td>45</td>
<td>63</td>
</tr>
<tr>
<td>Total population surveyed</td>
<td>368</td>
<td>225</td>
<td>427</td>
<td>241</td>
<td>497</td>
</tr>
<tr>
<td>Total male surveyed</td>
<td>182</td>
<td>118</td>
<td>226</td>
<td>129</td>
<td>259</td>
</tr>
<tr>
<td>Males (0-1)</td>
<td>10</td>
<td>10</td>
<td>18</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Males (1-5)</td>
<td>27</td>
<td>12</td>
<td>29</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>Males (0-14)</td>
<td>66</td>
<td>37</td>
<td>83</td>
<td>35</td>
<td>131</td>
</tr>
<tr>
<td>Males (15-59)</td>
<td>99</td>
<td>73</td>
<td>122</td>
<td>78</td>
<td>109</td>
</tr>
<tr>
<td>Males (60+)</td>
<td>17</td>
<td>08</td>
<td>21</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Total females surveyed</td>
<td>188</td>
<td>107</td>
<td>201</td>
<td>112</td>
<td>238</td>
</tr>
<tr>
<td>Females (0-1)</td>
<td>17</td>
<td>11</td>
<td>9</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Females (1-5)</td>
<td>18</td>
<td>10</td>
<td>30</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>Females (0-14)</td>
<td>68</td>
<td>36</td>
<td>70</td>
<td>30</td>
<td>138</td>
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<tr>
<td>Females (15-49)</td>
<td>100</td>
<td>55</td>
<td>99</td>
<td>63</td>
<td>85</td>
</tr>
<tr>
<td>Female (15-59)</td>
<td>108</td>
<td>66</td>
<td>111</td>
<td>73</td>
<td>88</td>
</tr>
<tr>
<td>Female (60+)</td>
<td>12</td>
<td>05</td>
<td>20</td>
<td>09</td>
<td>12</td>
</tr>
<tr>
<td>Caste Groups</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
<td>All Village</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-------------</td>
</tr>
<tr>
<td>First ranking caste</td>
<td>02</td>
<td>02</td>
<td>04</td>
<td>03</td>
<td>Nil</td>
</tr>
<tr>
<td>Second ranking caste</td>
<td>33</td>
<td>30</td>
<td>43</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>Third ranking caste</td>
<td>02</td>
<td>07</td>
<td>11</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Fourth ranking caste</td>
<td>34</td>
<td>07</td>
<td>09</td>
<td>15</td>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education Levels of the Head of the Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
</tr>
<tr>
<td>Below primary</td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>Matric</td>
</tr>
<tr>
<td>SS and above</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landless labourers</td>
</tr>
<tr>
<td>Cultivators</td>
</tr>
<tr>
<td>Small farmers</td>
</tr>
<tr>
<td>Large farmers</td>
</tr>
<tr>
<td>Services</td>
</tr>
<tr>
<td>Self Employed</td>
</tr>
<tr>
<td>Total Households</td>
</tr>
</tbody>
</table>
surveyed largely representing the socio-economic structure of villages. The households were selected using purposive sampling as the objective is to study the women’s health. Hence these were selected keeping in mind maximum numbers of women in 15 to 49 years of age in households.

It was decided to take those households where females in 15-49 age groups were available. A profile of sample villages in terms of households surveyed and their population had been presented in table 1.2. However, the choice of households represented the broad socio-economic set up of the villages shown in table 1.3.

