CHAPTER - 2

REVIEW OF LITERATURE

2.1 INTRODUCTORY STATEMENT

Menopause is one of the crucial stages in women’s life which leads to various Physiological changes. Menopause is the physiological cessation of mensus associated with the failing ovarian functions, may be diagnosed in retrospect when a year has passed with no mensus. Symptoms of menopause may be alleviated or decreased by altering their nutritional status, which is one of the important environmental factors to lead a healthy life during menopause. Menopause women may experience increase in body fat mass and redistribution of fat mass from the limbs to a more central or android location. These changes can increase the risk of diabetes and cardiovascular diseases.

Nutritional status pertaining to pre, peri and post menopausal women is not available as such. The common menopausal age in Indian women is between 40-55 years. Therefore, the literature pertaining to this age group has been reviewed in this section which includes Stress, Nutritional Status (anthropometry, food pattern, nutrient intake and mineral status) Health Status (lipid profile, health problems and menopausal symptoms) and Life style Pattern (physical activity, meal pattern and exercise).

2.2 REVIEW RELATED FOR STRESS

The cross section study was conducted between May 1st & June 30th, 2009 by Unsal A. et al., (2011) on 744 postmenopausal women aged 45-65 years residing within Sivrihisar, Eskisehir, and a town in western Turkey. Depression was measured with a Turkish version of the Beck Depression Inventory and data were gathered by measuring their heights and weights. Statistical analysis used the $\chi^2$ (2) test and the Wald backward stepwise methods.
A value of p<0.05 was considered statistically significant and the prevalence of depression was 24.7% (184/744). The average age of the women at menopause was 46 years. Significantly important risk factors for depression were primary school education level (odds ratio (OR) 1681), not being married (OR 1.653), having a history of psychiatric illness (OR 2.186), entering into menopause at the age of ≤ 39 years (OR 2.705), having irregular menstruation before menopause (OR 1.729), and having no children (OR 3.316) among postmenopausal women is an important public health problem that requires Depression attention, furthermore, women are at risk in terms of depression after entering into menopause.

**Campbell T. P. et al., (2010)** conducted a study to examine the effect of a yearlong exercise invention of F2-isoprostane, and a general marker of oxidative stress. 173 overweight or obese, postmenopausal, sedentary women were randomized, either to an aerobic exercise intervention (60%-75% observed maximal HR) for > 45 mind d-1, 5d.wk-1 (n = 87) or to a stretching control group (n=86), on an intent-to-treat basis. Baseline and 12-month measures included urinary F2-isoprostane, maximal O2 uptake, body weight, body fat percentage, waist circumference, and intra-abdominal fat surface area. Urine samples were available from 172 and 168 women , During the 12-month study, controls minimally changed maximal O2 uptake (+0.2%) and body weight (+0.1 kg), whereas exercisers increased maximal O2 uptake (+13.6%, p < 0.0001 vs. controls) and decreased body weight (-1.3 kg; P = 0.007 vs. controls), F2-isoprostane decreased linearly with gain in maximal O2 uptake (P trend= 0.0005) relative to controls; exercisers who increased maximal O2 uptake by > 15% decreased F2-isoprostane by 14.1% (P=0.005 vs. controls). A borderline statically significant trend was observed between decreased waist circumference and F2-isoprostane (P = 0.06).
**Kotsiopoulos J. et al., (2010)** Evaluated the reproducibility, using infraclass correlation coefficients (ICC), of 77 plasma and 9 urinary biomarkers over 1 to 3 years among premenopausal (n=40) and postmenopausal (n=35-70) participants from the Nurses, Health Study and Nurses’ Health Study II. Plasma and urinary stress hormones and melatonin were measured among premenopausal women, whereas melatonin and the remaining biomarkers were measured in postmenopausal women. ICCs were good to excellent for plasma carotenoids (0.73-0.88), vitamin D analyts (0.56-0.72), bioactive somatolactogens (0.62), soluble leptin receptor (0.82), resistin (0.74), and postmenopausal melatonin (0.63). Reproducibility was lower for some of the plasma fatty acids (0.38-0.72) matrix metalloproteinase’s (0.07-0.09) and premenopausal melatonin (0.44). The ICCs for plasma and urinary phytoestrogens were poor (<0.09) except for enterolactone (plasma, 0.44, urinary, 0.52). ICCs for the stress hormones among premenopausal women ranged from 0 (plasma cortisol) to 0.45 (urinary dopamine). Results indicate that majority of these markers, a single measurement can reliably estimate average levels over a 1 to 3 years period in epidemiologic studies. Analysts with poor ICCs should only be used in settings with multiple samples per subject or in populations in which ICCs are higher.

**Ruby Yu. et al., (2010)** studied 509 post menopausal women, 50 to 64 years, from China. The interview included the PSS, the center of the Epidemiological study of Depression Scale (CES - D), the state trait Anxiety inventory (STAI), the menopausal symptoms checklist and questions on socio demographic characteristics and health behaviors, principle analysis was used to determine the component structure of the PSS items. Principle component analysis of the PSS showed that the scale consisted of 2 factors, which explained 52% of variance. Internal consistence was adequate (Cranach’s a = .81) and the test retest reliability after an interval of 2 weeks was 0.86 the PSS distinguished
well, and in the expected manner, between subgroups on the basis of age, work status, and marital status providing evidence of construct validity the PSS was also correlated with CES - D STAI, menopausal symptoms, and health behaviors, hence the construct validity was further supported the PSS appears to be a psychometrically sound instrument for measuring psychological perceived stress for Chinese women in mid life.

Vincent P. et al., (2009) conducted a study on important role for oxidative stress in the pathogenesis and progression of hypertension in women via a decrease of NO production after menopause. Regular physical training has been shown to up regulate antioxidant enzymatic systems, which may slow down the usual increase of oxidative stress in postmenopausal women. The aim of this study were to determine the impact of fitness status on enzymatic antioxidant efficiency, oxidative stress, and NO production and to determine the associations among oxidative stress, enzymatic antioxidant and NO production, mean arterial blood pressure (MABP), and cerebrovascular conductance (CVC) in postmenopausal women (n=40; 50 to 90 years old). Physical fitness, physical activity, resting MABP, and CVC were measured. It identified significant negative associations between oxidative stress and indices of physical fitness (malondialdehyde : r = -0.33, P<0.05; 8-iso-prostaglandin F2α : r = -0.39, P<0.05; 8-hydroxy-2'-deoxyguanosine : r = -0.35, P < 0.05) and physical activity (malondialdehyde : r = -0.30, P<0.05 ; 8-iso-prostaglandin F2α : r = -0.41, P<0.01 ; 8-hydroxy-2'-deoxyguanosine : r = 0.39, P<0.005). These findings demonstrate that, after menopause, fitness level and regular physical activity mediate against oxidative stress by maintaining antioxidant enzyme efficiency. Furthermore, these results suggest that oxidative stress and NO production modulate MABP and CVC.
Valentina V. et al., (2009) investigated the dynamic of weight gain and the activity of the HPA axis in women who developed weight gain after stressful event. This is a case control retrospective study in which two groups of age-matched premenopausal women One (n=14) included women characterized by a rapid weight gain following a stressful event, defined as the "stress-related obesity" (SRO) group, and the other (n=21) women with non-stress related development of obesity were selected. These findings support the concept that SRO has distinct path physiological mechanisms, including hyperactivity of the HPA axis.

Singh M. and Singh G. et al., (2008) aimed the work to compare the mental health status of middle aged (45-55yrs) working women who were under menopause period with those in post–menopause period. The number of subjects selected for study was 50. An interview schedule with General Health Questionnaire & psychosocial stress scale was simultaneously administered to the selected subjects. The observed mean scores of post-menopausal group were comparatively higher than those for during menopausal group however, the study resulted not statistically significant difference between the groups on various scores.

The present review by Wolf T.O. and Kudielka B.M. (2008) starts with the description of age-associated changes of the hypothalamic-pituitary-adrenal axis. In this context, the possible modulators role of estradiol is discussed. Later, the influence of rising stress hormone levels for the ageing brain is illustrated and a few intervention strategies are outlined. At the end, the concept of all static load (AL) is described, which aims at a broader assessment of the impact of stress on the individual. The strengths and also the current limitations of the AL concept are highlighted.
Yu L. and Chang A. et al., (2008) conducted a study on Accumulation of misfolded protein in the endoplasmic reticulum (ER) causes stress. The unfolded protein response (UPR) a transcriptional induction pathway is activated to relieve ER stress. All though UPR is not essential for viability, UPR deficient cells are more sensitive to ER stress; red cells cannot grow when challenged with tunicamycin or by over expression of misfolded CYP. We propose that HSR can relive stress in UPR deficient cells by affecting multiple ER activities.

