# Diet and Exercise Involved During Menopause

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Abstract – Menopause is an organic maturing related wonder combined with a decrease in actual wellness, and now and then joined with passionate unsettling influence. Support of as elevated level of actual wellness as could be expected under the circumstances, which has clear connects to BMI and lipid profiles, is one of the strategies for diminishing these hindering wonders. Strolling, its variation Nordicstrolling (NW), just as running, and cycling are among the most famous proactive tasks lessening maturing or potentially menopause-related actual wellness crumbling. Similar guidance as is given to the whole populace to devour a moderate eating regimen wealthy in organic products, vegetables, entire grains, vegetables, and low-fat dairy items is probably going to diminish a portion of the negative impacts connected to menopause. Expanded utilization of soy seems, by all accounts, to be advocated as one approach to mitigate a few yet in no way, shape or form these. At present, Body Mass Index (BMI), serum levels of complete cholesterol (TC), high-thickness lipoprotein (HDL-C), low-thickness lipoprotein (LDL-C), fatty substances (TG), circulatory strain, follicle-animating hormone (FSH), and luteinizing hormone (LH) are regularly utilized as components portraying or connected to menopausal progress. Changes in systolic pulse (SBP) and diastolic circulatory strain (DBP) during the menopausal progress are most likely exclusively because old enough increment. A significant part of the usually observed changes in BMI, and serum groupings of TC, HDL-C, LDL-C, and TG are likely because of both the menopausal progress and natural age increment. Notwithstanding, socially intervened changes in eating routine and exercise designs at this stage in life may assume a part in one or the other declining or securing against these changes. As of now, we can't set up obvious conditions between the impact of activity or potentially diet on these particular boundaries characterizing the menopausal progress.

## INTRODUCTION

Maturing is joined by a wide range of components, for example, loss of postural soundness, spatial direction, and strength, that prompt a decline in wellbeing related personal satisfaction (HRQoL) for the two people. In ladies, notwithstanding, another factor that can influence HRQoL is menopause-de fi ned as the suspension of feminine cycle because of follicular exhaustion, bringing about a deficiency of ovarian affectability to gonadotropin incitement. All in all, the ovaries quit creating an egg every month. During the menopausal change, maturing follicles become more impervious to gonadotropin incitement, levels of follicle-animating hormone (FSH) and luteinizing hormone (LH) increment. The deficiency of working follicles results likewise in an emotional decrease in coursing estradiol during a period enduring from around 2 years before menopause to 2 years a short time later. The high points and low points of estrogen and, less significantly, progesterone, presumably produce the greater part of the side effects ladies experience during this change. Serum testosterone levels don't change. Ladies' mentalities towards this life change can influence its evident effect on their wellbeing. The menopausal progress starts at around 45-48 years old and keeps going quite a long while. It is combined with clinical manifestations and once in a

maybe exacerbated by an apparent loss of engaging quality. In Western culture, menopause has been "medicalized," suggesting that its indications might be diminished through specific preventive methods. This perspective has offered ascend to an assortment of "scienti fi cally demonstrated" clinical methodologies, for instance utilizing various sorts of home grown fixings all of which have either not gone through or not withstood genuine scienti fi c examination. In any case, there is one soy constituent, genistein, which may lessen the recurrence and span of hot fl cinders. At present we realize that menopause might be joined by weight pick up in some yet not all populaces and an expansion of vasomotor side effects bringing about a thermoregulatory awkwardness. These thusly might be connected to expanded adiposity-driven weight pick up, thus frequently prompting a less ideal serum lipid range. A few investigations have demonstrated that absolute cholesterol (TC) levels, lowdensity lipoprotein cholesterol (LDL-C), high-thickness lipoprotein cholesterol (HDL-C), and fatty substance (TG) levels are related with the maturing cycle, essentially, yet additionally with the menopausal progress (Fig. 3.1). Antagonistic lipid ace fi les might be related with a negatively high weight list (BMI), which is pronouncedly connected with less expansion in FSH during the menopausal change

while connected with passionate aggravation-

(Fig. 3.2), and with a previous suspension of conceptive cycles.



