CHAPTER II

REVIEW OF LITERATURE
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A brief review of some recent studies from all over the world and in India on various aspects of aging is given below. The shift from communicable to non-communicable diseases is fast occurring in most of the developing world, where chronic illnesses such as heart disease, cancer, dementias and depression are quickly becoming the leading causes of death and disability. It is expected that this trend will escalate over the coming decades. In 1995, non-communicable diseases, mental health disorders and injuries caused 51 percent of the global burden of disease in developing and newly industrialized countries. By 2020 the burden of these diseases will rise to approximately 70 percent in them (WHO, 2001).

The NSSO survey (July 1995 - June 1996) studied the extent of utilization of facilities in the field of health and highlighted that the prevalence of chronic diseases among the aged was in general seen to be very high and it was higher in the urban areas (55 percent) than in the rural areas (52 percent). Problem of joints and cough happened to be the most severe diseases for the aged.

The urban - rural differences in the pattern of chronicity are well defined in Indian context. As per Census data on aging population of India (1991) based on Medical Certification of Causes of Deaths (MCCD) for the year 1990, it was observed that for the age group 65 - 69 about 37 to 38 percent of the deaths in urban areas occurred due to diseases of the circulatory system followed by 20 - 22 percent of them by symptoms, signs and ill - defined conditions whereas about 8 to 10 percent of the deaths occurred due to infectious and parasitic diseases. For the age group 70 years and above also these three cause groups of diseases were found to be the major causes of deaths. In rural areas about one-fourth of the deaths occurring of elderly population
were chiefly due to respiratory problems such as bronchitis and asthma, about 13 percent due to heart attack, about 6 percent were due to cancer, and 7 percent due to tuberculosis of lungs.

A study in rural north-eastern Indian state of Manipur registered eye problems in nearly 80 percent above the age of sixty (Devi and Bagga, 1997). As per World Bank (1994a) and International Institute for Population Science, (1995) considerably more numbers of women than men are affected by visual disability in India.

A study conducted by Bagga (1999) on 100 Maharashtrian urban middle-class elderly was aimed at highlighting the prevalence of some of the so-called "minor" health complaints. Since the elderly are not homogenous subpopulation with a uniform set of needs, the researcher planned to estimate the increase in kinds of disability from the 'young-old' (60-69 yrs) to old-old' (70-79 yrs) and the "really old" (80 years and above). The elderly's chief complaint was eye ailments. Nearly 57 percent suffered from one form of eye ailment or another, such as glaucoma, retinal disorders and watering. 45 percent suffered from cataract and a few had already been operated on, for either cataract or glaucoma. A significant increase in eye ailments was observed with advancing age.

Hearing impairment also showed an increase from the seventh decade to the eighth and ninth, so that more than half of those aged 80 years and above, suffered from partial deafness. Nearly 45 percent of aged complained of osteoarthritis and the frequency was almost consistent for older age groups. 15 percent of the aged reported at least one fracture after the age of 50 years, which was not due to an accident but occurred during routine work, mostly at home. Two subjects, each in their eighth and ninth decades, reported repeated fractures indicating a relatively advanced stage of
osteoporosis. Nearly half of the aged complained of some problem or the other related to the digestive system. Constipation ranked the highest, the older groups complaining of it more often. Nearly one-third of all elderly questioned reported flatulence or disturbance in the digestive system. The prevalence of urinary incontinence and hypertension increased gradually from the seventh to the ninth decade. Researcher concluded that the increase in disabilities due to vision and hearing impairment, osteoarthritis, urinary incontinence and hypertension highlights the differential health status of elderly, with the disadvantage of the older groups being greatest.

Dilip (1999) examined the prevalence of different kinds of disabilities and chronic conditions among elderly in the Kerela State. The burden of disabilities and chronic conditions were found to be higher in rural areas than in urban areas. But life-style and dietary related chronic ailments, such as blood pressure and diabetes were more prevalent in urban elderly. Prevalence of physical disabilities was much higher in females, whereas chronic ailments like cough, piles, heart disease; urinary problems and diabetes were more in males. More than 50 percent of the elderly were suffering from at least one form of chronic ailment. Joint problems were observed among a sizable proportion of elderly and the problem was more acute in females.

In another study, the prevalence of morbidity, hospitalization, disabilities and chronic conditions in elderly populations of Kerala, was examined by Dilip (2003). Majority of these non-fatal outcomes were more in "old-old" persons than "young-old" and in rural areas than in urban areas. Though morbidity and hospitalization rates were higher among males, the prevalence of physical disabilities and most of the chronic conditions were more in elderly females. It was also observed that diseases of affluence like diabetes, blood pressure and heart diseases and the level of morbidity
and hospitalization were more among rich than the poor aged. Similarly diseases of affluence and hospitalization were more in urban areas. Higher levels of morbidity, disabilities and chronic conditions were found in rural areas.

A study conducted by Shah (1993) on 482 elderly in Ahmedabad city of Gujarat reported that elderly in joint families suffered more, whether diseases or disabilities were considered. Another serious aspect of the health observed was that aged did not report their ailment and accepted it as a part of aging process. Even if they would report about their ailment to family members, reportedly they would not get satisfactory response. Consequently, more disabled people have started opting for institutional care now-a-days.