Cliff R. et al., (2007) selected 71 healthy women volunteers enrolled in a university based nurse practitioner program. Predictors of change in BMI were hypothesized to be cortisol secretion, dietary restraint, bingeing, mastery, mood and eating attitudes. Measures were made at the beginning of the academic semester and 12 weeks later during the participant’s examination period. It was identified individual differences that confer vulnerability to weight gain during stressful life events (dietary restraint and mastery). Given that women are exposed to daily stressors and use cognitive strategies to restrain their dietary intake, increasing awareness of the role of stress on eating behavior and weight is an important goal.

Lwow F. et al., (2007) Studies indicates that the Tarp 64 Arg polymorphism in the gene encoding the beta3-adrenergic receptor (ADRB3) is associated with obesity, insulin resistance and earlier onset of type 2 diabetes mellitus. The aim of the present study was to evaluate the frequency of this polymorphism and its relationship with obesity and oxidative stress in postmenopausal women. Performed the study on 200 women, aged 50-60 years. Estimation of anthropometric parameters and total body fat, android and gynoid fat deposits was carried out using dual energy X-ray absorptiometry. Oxidative stress was estimated by measurement of thiobarbituric acid-reactive substances (TBARS)
in serum. Blood for analysis was collected before, directly after and 6 h after a 30-min physical test on a cycle ergometer. ADRB3 genotyping was performed by polymerase chain reaction. The frequency of Trp64/Arg64 genotype in the investigated population was 12%, and of Trp64/Trp64 was 87%. The Trp64 Arg0 polymorphism of ADRB3 seems to not to be related to obesity in postmenopausal women. Moreover, the Trp64Arg polymorphism has no influence on oxidative stress intensification after standardized physical effort in postmenopausal women.

**Hachul de. C. H. et al., (2006)** investigated cardiovascular risk factors and oxidative stress parameters as well as sleep disturbance in polysomnography recording of 38 postmenopausal women with insomnia. Polysomnography recordings were performed on subjects for sleep analysis. Oxidative stress parameters were analyzed by measuring blood concentration of catalase, superoxide, dismutase (SOD), thiobarbituric acid reactive substances (TBARS) and glutathione. For cardiovascular risk factors, we measured plasma levels of hymocysteine, folic acid and vitamin B6. Findings of polysomnography recordings revealed: 68% experienced decreased sleep efficiency, 50% had apnea, 7.8% had periodic leg movements and 2.6% had bruxism (involuntary gnashing and grinding of the teeth during sleep). Results showed that the majority of subjects presented normal concentrations of the parameters studied according to standards reached in laboratory. The only notable exception was TBARS. Some clinical data, such as time of onset of menopause, may be associated with the oxidative stress status of these women, probably due to the lack of estrogen and to sleep disturbances, such as apnea.

**Evnas M. L. et al., (2005)** assessed the efficacy of the antidepressant venlafaxine (Effexor) for the treatment of postmenopausal hot flushes. In this study, 80 postmenopausal women with hot flushes (more than 14 week) were
randomized to receive either treatment with venlafaxine XR (n=40) or placebo (n=40). Venlafaxine was initiated at 37.5 mg daily for 1 week and then increased to 75 mg daily for the remainder of the study period. This study indicates that venlafaxine XR, 75 mg per day, is an effective treatment for postmenopausal hot flushes. Although venlafaxine resulted in relatively modest reduction in the frequency of hot flushes and appeared to have little or no effect on the severity on hot flushes, those subjects receiving venlafaxine experienced a significant and clinically meaningful improvement in the quality of life.

Heather M.E. et al., (2005) conducted a study with an objective to ascertain the effect of the soy protein components iso flavones and phytate on CVD risk in postmenopausal woman. In a double-blind 6-wk study, 55 postmenopausal women were randomly assigned to 1 of 4 treatments with soy proteins (40g/d) isolate (SPI): low phytate/low iso flavones (LP/LI); normal phytate/low iso flavones (NP/LI); low phytate/normal iso flavones (LP/NI); or normal phytate/normal iso flavones (NP/NI). Blood lipids (total, LDL, and HDL cholesterol and triglycerol) and oxidative stress indexes (protein carbonyls, oxidized LDLs, and 8-iso-prostaglandin-f2α) were measured at baseline and 6 wk. The oxidative stress indexes were not significantly affected by either phytate or iso flavones. It was not concluded that in postmenopausal women, phytate nor do iso flavones in SPI have a significant effect of reducing oxidative damage or favorably altering blood lipids.

2.3 REVIEW RELATED FOR NUTRITIONAL STATUS

Achle L.N. et al., (2012) conducted study on 165 menopausal women in Zaria. The subjects were selected based on some (ADD inclusion) exclusion criteria. Postmenopausal women were more likely to be overweight (mean BMI 25.96±0.53 kg/m2) compared with their premenopausal counterparts (23.13±0.57 kg/m); p<0.001. The menopausal women also had a higher waist
circumference (93.04±1.60 cm) as compared with the premenopausal women (78.87±1.30 cm); p<0.001. Only 73.86% of the postmenopausal women had a BMI$\geq$25 kg/m² whereas the prevalence of central obesity was 79%. However, there was a significant positive correlation observed between waist circumference and the body mass index (p<0.05). These findings suggest that obesity is prevalent among the menopausal women while the waist circumference was found to be a better measure in assessing obesity and thus cardiovascular risk among menopausal women in Zaria.

Gupta N. and Arora S.K. (2011) studied on 100 women. 50 were premenopausal and 50 were postmenopausal women. Result revealed that, the serum Fe (p <0.05) and the serum Ca (p <0.001) levels were found to be significantly increased, while the serum Cu (p <0.05) and the serum Mg (p <0.05) levels were found to be significantly decreased in the postmenopausal females as compared to the levels in the premenopausal females. However, there was no significant difference in the levels of serum Zn in both the groups (p >0.05).

Manios Y. et al., (2011) conducted the study on the effectiveness of a 30-month dietary intervention on vitamin D status of Greek postmenopausal women. Sixty-six postmenopausal women (55-65 years old) were randomized into an intervention group (IG), receiving a daily dose of 7.5 µg of vitamin D₃ for 12 months that increased to 22.45 µg for the remaining 18 months of intervention through fortified dairy products and attending nutrition and lifestyle counseling sessions, and a control group (CG). In conclusion, the current intervention scheme with a daily dose of 22.5 µg of Vitamin D could significantly decrease the prevalence of vitamin D insufficiency during winter time but not entirely prevent it.
Caisson P. R. et al., (2010) Used a cross sectional design, measured serum androgens in a cohort of 29 naturally postmenopausal women and correlated the results with metabolic, morph metric and functional outcome parameters. These included insulin sensitivity, whole body fat and lean body mass, visceral/abdominal fat areas and aerobic capacity. Higher serum testosterone levels were related to greater maximal aerobic capacity and reduced adiposity. Additionally, higher serum dihydrotestosterone, dehydroepiandrosterone sulfate, androstenedione, and androstenetriol glucuronidate levels were correlated to greater insulin sensitivity. In naturally postmenopausal women, endogenous androgens may play a role in the maintenance of beneficial patterns of metabolic, morph metric and functional parameters.

Lara S. et al., (2010) Conducted a study To determine whether there is an association between the level of habitual physical activity, body composition and anthropometric and metabolic variables in postmenopausal patients before and after hormone replacement therapy (HRT) Thirty four health, recent postmenopausal women (50+/2.7 years; 23.8+/-10 months since menopause) consulting for symptoms of estrogen deficiency were included in the study. Results are expressed as mean +/- SD or median and interquartile range. Log 10 transformation was used to normalize the distribution of non-Gaussian variables. ANOVA for repeated measures was performed for the active and inactive groups, before and after HT. Pearson correlation coefficient was used to investigate the relationship between anthropometric and metabolic variables and habitual physical activity. BMI and BF did not change with HRT in comparison with baseline. In contrast, a decline was observed in waist circumference (WC) and waist to hip ratio (WHR) after HRT in both active and inactive women (P<0.01). While triglycerides and glucose did not change after HRT, total and LDL cholesterol decreased from baseline. In contrast, after HRT, active patients were found to have lower BF than inactive women (active: 25.4+/-2.5; inactive:
26.6+/−2, P = 0.01). There was a significant negative correlation between habitual physical activity (number of steps per day) and BF (r=−0.36, P = 0.04). After HRT, when only active patients were considered, a significant negative correlation was found between the number of steps and WC (r= -0.42, P=0.04) and WHR (r=-0.58, P=0.03). Habitual physical activity plays a major role in preserving a favorable cardiovascular profile in postmenopausal patients using HRT.