Fig. 3.1 The connection between lipids master fi le and menopausal status among undeveloped ladies. The bar plot demonstrates menopause or potentially age prompted changes in serum grouping of High-thickness lipoprotein (HDL-C), Low-thickness lipoprotein (LDL-C), Triglycerides (TG), and Total Cholesterol (TC) among undeveloped ladies (after Hagner et al. [11]). For effortlessness just the focal estimations of the populace are given



Fig. 3.2 The adjustments in Body Mass Index and FSH and LH action as an element of menopausal status. The bar plot demonstrates connection between Body Mass Index (BMI; kg/m 2) and action of Follicle Stimulating Hormone (FSH; IU/L) in premenopausal, perimenopausal, and postmenopausal ladies (after Wiacek et al. [12]). For effortlessness just the focal estimations of the populace are given



#### Fig. 3.3 Energy consumption as a component of specific actual work. The adjustments in energy consumption as an element of actual work: resting, strolling, Nordic skiing, Nordic strolling, weight lifting, and running. a Levine et al. [92], b Niinimaa et al. [93], c Church et al. [94], d Morgan et al. [95], e Hall et al. [96]. For effortlessness just the focal estimations of the populace are given

One technique for decreasing the actual disintegration driven by menopause or potentially maturing is keeping an elevated level of physical fi tness, which has clear connects to BMI and lipid star fi les [11]. Among the most famous proactive tasks are strolling and its variation Nordic-strolling (NW), as running, and cycling. The energy just consumptions for strolling, Nordic strolling, Nordic (crosscountry) skiing, weight lifting, and running are appeared in Fig. 3.3. Plainly diet also is critical in limiting the effect of maturing on urgent segments of actual prosperity [13]. While research offers insufficient help to create a "menopause diet" (other than maybe suggesting high admission of soy), it is critical during this season of life to eat an eating high regimen in supplement thickness and correspondingly low in energy thickness. The normal example of "crazy ride" weight reduction and gain that numerous ladies have for some time been on at this point in life would now be able to be particularly hurtful, as muscle misfortune is significantly more likely during weight reduction than muscle pick up is during weight pick up. Here, we audit various physiological changes that might be connected to menopause. We have picked BMI as the most usually revealed pointer identified with muscle versus fat and weight pick up, serum levels of TC, HDL-C, LDL-C, TG, circulatory strain, FSH, and LH. These are picked not just due to their potential general wellbeing significance, yet in addition in light of the fact that for the most part there has been more exploration on them than on the numerous others that could be analyzed.

## **OBJECTIVE OF THE STUDY**

- 1. To low-fat dairy items is probably going to diminish a portion of the negative impacts connected to menopause.
- 2. To impact of activity or potentially diet on these particular boundaries characterizing the menopausal progress.

## Weight Index

Among numerous records associating stature and weight of a person, BMI communicated as the proportion of weight in kilogram to tallness squared in meters (W/H2, Quetelet file) seems, by all accounts, to be the most steady and is the one most ordinarily utilized as a harsh proportion of adiposity. The World Health Organization set up a classification for underweight, overweight, and heftiness as indicated by BMI (Table 3.1).

Table 3.1 WHO grouping of weight appropriately to Body Mass Index

Classification	BMI (kg/m <sup>2</sup> )
Underweight	<18.50
Severe thinness	<16.00
Moderate thinness	16.00-16.99
Mild thinness	17.00-18.49
Normal range	18.50-24.99
Overweight	≥25.00
Pre-obese	25.00-29.99
Obese	≥30.00
Obese class I	30.00-34.99
Obese class II	35.00-39.99
Obese class III	≥40,00