Bagga (1994) carried out an anthropological investigation on the elderly subjects living in three old ages for the elderly in Pune which included data on socio-cultural dimensions and health Status and anthropometric changes in the body with advancing age. Analysis of the health status of the elderly Maharashtrians revealed that their most common complaint was blood pressure variation (52.33%) followed by digestive disorders (44.2%) and arthritis (43.3%). A gradual increase was noticed in the frequency of blood pressure variation from sixth decade (35.29%) to seventh (44.74%), eight (60.00%) and ninth decade (66.66%) respectively. Total frequency of arthritis remained more or less constant with slight increase in older age groups. In the severe type of arthritis 13 subjects reported fractures with 5 experiencing repeated fractures. Onset of memory loss and dullness in demeanor was noticed almost simultaneously towards the end of seventh decade with a marked increase in subsequent years.
Non-insulin dependent diabetes mellitus (NIDDM) is one of the most serious diseases among certain ethnic groups (Kriska et al., 1993) first reported the incidence of NIDDM in Bengalis of Indian regions. Several authors reported association of various factors with NIDDM. These include increased body mass index, age, hypertension, male gender urban living and income (Zimmet et al., 1981). A decreased risk for NIDDM with increased physical activity was also observed (Kriska et al., 1993).

Kacker (1997) focusing on hearing impairment on the elderly summed up that aging affects all parts of the ear. The effect on the inner ear and its central connections was the most important cause of prebyacusis and contributes maximally to communication difficulties faced by the aged. A prevalence of 3.7 to 3.3 percent was found in general aged populations surveyed in rural and urban India respectively. Researcher expressed his concern for non-availability for rehabilitation and fitting of hearing aid as an organized facility in India especially to the common old person.

While incidences of hypertension, heart diseases and diabetes were found to be higher among urban Indian population, it was cough and problems of the joints that were more frequently reported from villages (NSSO. 1991; Rao and Townsend, 1998). Visual disability and other eye problems were among highest reported both by urban as well as rural elderly. Visual impairment as such is associated with aging and tends to be higher in older age groups (International Institute for Population Science, 1995; NSSO. 1991). Cataract is the most common eye problem leading to blindness and accounting for roughly 80 percent of such cases (World Bank, 1994a). Other eye problems such as glaucoma, retinal disorders, corneal opacity, etc. largely remain undetected and untreated. A small study conducted in Tamil Nadu, from south India reported visual disability affecting 89 percent of the elderly (Rao, 1992).
In a cross sectional observational study by Dey et al. (1999), 1586 elderly subjects (males 1035 and females 551) attending an outpatient facility of tertiary care hospital were subjected to assess the health, functional and nutritional status. Ninety five percent of the subjects were aged between 60 and 80 years. Eighty five percent reported with obesity. However, their intake of nutrient was deficient in quantity and quality as indicted by deficiency in total calorie, protein, fat, carbohydrate, vitamins, and mineral consumption. Evaluation of functional status revealed that 53 percent had visual deficit, 21 percent had hearing deficit, 38 percent had walking difficulty, and 44 percent had dental problems. Nineteen percent of the subjects admitted to the hospital having depression, which could only be substantiated in 8.5 percent of cases by the researchers.

A study (Bagga and Sakurkar, 2000) was undertaken to evaluate the general health status of middle class urban women aged 60 and above. Data comprised of 100 Maharashtra Brahman of Pune City. Among the major diseases, almost a quarter suffered from cardiovascular problems and an equally high frequency was observed for 'maturity onset -diabetes', four each had asthma and cancer. Increasing trend in the incidence of various so-called "minor" health complaints commonly associated with advancing age was observed. Eye ailments ranked highest (55 %) and half of them suffered from mild to acute arthritis. 55 percent from gastric disorders, 44 percent from urinary incontinence, and nearly one third had hearing problems of varying degree. Statistically significant increase in sensory impairments such as hearing and eye ailments, arthritis and urinary incontinence from 'young - old 'to old' was well demonstrated in them.
Another study carried out by Mao (2003) in Dharampur district of Himachal Pradesh examined the physiological (health) problems of the aged. Out of 132 households selected from four villages, 155 aged individuals (95 males and 60 females) were selected between the age range of 55-70 years and above. The most common physical complaints of the aged were hypertension, rheumatic pains and asthma. Minor ailments were indigestion, urinary trouble, and heart trouble. The most common disabilities were impaired eyesight and hardness of hearing.

Dayabati and Bagga (2006) examined the general prevailing health conditions among two groups of North-East India- Meetei, of Manipur and Assam having the same broad genetic make up but exposed to different environmental conditions. Data comprised of a total of 700 adults in the age range 20 to 80 + years. Information regarding the socio-demographic factors such as living arrangements, marital status, economic, education and general health of the older persons was collected using interview schedule. Results showed that more than half of the women were widows. Only 10-12 percent of women in both the groups had primary school education. The Meetei of Manipur belonged to lower income group. Agriculture is the main occupation and majority of them are daily laborers. Majority of the elderly reportedly suffered from more than one ailment at a given time. The most common complaint was arthritis followed by eye ailments, digestive disorders, hearing impairments, fractures, urinary incontinence, and NIDDM. In elderly of Assam, the most common complaints were digestive disorders followed by arthritis, eye ailments, urinary incontinence, hearing impairments and fractures. Increase in frequency from 'young-old' to "old-old" group was observed for arthritis, eye ailments, hearing impairments, fractures, urinary incontinence, digestive disorders, NIDDM and falling attacks in both groups. Complaints of musculo-skeletal system were higher for Manipur and
they reported more fractures, the frequency of which increased with advancing age. More women (50%) from Assam complained of mild, moderate and severe forms of urinary incontinence. Researcher concluded that Meetei of Manipur had more number and intensity of health complaints as compared to Meetei of Assam. Even though genetically similar, with better socio-economic conditions, regular income among the migrant Meetei of Assam, better medical facilities and improved health care due to closer proximity to urban area and better education of the migrated, had reflected upon the health of their families.