1.7. Methodology

The primary data obtained through household has been analyzed at three levels. These are social status, education levels of the head of the household and economic status of the household. In order to relate the social status of the household with women’s health and nutrition, all households have been classified by the class affiliations. All caste groups were grouped into four social groups as reflected by caste hierarchy. This grouping is done on the basis of local social status these castes enjoy. Among first ranking caste the households belonging to those caste which have enjoyed higher social status and historically also ranked as upper caste. Castes included among first ranking caste are brahmins and baniyas. In second ranking caste group all those caste which are dominant landowning caste of the village are grouped together and includes the households of jat, yadav, kamboj, jat sikh, saini and meos. Third ranking caste includes the household of lohar, kumhar, nai, khati, gadariya, lilgar, mian, mirasi, telli and chimpi. Fourth ranking caste is traditionally lower in social hierarchy. Fourth ranking caste group consist of valmikis, chamar, dhanak, ramdasia sikh, majahbi sikh, oodh, bawariya and dooms. Educational level of the head of the household has been
classified into following categories: *illiterates* (who cannot read and write), *below primary* (literates but not primary as well as who have attained madarsa education), *primary* (primary but not middle), *middle* (middle but not matric), *matric* (matric but not senior secondary), *senior secondary and above* (senior secondary or any higher degree).

Economic status of the household has been measured by taking occupation of the head of the households as proxy variable. All households have been categorized into following groups - *landless labourers* – (with no land), *cultivators* – (with land) and further classified as *small farmers* (Upto 5.0 acres) and *large farmers* (Above 5 acres), *services* and *self-employed*. It may be noted that land in state have variations in productivity across the state. So, to bring all ownership holdings at par, the land holdings have been standardized based on land rent. Standardization was made with following formula:

$$\text{Standardized land} = \frac{\text{Land rent per acre in the village}}{\text{Highest land rent per acre}} \times \text{Land in acre}$$

Nutritional status of women has been measured by taking height and weight information of women in 15-49 age groups. This is popularly known as Body Mass Index. While calculating BMI of women in 15-49, the expectant mothers, were excluded as weight generally increases during pregnancy. Quetelet’s index or Body mass index was used which is as: $\text{BMI} = \frac{\text{Weight (kg.)}}{\text{Stature (m$^2$)}}$. BMI was calculated into three groups which is standard and is used by national level surveys while assessing nutritional status of women (NFHS I, II, III). These are (i) BMI less than 18.5 kg $m^2$ = Thin (ii) BMI 18.51 – 23.0 kg $m^2$ = Normal (iii) BMI above 23.0 kg $m^2$ = Obese.

It may be noted that Royal college of Physicians (1983), classified 23.8 and above as overweight for females. According to the standard international
definitions, overweight is defined as a body mass index of 25.0-29.9, whereas obesity is defined as a body mass index of 30.0 or higher. These cutoffs may be too high for Asian populations (Durenberger et al., 1998) and a WHO expert consultation in July 2002 has proposed BMI lower limit of 23 for overweight among Asians (Choo, 2002). Hence, the present study, BMI of all 620 women has been grouped into three categories. Nutritional status of women has also been measured in terms of frequency of consumption of milk, green vegetables, pulses and fruits. Their frequencies have been categorized as daily, weekly, occasionally and never.

Other than nutritional status, health status of women has been measured in preventive taken during childbirth. It is antenatal care taken during motherhood. Full antenatal care involves three or more antenatal visits, two tetanus toxid injections and iron folic acid tablets for at least 90 days. Those who received less than that were considered in partial antenatal care. Further during childbirth attendance of skilled or trained ANMs were considered as professional help. Women’s health has also been measured in terms of disease prevalence. For this disease prevalence rate of all age groups of women population was calculated using the following formula:

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\text{Disease prevalence rate (Females)} = \frac{\text{Females reported ill of any type}}{\text{Total female population}} \times 1000
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The association between various socio-economic variables and health and nutritional status of women has been measured using chi-square. The determinants of women’s nutrition have been extracted by Principal component method.

The study is organized into five chapters. The second chapter deals with the spatial pattern of women’s nutrition measured in terms of BMI and her dietary intake. The extents of socio-economic variable are also
highlighted. The third chapter presents the spatial pattern of women’s health in terms of preventive and curative care. Caste, educational and economic variations are also highlighted. The fourth chapter presents the evaluation of health and nutritional intervention programmes introduced in Haryana by center and state governments. An efficacy of the schemes in terms of its awareness and beneficiaries has been presented in this chapter. The fifth chapter deals with the determinants of women health and nutrition. Chapter six presents the summary of conclusions.