Yang J. Jain et al., (2010) done a research that Estrogen alone cannot explain the difference in breast cancer (BC) recurrence and incidence rates in pre and postmenopausal women. In this study, our results suggest, for the first time, that an iron deficiency mediated proangiogenic environment could contribute to the high recurrence of BC in your patients, and iron accumulation associated pro-oxidant conditions could lead to the high incidence of BC in older women.

Cross sectional study done by Galan P. et al., (2009) has suggested an inverse association of dietary total iron intake and non heme iron intake with BP investigated the relationship between total, heme, and non heme iron intakes, markers of iron status, 5, 4-y changes in BP, and the incidence of hypertension.

Hejari J. et al., (2009) conducted a Study to determine the nutritional status among osteoporotic postmenopausal women in north west of Iran and compare intake of several nutrients important in terms of bone health with the standard values (DRIs). Bone mineral density of the left proximal femur, the lumbar spine and total hip were measured using dual-energy X-ray absorptiometry. Ninety-seven postmenopausal osteoporotic women were studied. A validated food frequency questionnaire was used to determine food habits and 24-h recall was used to estimate average energy and nutrient intakes. The mean t-score for bone minerals density (BMD) of LS, FN and total hip were -3.15 +/-0.73, -1.93+/−0.86 and -1.92 +/-0.88, respectively. The mean phosphate to calcium
ratio was 1.6+/−0.87 BMD of femoral neck and total hip was correlated inversely with the amount of energy obtained from fat and positively with energy intake. Among micronutrients studied, calcium was positively correlated with BMD of total hip. Most of the postmenopausal osteoporotic women in North West of Iran have a considerable deficiency in terms of energy and some micronutrients such as calcium, vitamin D and magnesium, which can be deleterious for bone health.

**Jin long Jian et al., (2009)** conducted study on estrogen deficiency. Result shows that although estrogen decreases by 90%, a concurrent but inverse change occurs in iron levels during menopausal transition. This observation has led to hypothesize that, in addition to estrogen deficiency; increased iron as a result of menopause could be a risk factor affecting the health of postmenopausal women. Further studies on iron and menopause are clinically relevant and may provide novel therapeutic treatments.

**Strychar I. et al., (2009)** conducted a study to determine the anthropometric, metabolic, psychosocial, and dietary profile of postmenopausal women according to weight cycling history, defined as the frequency of going on a diet and losing >10 kg: never (0 times) low (1 time), moderate (2 to 3 times), or frequent (>4 times). The sample of this cross sectional study consisted of 121 overweight/obese postmenopausal women enrolled in a 6 month randomized weight loss intervention between 2003 and 2006. Among 121 women, 15.7%, 24.8%, 33.9% and 25.6% were non, low, moderate, and frequent cyclers, respectively. Frequent cyclers were characterized by higher body mass index (calculated as kg/m2) (current and at 25 years of age) and percent of body fat mass, larger.

**Cheng M.A. et al., (2008)** designed a study as a 2-y randomized, placebo-controlled, double-blind trial, extended for earlier participants for up to an
additional 2 y because of interest in long-term safety and fractures. A total of 440 postmenopausal women with osteopenia were randomized to either 5 mg of vitamin K1 or placebo daily. Primary outcomes were changed in BMD at the lumbar spine and total hip at 2 y. Secondary outcome included change in BMD at other sites and other time points, bone turnover markers, height, fractures, adverse effects, and health related quality of life. This study has a power of 90% to detect 3% difference, in BMD between the two groups. The study was not powered to examine fracture or cancers, and their numbers were small. Daily 5 mg of vitamin K1 supplementation for 2 to 4 does not protect against age-related decline in BMD, but may protect against fractures and cancers in postmenopausal women with osteopenia. More studies are needed to further examine the effect of vitamin K on fractures and cancers.

Cifkova R, et al., (2008) conducted study on 908 female residents of a Prague district, aged 45-54 years (response rate, 63.9%). Three definitions of the menopause were used: self-reported menstrual characteristics, late menopausal transition, with final menstrual period 60-365 days; and postmenopausal, final menstrual period more than 365 days before the examination), levels of follicle-stimulating hormone (< or = 40 IU/l for premenopausal and more than 40 IU/l for postmenopausal women), and both. Result revealed that Age-adjusted and BMI-adjusted systolic blood pressure and diastolic blood pressure did not differ among the groups regardless of the definition of menopause. There was also no difference in the prevalence of hypertension and in the age-adjusted and BMI-adjusted odds ratio for hypertension. Multiple regression analysis testing the association between systolic blood pressure and diastolic blood pressure, and age, BMI, heart rate, smoking, and antihypertensive medication explained a rather small proportion of the BP variation. No correlation was found between BP and age in either subgroup; the closest correlation was always found between BP and BMI.
A prospective non-intervention study was conducted by Chowta N.K. et al., (2008) on 200 females belonging to the post menopausal and peri menopausal age groups. Detailed history was taken down from each subject. ECG and X-Rays of vertebra and long bones were taken whenever it was necessary. Premenopausal women reported greater number of symptoms when compared to the postmenopausal group.

Nemati A. and Bagh Naahizadeh (2008) conducted cross sectional study on (386 urban and 538 rural) aged more than 50 years from different areas of Ardebil province were selected by a multi stage sampling method, variables including age, anthropometric the food habit were recorded for each case. In order to determine dietary intake, information of 24 hours, dietary food recall was recorded for three successive days. The educational levels and some socio-demographic variables were evaluated using an appropriate questionnaire statistical comparison of means among different groups was performed using ANOVA and ‘t’ test. The results from a subgroup of women who had been going through menopause for >6 y (n=6) suggest that scFOSs may influence calcium absorption in the late postmenopausal phase. The small number of subjects and the related P value warrant verification and further investigation with women in late menopause only.

Chandla S. and Grover K. (2007) Study was done on Sixty postmenopausal women (30 vegetarians and 30 non vegetarians) in the age group of 50–60 years, clinically healthy from the various localities/strata. Background information, food and nutrient intake and anthropometric measurements of the subjects were recorded using an interview schedule. The dietary pattern of both vegetarians and non vegetarians were found to be rich due to high intake of milk and milk products, fats and sugar. Further, the diet of vegetarians contained significantly higher amount of carbohydrates, fiber, thiamine and ascorbic acid but lesser amount of protein, essential fatty acid, vitamin A, riboflavin, niacin,
vitamin $B_{12}$, iron and calcium. Percent contribution of energy by carbohydrates was higher and lower by protein and fat in vegetarians as compared to non vegetarians. The body weight of vegetarian and non vegetarian postmenopausal women were found to be higher leading the value of Body Mass Index (BMI) above the normal range of 18.5–25. Vegetarians were also reported to have significantly lower Triceps skin fold thickness (TSFT), 12.97 vs. 14.37 mm, Mid upper arm circumference (MUAC), 29.47 vs. 33.07 cm and per cent body fat (38.72 vs. 41.89%).

A cross sectional study was conducted by *Indumati V. et al., (2007)* on 150 pre and post menopausal women from SDM college of medical sciences and hospital Dharwad. The study group consisted at 75 pre menopausal women in the age group of 25-45 years and 75 postmenopausal women in the age group of 46-65 years. Bone formation marker (total calcium, ionized calcium, phosphorus, alkaline phosphates) and bone reabsorption markers (urinary hydroxyproline) were analyzed in pre and post menopausal women. The results from this study suggest that simple, easy common biochemical markers can still be used to assess the bone turnover in postmenopausal women and hence their risk of developing osteoporosis and fractures.

*Jacquotte Zeleniuch Anne et al., (2007)* undertook a study to determine the reliability a 2-year period of several newly developed iron-related assays to assess their potential for use in prospective epidemiologic studies. Results show that some newly developed iron-related assays could be useful tools to assess iron-disease associations in prospective cohorts that collect a single blood sample.