A study conducted by Batra (2004) in Delhi was aimed to identify the health problems of the elderly belonging to varying socio-economic backgrounds. The sample consisted of 150 men and 150 women belonging to two age groups less than 70 and more than 70 years. Age group-wise comparison showed that with increasing age the frequency of elderly suffering from nearly all the ailments of all systems (e.g. diseases of the digestive system, musculo skeletal system; serious ailments of skin and subcutaneous system; and diseases of sense organs) showed a hike in both the sexes. The significant variation in men and women was that nearly entire group of women suffered from diseases of musculo-skeletal system. It increased to 90 percent after they were 70 years old. The infectious diseases and the diseases of sense organs were also more prevalent in elderly with increase in age. The disease of circulatory system also showed a steep rise (49% to 75%). The diseases of nervous system did not increase. Nearly 50 percent of men and 42 percent women suffered from serious ailments (e.g. tumors or tuberculosis at terminal stage) after they reached 70 years of age. It was noted that nearly one-third of women and one-fifth of men developed cancer after 70 years of age.
Goswami and associates (2004) conducted a study to measure the self-rated health status of the rural aged 490 men and 497 women and selected indicators like living habits, psycho-social problems, body mass index. The study covered seven villages with a total population of 17,795 in Ballabgarh, district Faridabad, State of Haryana. Their self-rated health status was analyzed in relation to educational status, marital status, working status, economic status, economic dependency, and living arrangement. Results showed that two-thirds (66.6%) of the respondents perceived their health to be 'poor'. Significant difference was found between proportion of men and women perceiving their health status as poor (61.6% man verses 71.6% women, p <0.05). The possible reason for the reported gender difference might be the higher proportion of women being illiterate compared to men there. The study showed a significant relation between illiteracy and perceived poor health. More illiterates rated themselves as in poor health compared to literates. Women living alone assessed their health status "poor" more often than men. Statistically significant association between self-rated poor health and problems such as dependency, not satisfied with life, sleep problems, depression, disability and widowhood were observed. Chronic diseases reported were arthritis, hypertension, paralysis, diabetes, cancer, asthma/bronchitis, tuberculosis and cataract. Self rated health, behavioral factors; namely, dissatisfaction with life and depression also influenced perception of health status. As researchers expected, aged who had higher or lower body weight rated their health as poor.

Shrivastava and Verma (1999) assessed the socio-medical needs of the elderly in the present set up of Indian society and reported that the respondents discussed their health problems in detail without any hesitation. The frequently of reported ailments were joint pain, digestive disorders, blood pressure, asthma,
cardiovascular problems, kidney problems and sleeplessness. When asked about the care, protection and respect received in the family, 27 percent were sure of having no problem in this regard, while 34 percent hinted at problems in getting along smoothly with their family members. They expressed hope to get accustomed with the state of affairs, which was not so bad after all, they opined. Only 3 percent felt absolute dependency on others whereas 69 percent thought that they could do without others. When asked about preferred living arrangements, 71 percent preferred living with family members while rest of the 29 percent preferred living away from their children. Almost all expressed lack of social and medical support services.

Focusing on the health status of the "old - old", Halpert and Zimmerman (1986) questioned the universal applicability and utility of age groupings among the elderly and the predictions. Comprehensive health data from an elderly population in rural Minnesota showed the "old - old" to be comparable in some respects, better - off than the 'young - old". Drawing on the notions of compression of morbidity and survivorship, this study suggested looking beyond simple age distinctions in order to identify groups with increased risk.

The Western Sydney's Stroke Risk (Gliksman et al., 1995) in the elderly study examined the relationship between marital status, living arrangements, widowhood and extent of social support, and risk factors for cardiovascular disease in men and women aged 65 years and over. Results showed that unmarried men had the lowest mean HDL-C levels. Men living alone had the highest mean systolic blood pressures. The lower mean HDLC levels and higher DBP levels seen among widows were not statistically significant after adjustment for differences in past medical history and education levels. The extent of social support was not associated with any significant
differences in cardiovascular risk factor levels among men or women. Researchers concluded that some of the increased risk of cardiovascular disease associated with socio-demographic factors in this age group might be due to differences in primary cardiovascular disease risk factors.

Rajkumar (1995) expressed that aging is not synonymous with disease but it increase the vulnerability of an individual to develop certain physical and mental illness. Of this the commonest were dementia, depression, arthritis and cardiovascular problems.

The National Sample Survey (1986 - 87) of the elderly found loneliness to be one of the major problems of the aged in India. More of the Indian elderly were without their spouse and lived with children or grandchildren in their old ages. While examining the perception of the aged themselves on their status in the family and community in the wake of changing social structure, it was found that the aged felt to have lost their status due to old age and also due to their retirement from work. Such feeling was different between genders as majority of the females never had the feeling of having retired from work as against the males whose 'status feeling' seemed to be associated with their work status.