In any case, BMI works ineffectively as a proportion of adiposity in athletic or vigorously built subjects. For instance, an athletic subject with 15-18 % muscle versus fat, basic among weight lifters, might be mistakenly classified as hefty. Better options exist, for example, the without fat mass file (FFMI) (fat free mass/ht 2) and the muscle versus fat mass list (BFMI) (muscle to fat ratio mass/ht 2) yet these require unique gear and have not been broadly enough utilized in past exploration to be utilized in this audit. While a couple of studies on BMI changes as a component of the menopausal progress show that the noticed changes are likely because of menopause, essentially [14], most find that the normally observed expansion in BMI is presumably more identified with age increments than feminine discontinuance [11], however some contend that decreases in degrees of activity are capable [15]. From a natural viewpoint, the noticed expansion in weight might be driven by a converse corresponding connection among age and resting metabolic rate [16], which might be in a roundabout way influenced by an age-subordinate diminishing in maximal oxygen take-up limit (VO 2 max). In any case, in enormous overviews in France [5] and Italy [17], there was no significant contrast in BMI by menopausal status (and hence not by age by

the same token). This may serve to advise us that social variables (and the social standards connected to them) instead of natural elements might be liable for a significant number of the distinctions we report here, particularly any that might be connected to weight pick up. Control through exercise. While practice obviously assumes a significant part in weight and BMI changes in menopausal and postmenopausal ladies [18], it's anything but an erratic movement, yet should be proceeded if these benefits are to be figured it out. As to address of which kind of activity best controls BMI, in examinations on the effect of Nordic-strolling in perimenopausal, premenopausal, and postmenopausal ladies [11], an away from part of moderate intense exercise on BMI esteems was seen across all menopausal gatherings. Fixed bike works out (about a month and a half; three times each week; 30 min for every meeting) additionally came about in significant changes in BMI [19]. Likewise, treadmill strolling/running, fixed cycling, and paddling at any rate 3-4 days out of each week for about two months brought about a significant decline in BMI in both Caucasian and African American ladies [20]. Albeit in each of the three investigations [11, 19, 20] an expansion in VO 2 max was additionally noticed, the last mentioned [20] doesn't report a factually significant increment in resting metabolic rate (RMR). This perception is somewhat bewildering considering different investigations unmistakably highlighting a positive connection among's RMR and VO 2 max [21] in premenopausal and postmenopausal ladies, however the creators guarantee that the deficiency of weight during the preparation program could make up for the absence of expansion in RMR. Control through eating routine. Recurrence of eating connects decidedly with energy admission in both premenopausal and postmenopausal ladies; in any case, just in premenopausal ladies does it associate with energy consumption. Along these lines, it isn't astonishing that just in postmenopausal ladies does recurrence of eating correspond with rate muscle to fat ratio [22]. While age shows up more significant than menopause in essence, there might be a hindering connection between menopause, diet, and exercise, prompting further weight pick up during the menopausal period. In midlife, ladies will in general roll out certain social improvements, including dietary upgrades [23]. Menopausal Spanish ladies devour more dairy items [24] and Malaysian postmenopausal ladies were found to burn-through 6 % less fat than premenopausal ladies [25]. Notwithstanding, accomplishing weight reduction or in any event, avoiding pick up during the midlife period when menopause commonly happens is testing. In one gathering of ladies 47-52 years of 2-year subsequent investigation age, а demonstrated that solitary the individuals who diminished food amount, eliminated fats/sugars, utilized a business health improvement plan, and practiced maintained a strategic distance from weight pick up [26], while others (most of whom were endeavoring to control their weight), picked up a normal of 1.2 kg. By the by, dietary intercessions can

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be compelling in decreasing weight and BMI and improving blood lipids in postmenopausal ladies [27]. In the Women's Healthy Lifestyle Project, among ladies at a normal age of 47 at gauge, conduct change endeavors over a 5-year time span (during which 35 % got postmenopausal) zeroed in on diminishing admissions of calories and cholesterol and expanding exercise trying to lessen the horrible changes ordinarily happening during menopause [28]. Weight was diminished by 0.1 kg contrasted with an expansion of 2.4 kg in the benchmark group. There been hypothesis that utilization of sov. has notwithstanding other benefits, may help with weight control. One investigation giving supplementation 99 mg is of lavones day by day for 1 year had no effect on BMI contrasted and arrangement of an equivalent measure of milk protein [29] yet an additional 3-month preliminary in postmenopausal Caucasian and African American ladies giving 20 g soy in addition to 160 mg of iso fl avones every day diminished aggregate and subcutaneous stomach fat [30]. A 6-month preliminary in postmenopausal Italian ladies of an eating regimen exceptionally high in soy (alluded to underneath as the "high soy study") brought about a non-critical abatement in BMI, yet adherence to quite a significantly changed eating routine was not high [31]