*Ravindra U. et al., (2007)* conduct a study that Old age is a significant phase in person's life and Nutritional status of an individual plays very important role which contributes to the quality of life. Researchers found that nearly 50% of the elderly subject was in the age of 71-80 yrs. Fifty eight percent of the
selected subjects were male members. More than 75% of the subjects wished to be in the company of other family members. Nearly half of the institutionalized (40%) subject had lonely feeling, forget fullness etc. Chewing betel-nut, smoking, tobacco chewing the alcohol consumption was the observed previous personnel and life style habits. Irrespective of their stay, both the selected subjects met more than 75% of the adequacy in calories, protein and fat. Nearly 50% of the subject had poor vision cataract (30%), impaired hearing 929.5% 0 difficulties in swallowing (22%) and emaciation (10-24%). Subjects were also suffering from other chronic disorders like diabetes, arthritis, asthma, hypertension, respiratory problems and GIT disturbances, with all these problems elderly subjects suffering from fear of insecurity, lack of love, care and family support system. Conclusively, the profile of the elderly in terms of socio-economic, health, nutrition and life style are similar to data found elsewhere in the country, and lack of family support system was the hallmark of the elderly.

Varghese P. J. and Abhikari P. (2007) found that ageing is an important part of all human societies reflecting the biological changes that occur, but also reflecting cultural and societal conventions, women comprise the majority of the older population because globally women live longer than men. So the study entitled evaluation of the impact of Nutritional education module and the prevalence of life style Diseases in institutionalized elderly women was conducted among 150 elderly women from different institutions of Mangalore Karnataka to evaluate the impact of nutritional intervention among them. The study indicated that majority of the subjects were suffering from life style, disease like diabetes, obesity, metabolic syndrome and hypertension etc. the mental status indicated that majority of the subjects were victim of severe depression. Statistical analysis of the scores of the pre-test revealed that the nutritional intervention was highly significant among the selected elderly women.
Arulmani J. J. et al., (2006) Conducted a study on the factors contributing to the nutritional status of the MNA classified non-institutionalized elderly women was done. The mini-nutritional assessment (MNA) tool was used to classify the elderly women into well-nourished; at risk for malnutrition and the malnourished categories. It was found from the study that apart from dietary factors, extraneous factors like age, sex, marital status, and educational status, physical, functional, social, psychological and other factors (personal habits, medical history and medications) influence significantly the nutritional status of the elderly women.

Lecube Albert et al., (2006) conducted a study to evaluate the iron deficiency as suggested in children and adolescents with overweight is also present with increasing age. For this purpose 50 consecutive postmenopausal non diabetic white women with a BMI 30 kg/m² and 50 non-obese seemingly healthily women as a control group were examined in addition to the traditional indices of iron status they measured the soluble transferrin receptor (sTfR), levels, found that obese women has higher serum sTfR levels than control subjects [1.38 range 0.89 to 2.39] vs. 1.16 mg/dl 9 range, 0.69 to 2.03 mg/dl); p < 0.001]. However, no difference in ferritin concentration was observed between the groups [70-50 (range, 18 to 19) vs., 69.50 ng/ml (range, 24 to 270 ng/mL); p = significant]. A positive correlation between BMI and sTfR concentration was detected on multiple regression analysis, BMI (positively) and ferritin (inversely) were independent predictors accounting for sTfR further the results suggest that a moderate degree of iron deficiency was also present among adult women with obesity.

Puri Sonia et al., (2006) conducted a cross-sectional study in Chandigarh, India. Systematic random sampling was used. The study population comprised of women above 40 years and resident of study area. Out of total 528 women
interviewed, 302 (56.1) were residing in urban area and rest were the residents of slums. Our study highlights that there is lack of awareness regarding menopause and related aspects especially PMB in both urban and slum population.

Ray S. et al., (2006) conducted a study on Thirst, fluid intake and urine excretion pattern of older adult and elderly females residing in Vadodara city was on 150 subjects belonging to 45-54 yrs (n=50), 55-64 yrs (n=50) and 65 yrs (n=50) age group. Data on SEC was collected by questionnaire, nutritional status by anthropometry, dietary profile by 24 hr diet recall and disease profile by checklist method. Date on thirst, fluid intake, urine excretion pattern was also collected by questionnaire and interviews. The results of SEC reported that the mean age in case of younger group was 48 yrs; 57 yrs. In age group of 55-64 yrs. and 69 yrs. in case of elderly group.. The results of thirst and fluid intake pattern revealed that majority of subjects consumed more than 6 glasses of water during summer, which is reduced to 3-5 glasses in winter. Responses of elderly with regard to water load and water restriction was not as efficient as in younger groups and significant difference was observed in urine excretion with response to water load (p < 0.05) and water intake after a period of water restriction (p < 0.01).

Albertoa Zanchetti et al., (2005) studied on 18326 women of age range 46-59 years. Researcher found that Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were slightly higher in postmenopausal than premenopausal and perimeopausal women, but so were age and BMI. Within seven biannual strata, differences in age and BMI were minimized, but SBP/DBP remained significantly higher (by 3.4/3.1 mmHg) in postmenopausal than in premenopausal subjects in the youngest stratum (46-47 years) and was also significantly higher in the stratum 48-49 years. The differences remained
significant after the exclusion of 1809 women with surgical menopause or 695 women with cardiovascular disease. Even when the confounding effects of age, BMI, smoking and contraceptive or replacement therapies were excluded by analysis of covariance, menopause was significantly and positively associated with SBP and DBP (approximately 2 mmHg difference in the age range 46-49 years).

**Oliveira De. A. and Filho M.J. (2005)** conducted a study on 217 women in Brazil to assess the nutritional status and lipid profile of postmenopausal women. The researcher found that the mean age was 60.98 + 9.23 years and obesity prevailed in 56% of the patients. The use of lipid lowering drugs was observed in 73% of the populations in regard to lipid profile, 56% and adequate serum levels of HDL-C the nutritional status was inadequate due to the prevalence of obesity, which results in the appearance of other chronic diseases such as Dyslipidemia.

**Gavalar S. J. et al., (2003)** Examine systematically the respective roles of nutrition, exercise, menopausal weight gain, moderate drinking and smoking as determinants of body mass index (BMI) and waist hip ratio (WHR) in a setting in which the role of race or ethnic group could be simultaneously or individually evaluated as predictors of BMI and WHR. Given the role of increased body fat and obesity in disease risk and the substantial differences in life expectancy among the racial and ethnic groups, the findings of this study, particularly in contrast to literature reports, strongly suggest that a whole variety of factors including hormonal status and race need to be considered when examining the role of dietary factors and physical activity in relations to estimates of body fat mass and disease risk.
**Review of Literature**

**Liu M. J. et al., (2003)** Measured plasma ferritin concentration in 620 healthy postmenopausal women aged 44-69 years who participated in the Nurses’ Health study. Food frequency questionnaires completed in 1980, 1984 and 1986 were used to calculate average dietary intakes. Our prospective data confirm that in postmenopausal women, intakes of heme iron, supplement iron, and alcohol are dietary determinants of plasma ferritin and age, PMH use, body mass index, physical activity, aspirin use, and gastrointestinal ulcer are non-dietary determinants.

**Ozbey N. et al., (2002)** conducted a study to determine the body fat distribution and cardiovascular disease risk factors in pre- and postmenopausal obese women matched for weight, height and body mass index (BMI). Study group consisted of 405 premenopausal overweight/obese (BMI > 27 kg/m2, mean 37.83 +/- 6.91 kg/m2) and 405 postmenopausal overweight/obese (BMI > 27 kg/m2), BMI-matched (mean 37.77 +/- 6.84 kg/m2) women. None of the women were on hormone replacement therapy. It is concluded that an increase in abdominal fat accumulation and unfavorable alterations in risk factors disturb postmenopausal obese women even if total body weight and BMI do not change during menopause transition. Ageing, particularly throughout the postmenopausal years, has important effects on the detrimental changes associated with Menopause.

**Vidal M. et al., (2001)** evaluated a study using anthropometric measurements, the nutritional status of postmenopausal women and men over 45 and also to estimate the intakes and dietetic sources of iron and vitamin C. 125 men and 176 women, aged 40 to 93 years, from two health centers and from Blood Donor Centre of Cartagena (Murcia) participated in the study. An anthropometric evaluation and a food intake frequency survey focusing on the previous month were carried out. Spanish food composition tables were used to...
assess the iron and vitamin C contents. To evaluate the diet in relation to iron and vitamin C, the estimated and recommended intakes for the Spanish population were compared. The distribution of weight and height, according to sex and age groups, showed significantly higher values for men than women, and showed a significant decrease with ageing. The body mass index (BMI) reached a maximum value at the age of 59 years or less in men, and from 60 to 69 in women. The prevalence of obesity (BMI > 30 kg/m²) and low weight (BMI < 20 kg/m²) was higher among the women than among the men. The P50 of the estimated iron mean intakes were 16.2 and 15.2 mg/day for men and women, respectively, and those of vitamin C were 145.1 and 147.5 mg/day for men and women, respectively. The main dietetic sources of iron were meat, vegetables and cereals, and those of vitamin C were fruits and vegetables. The estimated mean iron intake was higher than the recommended intake, and vitamin C intake was more than double the recommended level. The majority of the studied population had a satisfactory nutritional status (estimated by anthropometric measures).