The status of the aged in the changing social structure, have been investigated by social scientists from different perspectives. Such investigations have more or less concluded on the breaking down of kinship and family organizations, which has put the elderly in a state of helplessness, isolation and economic dependence (Dak and Sharma, 1987).
A study by Kaur and associates (1987) emphasized the fact that the present
generation treated the old as a burden. In the Indian family system traditionally
parents are taken care off by their children. But, the burgeoning of the nuclear family
and separation of the off-springs from the parents create a situation where the old
parents have to stay on their own. On some occasions, the children provide the
economic security but the emotional requirements of the elderly are not met with. In
this context, most of the primary surveys have investigated on the preference of the
aged regarding their place of stay and it was reported that a majority preferred to stay
with their or their own family members in their old age (Nandal et al., 1987).

The measurement of mental and emotional functioning is important, especially
in the study of the elderly, because mental and physical functioning are often
interdependent states. A number of studies call for the assessment of mental health
status when considering functional status and physical health (Ware, et al., 1981;
Craig and Natta, 1983).

The National Sample Survey Organization (NSSO) in its 52nd round (July
1995 - June 1996) and published in 1998, carried out a nation wide survey on social
consumption to assess, among other things, the nature and dimensions of the socio-
economic problems faced by the aged, persons of age 60 years and above. NSSO
survey report highlighted that the aged formed about 5.5 percent of the total
population of India. The share of the aged, in general, was higher among females than
males and was also higher in rural areas than in urban areas. The old - age
dependency ratio was higher in rural than in urban areas. The sex ratio (viz. the
number of females per 1000 males) among the aged was 983 during the earlier survey
(1987 - 88) to (1993 - 94) a recent survey, which rose to 1023 in 1995 - 1996. The
proportions of widows and widowers (58 to 61 percent) was pronounced among the
aged, but declined over time. The decline was sharper among females in urban areas.
About 94 percent of aged persons had at least one surviving child and 6 percent either never had any child or had children who were not surviving on the date of survey. Only 33 (rural) to 35 (urban) percent of the aged were living without spouse but with their children, 5 percent were living with other relations and non-relations and 4 to 5 percent lived alone. As many as 70 percent of the aged had to depend on others for their day-to-day maintenance. The situation was still worse for elderly females. Among them, about 85 to 87 percent were economically dependent, either partially or fully. Of the economically dependent aged, 74 percent were dependent on their children and 14 to 16 on their spouses, for their economic support. On an average an aged male had more dependents than an aged female during 1995–96. Nearly 40 percent of the elderly in India were working to earn their livelihood. Among the aged who were once employed either as wage/salaried employees or as casual labor, about 7 percent in the rural areas and 35 percent in the urban areas did not receive any benefit on their retirement. About 54 percent of the aged had some kind or other form of financial assets in 1995–96. The proportion was 8 percent points lower in 1986–87. In the rural areas 63 percent of the aged owned some property. The corresponding estimate was 58 percent for the urban areas.

Review of studies on certain socio-demographic factors such as marital status, living arrangements, reduced or no income, issuelessness and or death of children, etc. possibly influencing the health condition in old age have been given below.

Marital Status

The greater longevity of married as compared with unmarried persons has been repeatedly demonstrated by studies dating back to the mid-1800s. It is now well known that health status and health utilization as well as mortality, differ systematically by marital status for both sexes (Hu and Goldman, 1990). In almost all investigations in the U.S. and in other industrialized countries, married persons enjoy
better health, make fewer demands on the health care system and experience lower
death rates than single, widowed and divorced persons (Hu and Goldman, 1990).
Researchers have demonstrated that mortality differentials by marital status are
widespread (Hu and Goldman, 1990). In particular, married men as well as married
women possess a longevity advantage relative to their unmarried counterparts in
every country (and time period) that has been investigated. In addition, the married
experience lower mortality than single or formerly married individuals within each
adult age group. At the same time, investigators have shown that these differentials
vary both by gender and by age. The longevity advantage of married is almost always
greater among men than among women (Hu and Goldman, 1990).

Widowhood

Widowhood is considered a curse in the Indian culture and widowhood in old
age adds to woes of aging. A study of widows on their self- concept, was carried out
on a sample of 90 widows and 90 non - widows in the age groups of 50 - 59, 60 - 69,
70 - 79 by Jamuna and Reddy (1993). Self- concept, measured through a 30 item self-
concept inventory, showed that widows had a considerably more negative self-
concept than non - widows. The effect of widowhood was maximum in the first year
of widowhood than in the later years. Elderly widows are identical as a special
concern group in view of their increasing numbers and dependency and also because
they are doubly marginalized due to the combined effects of aging and widowhood.

Prakash, (2000) explored the major concerns of adult women as they move
into old age. Findings from several studies were combined in this study to highlight
the issues during mid - life and old age. Researcher pointed out that education, health,
marital status, rural or urban - residence and economic status influence well - being of
older people.
Aged and family

Rajan and associates (1999) have expressed well the way the traditional Indian family structure would provide the required environment for comfortable living of the elderly. The extended family usually consisting of two generations living together, the elderly used to have a different status in the household. But with a rising number of nuclear families, the elderly seem to have been deprived of certain needs, which are not adaptable to them. For instance, the developmental evolution has taken the female folk out of home and transformed the family structure to be nuclear which results in deprivation of care for the needy at home. In these circumstances, another dimension of the elderly, which attracted attention of researchers, is the living arrangements among the elderly. Usually the living arrangement is understood in terms of the family type in which the elderly live, the headship of households elderly enjoy, the place where they stay and the people with whom they stay, the kind of relationships they keep with their kith and kin and on the whole, the extent to which they adjust to the changing environment.