# High Density Lipoprotein Cholesterol

HDL is orchestrated in the liver and small digestive tract. HDL is made out of various apolipoproteins, including apoA-I, apoC-I, apoC-II, and the compound lecithin-cholesterol acyl transferase (LCAT). LCAT changes cholesterol over to cholesteryl esters, shaping a circular HDL molecule. This cholesterolrich lipoprotein (HDL-C) re-visitations of the liver, where the cholesterol is dumped. HDL cholesterol (HDL-C) regularly makes up 20-30 % of the all out serum cholesterol. HDL-C is frequently alluded to as the "great cholesterol" in light of the fact that epidemiological investigations have indicated that the degree of serum HDL-C is contrarily corresponding to CHD grimness and mortality, yet this defensive impact might be lost after menopause. The ATP III board changed the cut-off point for HDL-C cholesterol to 40 mg/dL for the two people, demonstrating that subjects having a cholesterol focus under 40 mg/dL were at higher danger of CHD [44] (Table 3.2). A few examinations have discovered a significant [12, 34] and reformist [45] increment in degrees of the defensive serum high-thickness lipoprotein cholesterol menopausal cycle, during the however one investigation [46] found a decline during the 2 years going before menopause and a few [5] have discovered no change. After the fi nal feminine period, the degree of HDL-C typically starts to decrease, frequently coming to the perimenopausal level [11]. One investigation found a significant decline in serum HDL-C level from pre-menopause to postmenopause [47], however hormonal levels, age gathering and BMI levels had not been satisfactorily controlled for. Specifically, it is notable that there is a converse relative relationship among BMI and HDL-C levels [48].

Hence, given the common menopause-related changes in BMI [49], all things considered, the noticed changes in HDL-C levels are menopause-driven. Control through exercise. A few investigations report an expansion in HDL-C levels disregarding an [50] absence of activity in ladies around perimenopause. Later investigations showed that independent of gauge levels [11] and paying little mind to practice power, HDL-C levels increment in ladies not long previously and during menopause [51]. Kemmler et al. [52] found that activity initiated just a nonsignificant positive change in serum HDL-C levels among postmenopausal ladies. Essentially, Hagner et al. [11] found that activity initiated significant increments in HDL-C levels in pre-menopause and perimenopause however not in the postmenopause. Cauley et al. [53] likewise found that 2 years of activity neglected to affect HDL-C levels among postmenopausal ladies. Control through eating routine. Neither a low-fat eating regimen, an activity program, nor a blend of the two expanded HDL-C in one investigation of moderately aged men and postmenopausal ladies with low benchmark HDL-C [54]. The Women's Healthy Lifestyle Project additionally neglected to change HDL-C levels [28]. In Japanese ladies in midlife, slims down with a high glycemic load, however lower in TC were related with lower serum HDL-C cholesterol focuses subsequent to controlling for menopausal status and different factors [38]. Giving an eating regimen high in monounsaturated fats will in general expand HDL-C independent of menopausal status [37]. A new methodical survey [40] reasoned that utilization of soy protein isn't related with changes in HDL-C. Likewise, the high soy study brought about no adjustment in HDL-C [31].

# Low-Density Lipoprotein Cholesterol

LDL-C particles are combined in the liver and transport cholesterol atoms to extra-hepatic tissues that require cholesterol, for instance for biosynthesis of the steroid hormones. After combination of LDLcholesterol with a cell, through a specific restricting component LDL-C particles are catabolised and cholesterol is utilized by the cell. LDL-C is the primary wellspring of vein stopping up plaque. LDL-C fixation in human blood serum has been isolated into five specific reaches as a component of wellbeing related personal satisfaction (Table 3.2). A few investigations have discovered а ceaseless expansion in LDL-C levels across pre-menopause, perimenopause [55], and postmenopause [12]. The Chin-Shan Community Cardiovascular Cohort study [56] found an expansion in LDL-C in premenopausal and perimenopausal ladies however an abatement in postmenopausal ladies. The French examination [5] found a significant increment in the predominance of high LDL and high TC joined during menopause. Control through exercise. Prabhakaran et al. [57] found that obstruction preparing may improve lipid genius fi les among premenopausal ladies however materialness to perimenopausal and