2.4 REVIEW RELATED FOR LIPID PROFILE

Isoflavone and soy proteins are being considered as possible alternatives to postmenopausal hormone replacement therapy. Jassi H.K et al., (2010) conducted a study to evaluate effect of these two preparations on symptoms and lipid profile in postmenopausal women. The study were done in 75 postmenopausal women with FSH levels = 30 mole/ml. A highly significant improvement was seen in serum lipid profile and Apolipoprotein A1 and B1 in women taking soy proteins whereas women taking soy isoflavones demonstrated significant improvement in serum triglycerides only. Both soy proteins and soy isoflavones are helpful in alleviating postmenopausal symptoms but soy protein offer a greater heath advantage due to their beneficial effect on serum lipid profile.
Quadarie et al., (2010) conducted a study on the body composition and lipid profile in postmenopausal women of North-West Karnataka. To study variations in body composition and lipid profile in early and late postmenopausal women. Sixty nine postmenopausal women were selected and divided into two groups. Results: The mean values of Wt, BMI, BSA, WC, HC, FM, FFM, FMI and MM were more in Group-I compared to Group-II and WHR and BF% were more in Group-II compared to Group-I. These variations were not statistically significant. The lipid profile parameters i.e. TC, TG, HDL-C, LDL-C, VLDL-C, TC/HDL-C in Group-II subjects were found to be statistically non significant higher when compared to Group-I subjects. No statistically significant correlation was found between most of the body composition parameters and lipid profile parameters in both the groups except for the weight, BSA and FM which were significantly negatively correlated with HDL-C in group-II subjects. There was no statistically significant difference in body composition and lipid profile parameters in early and late postmenopausal women, and as well as there was no correlation between the body composition and lipid profile parameters except for Wt, BSA, FM which were significantly negatively correlated with HDL-C in Group-II subjects, which may be due to increased intra abdominal adipose tissue. It was concluded that changes in most of these parameters occur during menopausal transition due to hormonal changes and depend on physical activity, life style, diet, smoking, alcohol consumption, ethnicity and genetic makeup of individual rather than on duration after menopause.

Badaruddoza and Kaur H. M. (2009) examined a random sample of 489 pre- and 191 post-menopausal Punjabi women. Post-menopausal women had a higher blood pressure and pulse rate than pre-menopausal women (<0.001). The metric measurements such as weight, BMI, waist and hip circumferences, WHR were also higher in post-menopausal women (<0.001). In addition to that estimates of correlation and stepwise multiple regressions for blood pressure with other metric variables among pre- and post-menopausal women have been carried out.
Mešalić L. et al., (2008) analyzed the influence of menopause on the concentrations of lipids, lipoproteins and, the influence of estradiol, progesterone, FSH, LH on lipid profile in menopausal women as well. It was concluded by the study that menopause leads to changes in lipid profile by reducing HDL, and elevating apolipoprotein B levels, thus increasing the risk for cardiovascular disease. These changes were caused by reduction of estrogen concentrations in menopause.

Saghafie H. et al., (2008) Examined “association between the relationship between lipid profile and bone turnover in pre and postmenopausal women”. It was found that Serum Total cholesterol had significant inverse correlation with spine L2-L4 BMD (r=-0.152, p=0.02) and L2-L4 t-score (r=0.151, p=0.02). Low density lipoprotein (LDL) cholesterol also related negatively to spine L2-L4 BMD (r=-0.184, p=0.007), L2-L4 T score (r=-0.184, p=0.007) and L2-L4 T score (r=-0.134, p=0.04). However no relation was found between triglyceride and high density lipoprotein and lumbar spine BMD values. Whereas 35.5% of women with LDL > 130 had serum RANKL upper than percentile 75, this value was 18.7% among women with LDL<130 (P=0.01, Odds Ratio = 2.39, CI: 1.24-4.6). Osteoprotegerin had no such a relation with LDL. In univariate analysis LDL had a significant relationship with RANKL independent of age (p=0.02). As RANKL is a bone marker that show bone loss, our finding may contribute to demonstrate a negative effect of LDL on bone metabolism.

Barclog Laurie and Vega Charles (2007) conducted a study on” Physical activity may be safe and effective alternative to improve lipids and reduce cardiovascular disease (CVD) risk regardless of hormone-therapy use in postmenopausal women”. The investigators evaluated the cross-sectional relationship between physical activity and lipid and lipoprotein subclass relationship in 485 post menopausal white and African American women of
mean age 56.9+2.9 years. Compared with nonusers women using hormone
erapy (n=286) were younger, less likely to be African American; higher levels
of physical activity, large very-low density lipoprotein (VLDL) particles, and
medium high-density lipoprotein (HDL) particles; had a larger mean HD2
particle size and lower levels of total cholesterol low density lipoprotein (LDL)
cholesterol, small HDL particles, and small VLDL particles (p<0.05) regarded
of hormone-therapy use, physical activity was significantly associated with
favorable lipoprotein and lipid levels. Some relationships were found to vary
significant by hormone-therapy use, in nonusers, mean HDL parted, and LDL
particle sizes were larger (p=.01 and .05 respectively) and total and small LDL
particles sizes were lower (p=.02 for both) as activity increased these
relationships were not demonstrated in women using hormone therapy. Physical
activity was significantly related to some lipoprotein subclass regardless of HT;
however, several key lipoprotein subclasses were associated with higher levels
of activity only among non-HT users. Investigators, the promotion of physical
activity may be a safe and effective alternative to improve lipids and reduce risk
of C.V.D. in postmenopausal women.

Freemen E. W. et al., (2007) studied that “the prevalence of hot flushes; aches,
joint pain, and stiffness; and depressed mood increased in the menopausal
transition. Researcher concluded that the role of menopausal stages for some
symptoms of midlife women and indicates that stages in the transition to
menopause are associated with hot flushes; aches, joint pain, and stiffness; and
depressed mood. Fluctuations of E2, decreased levels of inhibinb, and increased
FSH levels were associated with these symptoms.

840). Results revealed that significant positive correlation of BMI, waist-size
and WHR with systolic BP (r= 0.46 to 0.13), diastolic BP (0.42 to 0.16), fasting
glucose (0.15 to 0.26), and LDL cholesterol (0.16 to 0.03) and negative correlation with physical activity and HDL cholesterol (-0.22 to -0.08) in both men and women (p<0.01). With increasing BMI, waist-size and WHR, prevalence of hypertension, diabetes, and metabolic syndrome increased significantly (p for trend <0.05). WHR increase also correlated significantly with prevalence of high total and LDL cholesterol and triglycerides (p <0.05).

There is a continuous positive relationship of all markers of obesity (body-mass index, waist size and waist hip ratio) with major coronary risk factors-hypertension, diabetes and metabolic syndrome while WHR also correlates with lipid abnormalities.

**Kerrie L. M. et al., (2007)** conducted a study on basal whole leg blood flow and vascular conductances are reduced in estrogen deficient postmenopausal compared with premenopausal women. The underlying mechanisms are unknown, but oxidative stress could be involved. We studied 9 premenopausal [23+1 yr (mean + SE)] and 20 estrogen deficient postmenopausal (55+1 yr) health women. Our results are consistent with the hypothesis that oxidative stress contributes to chronic leg vasoconstriction and reduced basal whole leg blood flow in estrogen deficient postmenopausal women. This oxidative stress related suppression of leg vascular conductance and blood flow may be linked in part to increased total and abdominal adiposity.

**Bjorm I. et al., (2006)** Investigated “personality traits and daily mood symptoms in women with a history of P.M.S. and women without, while treated with estrogen and sequential progestin”. A total of 106 women who participated in clinical trials designed to evaluate mood and physical responses to sequential estrogen and progestin therapy. There was a significant co-variation between the women who reported the highest negative mood scores during the addition of progestin to estrogen and a history of PMS women with PMS history reported
different personality characteristics as having higher scores of anxiety symptoms of muscular tension feeling more indirect aggression and lack of impulse control, and being less satisfied with their lives or childhood, compared to women without a PMS history. Women who reported the most intense negative mood symptoms during the progestin phase reported more somatic anxiety an aim to avoid monotony, a lower satisfaction with life or childhood, and higher score of indirect aggression and irritability.