Living arrangements

Various survey findings in this direction conclude on the deteriorating status of the elderly in the transient Indian family structure. In this regard, D' Souza (1989) observes that change in living arrangements, family structure and mode of sudden retirement adversely affect the old, and further, that the old people are, in increasing proportion, losing the status and security which they enjoyed in the traditional Indian family structure.

With regard to the transformation in Indian family system, Dreza (1990) views a considerable overlap between the problems of widows and old age in rural India, i.e. for an economically independent couple the decision on co-residence with the
children (son in particular) is based on the situations and preferences of the older as well as the younger generations. Also there seems to be a differential situation between the elderly with or without surviving offspring, no matter whether the elderly live with the surviving offspring or not. In addition, the currently married status reduces the probability of the elderly's co-residence with children and having more children increases chances of co-residence (Martin, 1992; Rajan et al., 1999).

Srivastava and Agrawal made an attempt (2002) to study the effect of living arrangement and gender differences, on emotional well being of old people. 120 people aged 65 years and above (60 aged numbers living with their children and 60 living in ashrams) were interviewed. The results indicated that emotional state like anxiety; depression and guilt were more in old people living in ashram who were interviewed. Old women suffered more from stress, depression, and guilt feelings.

Low income, regardless of age, is known to be strongly related to health problems. In the mid-1970s about three times as many poor as non-poor had their activities limited by chronic disease. Since poverty is widespread problem among the elderly, their health problems are compounded by it. Poverty affects every aspect of life, including nutrition and good health is difficult to maintain without adequate nutrition.

Often, old age is accompanied by increased incidence of chronic disease and higher poverty rate as well as the problem of neglect, loneliness, inadequate medical care and lack of friends, which is well documented (Wilson, 1970).

Binstock and Shanas (1976) feel that in general, the lower the socio-economic position of an individual, the higher the age specific death rate. This is particularly so for those aged sixty and above as they are subject to the health
liabilities of being old. Reddy (1997) in his study of rural areas of Tirupati found that elderly with low economic status had poorer attitude towards their own health. Because of poverty, people put up with poor health and compromised on health practices. They could not afford to give good attention to their own health and hence poor health attitudes.

Vermani and Darshan (1999) made an attempt to delineate the factors affecting the health of older people and concluded that the major factors affecting the health of older people were of social, economic, psychological and demographic nature. They felt that health status of older people was affected by type of family, family status, attitude of family members towards aged, attitude of aged towards life, educational level, marital status, gender, economic status, place of living, dietary pattern and psychological well being.

**Anthropometry as an indicator of health status**

The human body does not remain static and changes take place even after the completion of growth. Many forces, environmental and genetic, combine over time to produce changes in its form, its capabilities, and in its effectiveness (Bagga UGC Major Research Project 1996-2000). Aging is one of the challenging areas of study as the process of aging, as it is so highly variable individually. Even in the same person, all organs and system do not age at the same rate. Difficulties also lie in measuring and evaluating the age effects. Biological anthropologists Borkan and associates (1982) define aging as "Aging is the sum of changes which occur primarily in the post reproductive period, which are characteristic of an individual in a population, and which as a whole decrease the functional capacities of the organism, and render death increasingly probable. This working definition emphasizes biological aspects of aging, which have also been referred to as senescence. Even though aging makes
death increasingly probable through the progressive debilitation of functional capacity, yet aging is never given as a cause of death on death certificates (Borkan, 1982).

Anthropometric characteristics of individuals and populations are simple and strong predictors of future ill health, functional impairment, and mortality: in turn, they may be modified by disease. For these reasons, anthropometric data are used in many contexts to screen for or monitor disease.

Aging is viewed primarily at the level of post-reproductive adult individual, although senescence occurs even in cells of the embryo. Crews and Mackeen (1982) attempted to study aging in genetically similar populations exposed separately to differing social and physical environments. They contrasted causes of mortality in traditional and modernizing areas of Samoa and found the high degree of obesity and mortality was due to diabetes mellitus and cardiovascular diseases among males to be more closely linked with western lifestyles and sedentary occupations, following recent westernization.

Similarly, Pawson and Janes (1982) who investigated some physical related variables weight, height, blood pressure, fasting glucose levels, mortality records in Samoans living in California, found that changes were more pronounced in individuals living under more urbanized conditions.

Finau et al. (1982) studied effects of stress and life changes among the different Polynesian populations following their migration to New Zealand. They reported that patterns of blood pressure, body weight, serum lipids and clinical disorders in the elderly were greatly varied, and related most closely to the adoption of a Westernised life style and urban environment.
Borkan and Norris (1980) applied a profile of 24 age related physical parameters to assess biological age and found an association between physical activity and aging. Active men in general were biologically found to be younger than inactive men, even when physical health, weight and educational attainments were held constant.

Borkan et al. (1982), found the chances of survival, similarly estimated from rates of biological aging, to be influenced by certain lifestyle variables like smoking behavior, poor physical health and obesity.