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postmenopausal ladies is to date obscure. Moderate aerobic exercise appears to influence lipid genius fi les, lessening LDL-C levels among premenopausal, perimenopausal, and postmenopausal ladies [11]. Control through eating routine. Giving an eating regimen high in monounsaturated fats decreases LDL-C levels independent of menopausal status [37]. In the Japanese investigation, abstains from food with a high glycemic load were related with higher serum LDL-C postmenopausal fixations in however not premenopausal ladies [38]. In an investigation on the influence of long term low-fat eating regimen in postmenopausal ladies, a 2.7 mg/dL decrease in LDL-C levels was noticed [42]. Notwithstanding, following 5 years of execution, The Women's Healthy Lifestyle Project couldn't decrease LDL-C. In any case, the 3.5 mg/dL increment was significantly not exactly the 8.9 mg/dL increment in the benchmark group [28]. Prediger et al. [40] discovered little proof that utilization of soy protein was related with changes in LDL-C. The high soy study brought about a non-significant decrease in LDL-C [31]. In any case, it very well might be that despite the fact that diet and exercise each alone have just a minor effect, together they appear to be ready to diminish LDL-C in perimenopausal [58] and postmenopausal ladies [54].

## Serum Triglyceride

A TG (triacylglycerol) is an atomic containing one particle of glycerol and three particles of unsaturated fats. TG are the primary parts of creature fats and vegetable oils. Practically equivalent to cholesterol TG assume a significant part in versatility of cell films and their terminals fill in as protection against cold. The connections found between serum TG levels and CHD delivered these boundaries as danger markers for CHD. For instance, TG level <sup>3</sup> 200 mg/dL is consonant with a raised degree of atherogenic factors that expansion the danger for CHD significantly more than TG alone. These perceptions were remembered for ATPIII [32] proposed TG classification, Table 3.3. Rise in blood TG levels is a subsidiary of an assortment of elements, which can be isolated into two gatherings. The first bunch includes factors identified with personal satisfaction i.e., corpulence, actual dormancy, tobacco smoking, overabundance liquor admission, and highsugar diet and the second to illnesses prompting height of TG level, i.e., type 2 diabetes, persistent disappointment, nephrotic disorder, and renal hereditary components. Two examinations [33, 59] report genuinely consistent TG levels across the menopausal progress. Notwithstanding, other have discovered a predictable expansion in TG levels alongside increments in BMI in ladies during this period [60]. A huge French overview found no expansion in heftiness with menopause except for a significant increment in TG [5]. Maturing as opposed to menopause essentially has all the earmarks of being the principle factor included [12]. Control through exercise. Exercise seems to diminish TG levels, even ladies; postmenopausal one in investigation discovered significant diminishes following 2 years of activity (four meetings for every week, 60–70 min for each meeting + two 25-min home instructional courses) [52]. Another examination got diminishes after just 10 weeks of high-impact and opposition preparing [61] and a third following 12 weeks of intense exercise [11]. A new report in young ladies found that, dissimilar to for youngsters, they had significant diminishes in TG in the quick post-practice time frame (3 h) autonomous of activity power [62].

Table 3.3 Triglyceride classifications appropriately to Adult Treatment Panel

Triglyceride category	ATP III levels (mg/dL
Normal triglycerides	<150
Borderline-high triglycerides	150-199
High triglycerides	200-499
Very high triglycerides	≥500

The base required exercise level to decrease TG levels, especially during the menopausal transition, is at present unknown. Control through diet. The Women's Healthy Lifestyle Project was unable to reduce TG but the 18.2 mg/dL increase was significantly less than the 29.9 mg/dL increase in the control group over the 5-year intervention period [28]. In the Japanese study, diets with a high glycemic load, though lower in fat, were associated with higher serum TG concentrations [38]. This effect was more pronounced in postmenopausal than premenopausal women. The high soy study resulted in a nonsignificant decrease in serum TG [31]. A recent systematic review [40] concluded that consumption of soy protein is not associated with changes in TG.