Azizi F. et al., (2005) conducted a study on 2892 pre- and postmenopausal women aged 20-78 years with body mass index (BMI) > or = 25 selected from among 5791 women of the Tehran. Results shows that lower proportion of pre- and postmenopausal women with BMI > or = 35 were in quartile 1 and a higher proportion in quartile 4. A significant increasing trend was observed for odds ratio of having low HDL-C, high triglyceride, high total-/HDL-cholesterol and high fasting blood sugar (FBS) with increasing WHR. Controlling for BMI and simultaneously adjusting for confounding variables had no effect on this trend. Although no significant increasing trends were seen for having high total cholesterol, LDL-cholesterol, systolic and diastolic blood pressure with quartiles of WHR in both pre- and postmenopausal women, subjects with higher quartiles of WHR still had higher chances for having high total cholesterol. In the case of postmenopausal women having of higher odds for high LDL-cholesterol and high systolic blood pressure in the fourth quartile of WHR should also be added to the high total cholesterol.

Shrivastava Vaishali et al., (2005) Conduct a study on postmenopausal women status of antioxidant enzymes in postmenopausal women and to find their correlation with metals plasma malondialdehyde (PMDA) which is a marker of lipid per oxidation, estradiol, status of antioxidant enzymes, trace metal and lipid profile level were estimated in the blood of postmenopausal
women (n=50). The researcher found in postmenopausal women that, there was a significant decrease in estradiol reduced glutathione, glutathione peroxides, superoxide dismutase and high density lipoprotein cholesterol (HDL-C) and a significant increase in PMDA catalase zinc (Zn) total cholesterol (Tc) triglyceride (Tg), very low density lipoprotein (VLDL), and low density lipoprotein (LDL). When compared to these in the control group the changes in copper (Cu) and iron (Fe) between the groups were no significant. Superoxide dismutase showed an inverse correlation with Zn menopause is associated with oxidative stress as indicated by increase in lipid per oxidation and lipid parameters except HDL. Antioxidant enzymes like superoxide dismutase (SOD) and glutathione peroxides (GPX) decreases while casteless (CAT) increase in postmenopausal women showing oxidative.

Atalay G. et al., (2004) conducted a study on impact of aromatize inhibitors (ALS) on non-cancer related outcomes, which are known to be affected by estrogens, has become increasingly important in postmenopausal women with hormones dependent breast cancer. So far, data related to the effect of Also on lipid profile in postmenopausal women is scarce. This study, as a companion sub study of an EORTC phase II trial (10951), evaluated the impact of exemestance, a steroidal aromatize in activator, on the lipid profile of postmenopausal metastatic breast cancer (MBC) patients. The EORTC trial 10951 randomized 122 postmenopausal breast cancer patients to exemestance (E) 25 mg (n = 62) or tamoxifen (T) 20 mg (n=60) once daily as a first line treatment in the metastatic setting. Exemestance showed promising results in all the primary efficacy end points of the trial (response rate, clinical end point of this phase II trial, serum triglycerides (TRG), high density lipoprotein cholesterol (HDL), total cholesterol (TC), lipoprotein a (Lip a) and apolipoprotein (Apo) B and A1 were measured at baseline and while on therapy (at 8, 24 and 48 weeks) to assess the impact of exemestance and tamoxifen on
serum lipid profiles. Of the 122 randomized patients who received concomitant drugs that could affect lipid profile are included only if these drugs were administered throughout the study treatment. Increase or decrease in lipid parameters within 20% of baseline was considered as non-significant and thus unchanged. Seventy two patients (36 in both arms) were included in the statistical analysis. The majority of patients had abnormal TC and normal TRG, HDL, Apo A1, Apo B and Lip a levels at baseline. Neither exemestance nor tamoxifen had adverse effects on TC, HDL, Apo A1, Apo B or Lip a levels at 8, 24 and 48 weeks of treatment. Exemestance and tamoxifen had opposite effects on TRG levels: exemestance lowered while tamoxifen increased TRG Lip a levels to allow for assessment of E's impact on these subsets. The atherogenic risk determined by Apo A1: Apo B and TC: HDL ratios remained unchanged throughout the treatment period in both the E and T arms. Overall, exemestance has no detrimental effect on cholesterol levels and the atherogenic indices, which are well-known risk factors for coronary artery disease. In addition, it has a beneficial effect on TRG levels. These data, coupled with E's excellent efficacy and tolerability, support further exploration of its potential in the metastatic, adjuvant and chemo preventing setting.

Sultan N. et al., (2003) found that “there is marked difference in the risk of coronary heart diseases between men and women of reproductive age but this gap close with advancing age”. It seems likely that some factors of reproductive physiology are responsible for the study was designed to evaluate the difference in HDL cholesterol level in premenopausal and postmenopausal women in relation with change of estradiol level. Fifty premenopausal and 50 postmenopausal women were included in this study. Estradiol was estimated by radioimmunoassay while HDL-C was estimated by kit method. There was a significant (P<0.01) decrease in the HDL-C level of the postmenopausal women (46.72 + 1.007) as compared with premenopausal women (63.68 + 1.78). HDL-
C is an independent risk factor for coronary heart disease. This study favours the view that decrease in estradiol level and associated decrease in HDL-C seen in postmenopausal women may be responsible for the increased risk of coronary heart disease after menopause.

**Tornga L.P. et al., (2000)** examined the associations between lipid profiles and menopausal status, age, and obesity in Taiwanese women. The study population, established in 1990–91, consisted of 671 premenopausal and 872 postmenopausal women from the Chin-Shan Community Cardiovascular Cohort (CCCC). Studies conclude serum lipid levels in Taiwanese women are no more strongly associated with menopause and BMI than with age.

### 2.5 REVIEW RELATED TO HEALTH PROBLEMS

A study was conducted on the inter-relationships of age, menopause, and associated obesity and to assess their independent effects on aggravation of cardio metabolic risk factors in postmenopausal women by **Dasgupta S. et al., (2012)**. The result of the study concluded that Menopausal transition brings about anomalies in total body composition characterized by an increased body fat mass and central adiposity. This creates a compatible atmosphere for abnormal metabolism and aggravated cardio metabolic risk factors. Thus, menopausal status and associated obesity is the major predictor of metabolic aberrations over age in menopausal women. It was concluded after finding a significant increase in physical and metabolic factors were observed in postmenopausal women compared to premenopausal women except WC and HbA1c. Contrastingly, high-density lipoprotein cholesterol (HDL) levels and BMR were significantly decreased. After adjusting for BMI and age, the significant differences in the variables through the menopausal transition persisted, including an increase in WC. Significant correlation was observed between age and measures of general obesity such as BMI ($P < 0.05$) and fat
percentage ($P < 0.001$) but not with central obesity indices. Menopausal status and WC exerted an independent effect on most of the metabolic risk factors ($P < 0.001$ or $P < 0.01$). Fat percentage was the predicting variable for CRP, HbA1c, diastolic blood pressure ($P < 0.001$), and HDL ($P < 0.01$). But Age showed independent effect only on HbA1c.