There have been a number of cross-sectional analyses of changes in body size, physique and composition with age particularly in Western countries. Age changes in dimensions of stature measurements; weight; various body girths and body composition, and physiological responses have been noted by Eiben and Thoma, (1960); Miall et al. (1967); Dequeker et al. (1969); Harvey, (1974); Rossman, (1977); Parizkova and Hiselt, (1980); Roche (1979); Beall, (1982); Malina et al. (1982); Borkan et al. (1983); Galloway et al. (1990); Shephard, (1991); Kirchengast, (1994): WHO, 1995; Ulijaszek et al. (1998).

In India such studies have been conducted by Sharma (1998); Sidhu and associates, (1975); Singh, (1978); Banerjee and Sen, (1984): Bagga, (1998); Kapoor, (2000); Venkatramana et al. (2001): Tungdim et al. (2002) and Reddy et al. (2004).

Data from various elderly populations (60+ yrs) throughout the world have been compared to examine the distribution of anthropometric parameters. Analysis of height - for - age in 19 studies with adequate population data revealed wide geographical and ethnic differences. Study further pointed out that height decreased with age in all populations: 1.9 to 6.7 cm in men and from 2.0 to 6.0 cm in women. In most populations BMI is greater in women than in men (WHO, 1995).
Clement (1974) evaluated, both cross-sectional and longitudinal, the decline with age in basic hand grip measurements in men and women from various socio-economic levels. Greater physical or intellectual activity was found to have favorable effect on the maintenance of physical strength with age. Beall and Goldstein (1982) found contrasting aging experience of Sherpas in Nepal with those of western populations. They felt that living in extended family structures did not prevent the elderly from having to face aging problems.

A longitudinal study of 70 year olds in Gothenburg, Sweden (Svanborg et al., 1991) focused on serial changes in height, weight, and BMI for the age interval 70 to 82 years. It concluded that change might vary from population to population depending upon various environmental and genetic factors (WHO, 1995).

Weight changes during aging represent a complex phenomenon, involving simultaneous changes in several tissues and a redistribution of subcutaneous fat. Skerlj et al. (1953) in their study reported that the trends shown indicated a slight tendency towards an increase in the contribution of subcutaneous adipose tissue to total body weight with age in women. While the total body fat, as estimated from specific gravity, indicated a continued rise with age, the subcutaneous fat and total body weight did not increase from the middle to the oldest group. Researcher concluded that the fattening of the female body during the later phase of maturity goes on principally by increase in the inner fat. Further more, since the total weight of the body was not changing, this accumulation of inner fat seemed to be occurring at the expense of other tissues in the body. They felt that the deposition of internal fat could be an important component in the complex phenomenon of aging.
A study of 95 men and 431 women over 85 years of age in Finland showed that low BMI was a more important predictor of risk of death (Mattila et al., 1986). Highest 5 years mortality was reported in the group with BMI <20.0 and the lowest in the group with BMI > 30.0. It was concluded that overweight ceases to be a risk factor for death in this age group.

Numerous studies suggest that measuring the distribution of fat is as important as measuring the amount of fat (Larsson et al., 1984; Ducimetiere et al., 1989; Folsom et al., 1989a). Because of recent associations of body fat with the chronic diseases of well-fed societies, age-related trends in fatness over the life span are being thoroughly investigated from time to time (Roche 1979; Kapoor et al., 1980; WHO, 1995).

Some researchers (Garn et al., 1988; Shephard, 1991) feel that the pattern of regional fat distribution seems relatively stable within a given person over periods as long as five years, but is influenced by age, sex, nutritional status, habitual activity patterns and ethnic background.

Hussain (1996) assessed the physical changes taking place with age in various body dimensions of Indian Maratha Kunbi residing in both urban and rural areas of Pune district in Maharashtra. The aim was to assess physical changes taking place with age in various body dimensions. Since the greatest differences in rates of aging are related to community life, the study examined aging in people of the same broad genetic make up but exposed to dissimilar environmental backgrounds. The sample consisted of 756 adult rural Kunbi \((N = 371)\) as well as urban \((N = 385)\), their age ranging from 23 to 80 years. A group of anthropometric measurements reflecting or believed to vary with age were taken. The data were grouped into six successive age groups with an interval of ten years each. It was found that, mean values of height
vertex, sitting height and arm span decreased with age in the subjects examined. Body weight, limb circumferences and skinfold thicknesses in rural elderly showed no change up to 60 years after which they declined.

Urban elderly showed a trend of relative increased (though minimal) up to sixth decade followed by a decline like reported by researchers from developed countries. Another study (Bagga. 1998) showed that lifestyle played an important role in shaping the individuals into old age. The study focused on pattern of anthropometric age changes in the Indian migrant Punjabi and Sindhi and comparison made with local Maharashtrian having an entirely different genetic make up and lifestyle. Total decline in height in six decades in the local Maharashtrian was about two and half times of the migrants, and overweight status of the migrants in their corresponding control group and in the subsequent decades, was maintained in all age sets. Inspite of first increase and subsequent decrease pattern in both the groups studied, the decrease was much slower in the migrants Sindhi and Punjabis. It was true for four girths and two skinfold thicknesses studied. Weight increases and general obesity among the middle class Punjabi and Sindhis appeared to be due to a habitual excessive food intake, consumption of rich fried and frequent non - vegetarian food, compounded by a sedentary life style. On the other hand, lesser consumption of calcium rich food such as milk and milk products by the local Maharashtrian Bramhin could possibly be responsible for a rapid reduction in bone mass indicated by a sharp decrease in linear measurements such as stature and sitting height, the researcher concluded.