# **Blood Pressure**

The most recent couple of many years of study on hypertension related wellbeing hazard demonstrated that the specific consideration should be given to systolic pulse (SBP) changes, since these are the fundamental danger factors for cardiovascular illnesses. Broad investigation of the harmonious changes in SBP and diastolic circulatory strain (DPB) has uncovered specific age subordinate relationships between's the SPB, DPB, and the mean blood vessel pressure (MAP). SPB rises constantly to the ninth decade of life. This wonder is related with a compatible two-stage increment in the beat pressure (PP). In the first stage, DBP ascends until the period of around 50 when it might level off for the remainder of life or fall further down the road. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC) report [63] presented a classification of circulatory strain concerning human wellbeing status (Table 3.4). The French examination [5], contrasting postmenopausal and perimenopausal ladies inside a generally thin age range (normal 4 years distinction in age), discovered 14.5 % hypertension in the previous contrasted with 7.4 % in the last gathering. Zanchetti

et al. [64] likewise found an expansion in the wake of controlling for age, BMI, and different variables, however just among ladies going through menopause at a more youthful age. Another investigation of 671 ladies alluded for coronary angiography [65] found no factually significant increment in SBP as a component of the menopausal change when information were changed for age. Also, a new examination of NHANES information [34] reasoned that changes in SBP during the menopausal progress were exclusively because old enough expands (Fig. 3.4). DBP additionally doesn't seem to change across the premenopausal. perimenopausal, and postmenopausal progress [56]. Control through exercise. In the French examination [5], 46 % of postmenopausal ladies were stationary contrasted with 43 % of perimenopausal ladies and accordingly a decrease in degrees of activity was probably not going to clarify the more elevated level of hypertension in the previous gathering. An early metainvestigation of the writing on SBP among grown-up ladies [66] neglected to find any away from of highimpact practice on resting SBP. Bond et al. [67] had comparable fi ndings in premenopausal African-American ladies. Notwithstanding, a few

#### Table 3.4 Blood pressure, systolic pulse (SBP) and diastolic circulatory strain (DBP) classification as per JNC 7

SBP/DBP	JNC 7 category
<120/80	Normal
120-139/80-89	Prehypertension
≥140/90	Hypertension
140-159/90-99	Stage 1 hypertension
≥160/100	Stage 2 hypertension



Fig. 3.4 Changes in systolic pulse as an element of menopausal status [34]. Connection between Systolic Blood Pressure (SBP) as a component of menopausal status—unpublished outcomes (Wiacek and Zubrzycki). For straightforwardness just the focal estimations of the populace are given. SBP-PRE middle estimation of systolic blood in premenopausal gathering, SBPPERI middle estimation of systolic pulse in perimenopausal gathering, SBP-POST middle estimation of systolic circulatory strain in postmenopausal gathering.

# CONCLUSIONS

This examination of current information on the relationship between the menopausal progress and anthropometric and physiological boundaries, including BMI, TC, HDL-C, LDL-C, TG, LH, FSH, and circulatory strain, zeroed in on proof with respect to the degree to which diet and exercise can adjust these affiliations. In Table 3.5 we sum up our decisions dependent on current information on these affiliations. One may obviously observe that as a rule the influence of activity or diet on the specific boundary, if not obscure, is questionable. In spite of the fact that it was called attention to numerous years back that examination on these issues should have been done, including psychosocial factors, and inspecting heterogeneous populaces. impacts in little exploration of this sort has been done [89]. Accordingly, there are as yet genuine inadequacies in our insight into these connections, obstructing endeavors to improve HQoL through specific or custom fitted eating regimen as well as exercise systems. In any case, we accept that the proof so far accessible recommends that an expansion in weight and the presence of heftiness ought not be seen as firmly connected either to menopause or maturing. The majority of the perceptions recommending such a connection have so far been accounted for from North America and different social orders where diet and exercise practices, thus influenced by social, business food industry, and different elements managable to change, are in any event incompletely included. In this way, a large number of the negative changes frequently observed during menopause ought not be seen as unavoidable. The upkeep and in any event, fortifying of sound dietary and exercise propensities previously, through and even after menopause is doable [90] and will probably pay off in a more beneficial and longer-enduring [91] mature age among ladies.

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