Tandon R.V. et al., (2010) conducted a cross sectional prospective study during the period of 1 year in one of the rural health centers to study prevalence of conventional cardiovascular disease risk factors (CVRFs) in postmenopausal women. 500 consecutive post menopausal women were screened for detailed information regarding common menopausal symptoms, the presence or absence of conventional CURFs physical activity was measured and dietary life style was assessed. Use of hormone replacement theory (HRT) and other drugs were also noted, knowledge regarding their menopause was also evaluated. The researchers were found that mean age at menopause was 49.35 years, Mean number of menopausal symptoms was 6.70± 5.76, and mean duration since menopause was (MDSM=4.70years). Fatigue, lack of energy (70%), cold hand and feet, rheumatology related symptoms (60%) cold sweats, weight gain, irritability and nervousness (50%) palpitation on heart, excitable/anxiety (30%) each were common complains. Hypertension was diagnosed or a person was known hypertensive (56%) diabetes was diagnosed or a person was a known diabetic in 21% and BMI was found to be 25 kg/m2 in 78% trance. Obesity with waist-hip ratio≥0.8 in 68% females, whereas abdominal obesity with waist size ≥88 cm. was in 60% women. Dyslipidemia was seen in 39%. It was defined by presence of high TC (=200mg/dl) in 30% high LDL (=130mg/dl) in 27%, low HDL (≤40mg/dl) in 21% or high TG (=150mg/dl) in 31 % metabolic syndrome was present in 13 % of cases. CRP was found positive in 12 out of 39 total evaluated women and serum uric acid was found ≥ 6.5 mg/dl in 4% smoking (0.5%), alcohol (0%), tobacco chewing (4%), and family history of premature
heart disease (9%) were recorded. Life style was active in 35% hectic in 10% hectic and sedentary in 55% of postmenopausal women (PMWs). Only 5% of women were receiving HRT. 0.5% isoflavone containing phytoestrogens, 0.4% tibolone, 24% anti-HT, 9% anti-diabetic, 8% lipid lowering drugs, and only three patients were on anti-obesity along with dietary and lifestyle management. Out of 68 patients, who were advised for electrocardiography (ECG), 23 were found positive for ischemic heart disease (IHD). Risk factor count of more than four was found in 11%. Overall 96% of women were affected by menopause or related problems. Only 9% were aware about their menopause, 3% for importance of lifestyle modification, weight and dietary management programs to ameliorate menopause or menopause compounded CVRFs.

**Ana Paula de O M. et al., (2005)** Assessed a cross sectional study on 60 to 89 yrs old 188 outpatient women. In these patients obesity was defined by a B M I >30kg./m2(WHO, 1998) Among elderly women, 25.6% were obese. Obesity was present in the age range of 60 to 69 and 70 to 79 yrs, and positively associated (P=0.050) to fasting glycemia ≥126 mg /dL with increased risk (obese=1.76) for elder diabetic, compared to non diabetics women. The highest probability for obesity, around 18% was observed in women younger than 70yrs-old, triglycerides ≥200mg/dL. Diabetic and hypertensive, emphasizing the role of associated morbidity.

**Eva N. et al., (2005)** observed that Chronic gastrointestinal (GI) bleeding is the leading cause of iron deficiency anemia (IDA) in men older than 50 yrs and postmenopausal women. He Studied forty-eight patients with asymptomatic IDA (25 men older than 50 yrs. And 23 postmenopausal women underweight colonoscopy gastronomy and abdominal computed to tomography (CT) with contrast agent. An anemic- causing lesion was found in 14 (29%) and 16 (33%) patients in the upper and the lower GI track respectively. The prevalence of dual lesion (in both the upper and lower GI track) was low (6%) in 14(29%) patients,
malignancy, predominantly right-sided colon carcinoma, was responsible for IDA. Only one patient had a lesion in the small bowel. In 14(29%) patients the work–up was negative. Thus their prospective study demonstrates a high rate of malignancy, predominantly right-sided colon carcinoma, in men older than 50 yrs. and postmenopausal women with symptomatic IDA. This finding obligates a Complete and rigorous GI tract examination was done in this group of patients, especially of the right colon.

**Sara L. J. et al., (2005)** performed a cross sectional analysis of a population–based study of 1,017 post menopausal women (218 with diabetes), aged 55-75yrs. To found that overall, 60% of women had any incontinence in the prior month and 8% had severe incontinence. Parity and post void residual bladder volume were not associated with incontinence. Oral estrogen and vaginal estrogen uses were positively associated with a report of any incontinence but not severe incontinence but severe incontinence. A history of urinary tract infections (UTI) and measures of general health were diabetes reported disproportionately more severe incontinence, difficulty controlling urination, mixed (stress and urge) incontinence, use of pads, inability to completely empty the bladder, being unaware of leakage and discomfort with urination (P 0.06) diabetes duration treatment type peripheral neuropathy, and retinopathy were significantly associated with severe incontinence in multiple regression models adjusted for age, education, and history of UTI (P= 0.01-0.06); however, additional adjustment for BMI diminished the strength of association (P=0.17-0.52). Urinary incontinence is highly prevalent among postmenopausal women. Women with diabetes are more likely to experience severe and symptomatic urinary incontinence. UTI history is a major risk factor, post void residual bladders volume plays no demonstrable role, and BMI confounds the relationship between diabetes and incontinence among healthy postmenopausal women.
S. Schoppen et al., (2005) conducted a study on 38 healthy postmenopausal women aged between 46 and 60 yrs. Recruited from the menopause program of the Madrid city council. Physical activity, some anthropometric data and dietary information was obtained using a modified version of the dietary history method, which contained a 24-hour recall and a food frequency questionnaire covering the preceding month as reference period dietary quality indexes including those of the energy provided by macronutrients, alcohol and fatty acids and PUFA, MUFA, ISFA and PUFA SFA ratios were calculated. This group consumed a diet very similar to the traditional Mediterranean diet. Intake of vegetables (415+ 165g/d), fruits (396+/-178g/d) and fish (131+/-69g/d) was high and a wide variety of these products was consumed. Potato and cereals (157+/-76g/d) intake was low. Dairy products, meat poultry and eggs were only a modest part of this diet. The fat quality (PUFA+MUFA ISFA=2.26) was satisfactory. The diet of this group of postmenopausal women attending a prevention program closely conforms current nutrimental guidelines. Physical activity body weight and intake of vegetables food are adequate and may be very useful to counter balance the increased risk of several pathological after menopause. However consumption of carbohydrate rich foods is lower than recommended.

Awrora M. Sherman et al., (2004) Examined the baseline health related quality of life (HRQL) of 301 postmenopausal women with heart diseases enrolled in the Estrogen Replacement and Atherosclerosis (ERA) trial.. These data suggest that both clinical status variables (particularly chest pain) and the psychosocial context (represented by dimensions of relationship quality) influenced HRQL in this cohort. Thus, interventions that combine medical treatments with psychosocially based interventions may be most effective for women at risk for impaired HRQL.
Lu Q. et al., (2003) prospectively assessed the associations of long-term intakes of dietary iron and red meat with CHD risk among 6,161 women who reported diagnosis of type 2 diabetes. Data indicate that higher consumption of heme iron and red meat may increase CHD risk among women with type 2 diabetes.

Edrolin A. Lucas et al., (2002) conducted a study on “the risk of cardiovascular disease and osteoporosis drastically at the onset of menopause”. Phytoestrogens have been suggested to inhibit bone loss and protect the cardiovascular system, by improving lipid profiles. The purpose of the present study was to examine the effects of flaxseed, a rich source of the phytoestrogens called ligans, on lipid metabolism and biomarkers of bone turnover in postmenopausal women. The findings of this study indicate that flaxseed supplementation improves lipid profiles but has no effect on biomarkers of bone metabolism in postmenopausal women.

Sylvia wassertheil-smoller et al., (2004) conducted a women’s health initiative observational study followed up 93676 women for an average of 4.1yrs. Depression was measured at baseline with a short form of the center for epidemiological studies depression scale, risks of cardiovascular disease (CVD) demographic clinical, risk factor covariates. Current depressive symptoms above the screening cutoff point were reported by 15.8% of women. Depression was significantly related to CVD risk and co morbidity (odds rations ranging from 1.12 for hypertension to 1.60 for history of stroke or angina). Among women with no history of CVD depression was an independent predictor of CVD death relative risk, 1.50 and all cause mortality (relative risk 1.32) after adjustment for age, race, education, income, diabetes hypertension, smoking, high cholesterol, level requiring medication, body mass index and physical activity. Taking antidepressant medication did not associated with risk
2.6 REVIEW RELATED TO LIFE STYLE

A study conducted by **Jaana M Moilanen et al., (2012)** on the role of menopausal status and physical activity on quality of life indicates that improvement of global QoL is correlated with stable or increased physical activity, stable weight and high education, but not with change in menopausal status. This was concluded on basis of the result obtained. Result represented that peri and postmenopausal women increased their physical activity (28% and 27%) during the eight-year follow up period slightly more often than premenopausal (18%) women (p = 0.070). Menopausal status was not significantly correlated with change of QoL. QoL of the most highly educated women was more likely to improve than among the less educated ($e^b = 1.28$, 95%CI 1.08 to 1.51 p = 0.002). Women whose physical activity increased or remained stable had greater chances for improved QoL than women whose physical activity decreased ($e^b = 1.49$, 95%CI 1.23 p < 0.001 to 1.80, $e^b = 1.46$, 95%CI 1.24 to 1.73 p < 0.001 respectively). Women whose weight remained stable during follow-up also improved their QoL compared to women who gained weight ($e^b = 1.26$, 95%CI 1.07 to 1.50 p > 0.01). Women who had never used HRT had 1.26 greater odds for improved QoL (95%CI 1.02 to 1.56 p=<0.05).