Atre (1999) studied anthropometric age changes among Maratha males. Data comprised of 200 males, 100 each from urban area of Pune and Sangli districts, in
Maharashtra state and from some rural villages of Saswad Taluka near Pune. Subjects were selected in the age ranges of 40 years to 80 years and above. Parameters such as height, weight and some girths; blood pressure and muscle strength were examined. Results showed that the cross-sectional decline in height in rural Maratha was almost three times as compared to that of urban males. All fat related measurements (weight and body girths) showed declines with age in rural as well as in urban males, the loss being more pronounced in the rural group.

Selected anthropometric and physiological parameters were examined on the cross-sectional sample of total 126 healthy Rajput adult males between the ages of 40-49 years and 20-25 years as control groups of Rajgarh tahsil of Himachal Pradesh by Tungdim and associates (2002). Most of the anthropometric and physiological measurements like bi-cristal breadth, waist circumference, hip circumference, systolic blood pressure, diastolic blood pressure, pulse rate, and heart rate were observed to increase gradually with advancing age. But a few variables such as stature, sitting height, calf circumference and grip strength showed a general decline with aging. The measurements like body weight, bi-acromial breadth, bicep skinfold thickness and tricep skinfold thickness showed a general increase up to middle age followed by a significant decline.

Gensini et al. (1996) reviewed the menopause and the risk of cardiovascular disease included a brief discussion of blood pressure and concluded that, although blood pressure rises considerably in women after menopause and cardiovascular morbidity approaches levels observed in men. Few studies support the view that the hormonal changes associated with menopause directly mediate blood pressure. Effect of menopause on blood pressure and cardiovascular disease may be more directly a result of changes in other cardiovascular risk factors, including weight gain and lipid levels.
A comparative investigation of 99 normotensive and 111 hypertensive Bengalee Hindu elderly men aged 55 years and above of Kalighat, South Culcutta, India, was undertaken to study the differences in the levels of adiposity, body fat distribution and body composition between these two groups (Ghosh, 1999). Results revealed that there were significant differences between normotensive and hypertensive subjects in the mean values for weight (P<0.05), body mass index (BMI < 0.05); waist (p<0.001) and hip circumferences (PO.05); and waist hip ratio (WHR; PO.001) and conicity index (CT: P< 0.01). Percentile distribution for all these variables and indices showed consistently higher values among the hypertensive patients as compared with normotensive subjects. Thus, these results indicated that there existed significant differences in central adiposity between normotensive and hypertensive subjects. Hypertensive individuals had significant enhanced levels of central body fat distribution (Ghosh, 1999).

In contrast to fatness, not too much is known about the aging of the bodily distribution of fat. In two individuals of similar body weight, sum of skin-fold thickness or percent body fat, can have a very different anatomical distribution of subcutaneous fat. It is now apparent that most individual differences in bodily distribution of fat center on the relative contrast of extremity and trunk fat (Muller and Wohlleb, 1981).

Above review demonstrates that

1. The processes of aging are neither fixed nor immutable. They are the product of a complex interplay among social, behavioural, and biological processes.
2. Aging processes are influenced by and influence of changing cultural, socio-economic, and population structures, which vary over historical time. Aging processes occur over the entire life course.

Since Indian family system is in the phase of transition due to urbanization, industrialization, modernization, migration, and growing individualism, all must be contributing additively to give rise to a complex situation for the elderly, some of which were not common earlier. As increased longevity of a common man is a recent phenomenon in India, and the full impact of aging will be felt in the coming decades, there is a need to study the health of our old. It is equally important to isolate the factors influencing the health of elderly, whether physical or socio-demographic, which is one of the major goals of gerontological research.

Current health systems, both public and private, are geared more to serving children, adults, and specifically women in reproductive phase. Till recent past there were no such provisions or programmes for catering to the needs of our elderly. A few recent surveys such as NSSO (1991, 1996) give us only a peep into the health of our elderly conveying an important message that these need to be addressed urgently. Before the appropriate strategies aimed at targeting the health, we urgently need data on the existing health conditions of our elderly and their specific health needs. Further it is to mention that so far what ever the studies conducted limited to caste and general populations only, no study attempted to address the issues in tribal population groups, whose percentage of elderly may likely to increase. Hence there is a need to document the data in tribal population groups also. In these lines the present study is a unique one in its nature. The researcher faced hardship due to lack of literature for comparison with contemporary population groups. Hence, the results of the present
study are compared with existing literature available on other population groups only.

A brief ethnographic profile of the Sugali and the Yanadi tribes are given below.

**The Sugali's**

The Sugali's are a scheduled tribe inhabiting throughout of Andhra Pradesh. They are also known as Lambadas. Their population according to 2001 census is 20,77,947 constituting 41.1 percent of the state's ST population. The total literacy rate among Sugali's is 34.3 percent. The Sugali's are the largest tribe in Andhra Pradesh. Sugali's live in exclusive settlements of their own called Tandas, usually away from the main village, tenaciously maintaining their cultural and ethnic identity.

The traditional dress of the men comprises of dhoti, upper garment and bright colored turbans. The womenfolk wear 'langa' of coarse cotton prints, richly embroidered with several fold at the waists. Sugali’s tribe is divided into five phratries viz., Bhukya (Rathod), Vadthiya (Jadhav), Chowhan, Pamar and Banoth (Ade). These phratries are further divided into a number of patrilineal kin groups called Pada or Jath (Clan) in their dialect.