Prospective studies on physical activity and diet and the onset of natural menopause are scarce. So the study was conducted with the aim to examine the association of physical activity and dietary factors potentially related to endogenous estrogen levels such as fats, dietary fiber, soy isoflavones, and alcohol with the onset of menopause in a cohort of premenopausal women. The study was done by **Nagata C. et al., (2012)** It was concluded from the result that high levels of physical activity and polyunsaturated fat intake are associated with earlier onset of menopause. Result obtained was; during the 10-year follow-up, 1,790 women experienced natural menopause. A high physical
activity level and a high intake of polyunsaturated fat were moderately but significantly associated with the earlier onset of menopause; the hazard ratios for the highest versus lowest quartile were 1.17 (95% CI, 1.02-1.34) for physical activity and 1.15 (95% CI, 1.01-1.31) for polyunsaturated fat intake. Total fat, other types of fat, dietary fiber, soy isoflavones, and alcohol were not associated with the onset of menopause.

Dalou A. R.A. et al., (2011) conducted a study on 116 women in Gaza City, Jambalaya and Shanty refugee camp. At the ages of 40 to 60 years, women suffered from intermediate symptoms of menopause were 44%, while 36% of them have light symptoms and only 20% women had no symptoms of menopause. 56% of women have no daily physical activity and 51% are obese. Results showed that statistical significance about physical inactivity and obesity among post menopause women. From nutritional point of view results showed significant dietary calcium intake and Vitamin D insufficiency and along with bad dietary habits. The results showed that women had no knowledge about nutrition and lifestyle at pre and post menopause, so they recommended a health and nutritional education targeting this group of population. Finally, it was concluded that menopause women should take healthy balanced diet and have regular physical activity and visit clinics regularly to make physical and laboratory examinations.

Epperson C.N. et al., (2011) Conducted study on sixteen pre and post menopausal women with memory complaints but no history of ADHD or other psychiatric disorders were enrolled in a double blind, placebo controlled crossover study of atomoxetine (80 mg/day). Although this study is preliminary in nature, it indicates that atomoxetine, and perhaps other medications used to treat ADHD, may be helpful for mid-life women who experience cognitive difficulties associated with the menopausal transition.
Joanna K. (2009) found that “Regular recreational physical activity has been found to be associated with a decrease in breast cancer risk in women in the majority of epidemiology studies, but research findings are inconsistent regarding the intensity of activity and timing in life”. The results also indicate a possible risk reduction among premenopausal women. These results support the hypothesis that recreational activity, particularly done early in life, is associated with a decrease in the invasive breast cancer risk in postmenopausal women. Among premenopausal women, only vigorous forms of activity may significantly decrease the risk.

A study conducted by Dorjgochoo T. et al., (2008) with an objective that Modifiable factors predicting the onset of menopause, a transition with important implications for women’s health, have not been fully characterized. study evaluated the impact of dietary, lifestyle and reproductive factors on age at natural menopause and reproductive span in Chinese women. It was concluded that In addition to reproductive factors, intake of fruits and protein, smoking, tea consumption, lifetime patterns of physical activity, and weight gain influenced the onset of menopause and/or reproductive span in Chinese women. The result obtained were early menarche, younger age at first live birth, older age at last live birth, longer duration of breast-feeding, and higher parity were associated with longer reproductive years (Ptrend < 0.01 for all). Higher body mass index at age 20, mid-life weight gain, and leisure-time physical activity during adolescence and adulthood predicted later menopause and longer reproductive span (Ptrend < 0.01 for all). Total intake of calories, fruits, and protein was positively associated with later menopause (Ptrend < 0.05 for all) and longer reproductive span (Ptrend < 0.05), except for carbohydrates (Ptre (nd) = 0.06), and long-term tea consumption predicted longer reproductive span (Ptrend = 0.03). Vegetable, fat, soy, and fiber intakes did not significantly affect reproductive span or age at menopause. Smoking was inversely associated with both early age at menopause and shorter reproductive span (Ptrend < 0.01).
Deborach J. T. et al., (2007) conducted a study on 279 postmenopausal women with type 2 diabetes participated in the Mediterranean Lifestyle Program (MLP), a randomized, comprehensive lifestyle intervention study. The intervention targeted healthful eating, physical activity, stress management, smoking cessation, and social support. Outcomes included lifestyle behaviours (i.e., dietary intake, physical activity, stress management, smoking cessation), psychosocial variables (e.g., social support, problem solving, self-efficacy, depression, quality of life), and cost analyses at baseline, and 6, 12 and 24 months. MLP participants showed significant 12 and 24 month improvements in all targeted lifestyle behaviors with one exception (there were too few smokers to analyze tobacco use effects) and in psychosocial measures of use of supportive resources, problem solving, self-efficacy, and quality of life. The MLP was more effective than usual care over 24 months in producing improvements on behavioral and psychological outcomes. Directions for future research include replication with other population.

Menopausal symptoms can affect women's health and wellbeing. It is important to develop interventions to alleviate symptoms, especially given recent evidence resulting in many women no longer choosing to take hormone replacement therapy. Exercise may prove useful in alleviating symptoms, although evidence on its effectiveness has been conflicting. With this objective a study was done by Daley A. et al., (2007) concluded with result obtained that That data suggest a positive association between somatic and psychological dimensions of health-related quality of life and participation in regular exercise. Women with BMI scores in the normal range reported lower vasomotor symptom scores and better health-related quality of life scores than heavier women. Further evidence from high-quality randomized controlled trials is required to assess whether exercise interventions are effective for management of menopausal symptoms. Result obtained was One thousand two hundred and six (50.3%) women replied.
Women who were regularly active reported better health-related quality of life scores than women who were not regularly active (P<0.01 for all significant subscales). No difference in vasomotor symptoms was recorded for exercise status. Women who were obese reported significantly higher vasomotor symptom scores than women of normal weight (P<0.01). Women who were obese reported significantly higher somatic symptoms (P<0.001) and attractiveness concern scores (P<0.001) than women of normal weight or those who were overweight.

**Dubnov R. G. et al., (2007)** found that the majority of adults are becoming increasingly overweight and especially and postmenopausal women. It is as yet unclear whether the menopausal transition itself leads to weight gain, but it is known that the physiological withdrawal of estrogen brings about changes in fat distribution that increase the risk for the metabolic syndrome, diabetes and cardiovascular disease. The treatment of postmenopausal obesity is very simple logically, but incredibly difficult – eat less and exercise more. Recent studies suggest that being active and fit is more important than losing weight; hence, a major recommendation is to exercise regularly, for at least 30 min on at least 5 days of the week, while maintaining a healthy balanced diet.

A purposive study was done by **Paola A. et al., (2006)** on the relationship between certain reproductive and lifestyle factors and the occurrence of early natural menopause. Study concluded that both reproductive and lifestyle factors are significant elements in the occurrence of early menopause in Mexican women. The results obtained were the risk of early menopause is associated with short menstrual cycles [< 26 days, OR=3.79 (IC 95% 1.37-10.52)], a short period of oral contraceptives use [<1 year, OR=2.63 (IC 95% 1.10-6.29)], a lower number of pregnancies [<2, OR=1.63 (IC 95% 1.03-2.57)], low body mass index [< 27 kg/m², OR=1.64 (IC 95% 1.10-2.43)], low schooling level [<6
years, OR=3.02 (IC 95% 1.26-7.23)], smoking history [>15 cigarettes/day, OR=2.7 (IC 95% 1.00-7.30)], and birth cohorts [>1950, OR=4.09 (IC 95% 2.62-6.39)].

Ozkan S. et al., (2005) conducted a study with a purpose of this research was to determine the relationship between menopausal symptoms and quality of life in women in the pre and postmenopausal periods. Findings of the study showed that: one hundred of the women who participated in the study were premenopausal and 71 were postmenopausal and the mean age was 47.39 (SD=6.65). No significant difference was found in pre and postmenopausal women in the comparison of their quality of physical life, psychological, social relationships and environment scores (p>0.05). The physical quality of life scores for those without vasomotor complaints in the pre and postmenopausal periods were significantly higher in those with a high educational level and women who had been menopausal between 1-5 years and more than 10 years (p<0.05). Age and HRT use in postmenopausal women were not found to affect quality of life scores (p>0.05). Result concluded was that there was no significant difference in the quality of life of pre and postmenopausal women.