Each phratry is an exogamous unit, and one has to marry outside his phratry. Clan is a patrilineal kin group. The girl loses the name of the clan of her parents as soon as she marries and acquires the clan of her husband. Traditionally joint family was playing a dominant role in choosing the mates, determining the residence, controlling the property, watching the morals and managing the affairs of the youngsters. The joint family was the norm in the early days among Sugali's, but now it is breaking down gradually into nuclear families. Marriage by negotiations is the only accepted way of performing marriages and sometimes marriage by service is also
practiced. The married women wear ivory bangles or imitation of them above their elbows, which are referred as 'Balia'.

There are traditional musicians and bards to Sugali's called 'Dappans' depend mainly on the gift presented by Sugali's on various occasions and also work as manual laborers. There are three divisions among Dappans viz: 1. Bhat, 2. Dhandi, 3. Dhalia. Bhats and Dhandis sing songs on family history by playing musical instruments called "Jange" and "Kinjri" during marriage ceremonies. Dhalia or Dapdiya plays dappu. There are traditional barbers to Sugali's called 'Navi'. There is another endogamous sub-division called Sonar Sugali's who manufacture silver and gold ornaments. All these groups are endogamous sub-division of main Sugali's Tribe. These groups also adopted the Clan organization of main Sugali's Community. But inter-group marriages are strictly prohibited. All these sub-divisions are considered inferior in social status to main group.

The Sugali's believe that the world is protected by a multitude of spirits-benign and malign. Hence the malignant spirits are periodically appeased through sacrifice and supplication. The Sugali's worship and pay reverence to the benevolent Gods such as Vishnu, Rama, Venkateswara and Seva Bhaya. Meraima is believed to protect their females and children and preserve the fertility of their lands and females while Seva Bhaya and seetala are regarded as the protectors of the cattle. They also celebrate the Hindu festivals like Ugadi, Balaji, Raki, Naga Panchami, Dasara, Deepavali, Sankranthi, Sivaratri and Holi. The important traditional festivals are Teej, Seetala and Tulja Bhavani and they regularly celebrate them. The dead are cremated in separate cremation grounds.
Sugali's have their own traditional council for each Tanda for the disposal of disputes originating from economic and social causes. This council consists of one headman (Nayak), one advisor (Karbari) and one messenger (Dappan). All the offices of the council are hereditary. They call traditional council as 'Naiker Ghar'. Sugali's are expert cattle breeders and largely subsist by sale of milk and milk products. They have settled in modern times on land and also became good agriculturists. Sugali's are giving up their nomadic habits and permanently settling on land. The landless families are migrating to towns and cities and eking out their livelihood by driving auto rickshaws and by rickshaw pulling. They are also engaged as laborers on daily wages in construction work of buildings, roads etc.

The Yanadi's

Yanadi's are one of the major scheduled tribes of Andhra Pradesh. Thurston (1909) noted that the people were natives of Sriharikota Island and suggested that they derived their name from the Sanskrit word "Anadi" denoting those whose origin is unknown. Now they are predominantly spread over the districts of Nellore, Chittoor, Prakasam and Kadapa. Yanadi's live in symbiosis with non-tribals.

Their population according to 2001 census is 4,62,167 constituting 9.2 percent of the state's Scheduled Tribe population. The total literacy rate among Yanadi as per 2001 Census is 35.3 percent. Their mother tongue is Telugu. Yanadi's are broadly divided into four endogamous groups on the basis of occupations and dietary habits. The sub divisions are: Manchi Yanadi's or Reddi Yanadi's (Cultivators and servants), Adivi Yanadi's (those living in forests) Paki Yanadi's (Scavengers) and Challa Yanadi's (those who collect left out food from leaf plates in the dust bins). The challa Yanadi's and Paki Yanadi's are considered to be unclean and low among Yanadi's.
Each division of the Yanadi is further divided into a number of patrilineal exogamous groups representing their lineage names (intiperlu).

Marriage by negotiations, by mutual love and elopement are usual modes of acquiring mates. The re-marriage of divorcees, widows and widowers is permitted. The nuclear type of family is more predominant. They propitiate some village deities like Poleramma, Chenchamma, Mahalakshmamma etc. In addition to these, they worship Hindu Gods and Goddesses like Venkateswara, Vinayaka and Rama. They celebrate Hindu festivals such as Sankranthi, Ugadi, Dasara etc..

Each Yanadi habitat invariably consists of traditional village council (Kula Panchayat) for settling the disputes crop up among the Yanadi’s due to adultery, theft, land disputes etc. The hold of traditional council is still stronger. Generally, the culprits are admonished by way of imposing simple fines followed by feast.

Yanadi’s are non-vegetarians and eat the meat of rabbit, fowl, goat, sheep fish etc, but abstain from eating beef. Yanadi’s mainly subsist on agricultural labour. They are traditionally inland fishermen and are also engaged as watchmen to the fields and orchards of farmers. Collection of firewood, rickshaw pulling, rodents catching etc., constitutes secondary occupation of the Yanadi’s.

With a view to settle these poverty-stricken Yanadi’s, land colonization schemes were started during the British period and continued after the post-independence period for the rehabilitation of Yanadi’s. The State Government has also introduced land assignment schemes to provide land for cultivation to the landless Yanadi’s. Besides, the development schemes under the sectors like education, housing, women and child development, medical, health and nutrition, roads etc are also under implementation for the benefit of the Yanadi’s.