Lifestyle Medicine as a Therapeutic Approach to Menopause: A Narrative Review

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Abstract

Background: Menopause is a normal change characterized by the end of ovarian function and lower oestrogen. It causes vasomotor, psychological, metabolic, musculoskeletal, and genitourinary symptoms, which may affect quality of life and health. As life expectancy rises, women spend more years postmenopausal. This highlights the need for effective management strategies. Hormone therapy is important, but many women seek non-pharmacological approaches for symptom relief and health promotion.

Objective: To evaluate lifestyle medicine as a primary, holistic approach for menopause symptom management and healthy aging.

Methods:
We conducted a narrative review of observational studies, randomized trials, systematic reviews, meta-analyses, and clinical guidelines. The review focused on six pillars of lifestyle medicine: nutrition, physical activity, restorative sleep, stress management, avoidance of harmful substances, and social connection.

Results: Evidence suggests lifestyle interventions improve menopausal symptoms like hot flushes, sleep issues, mood changes, and weight gain. Lifestyle changes also promote cardiovascular and metabolic health, preserve bone and muscle mass, boost psychological well-being, and lower the chance of chronic disease. Nutrition, regular exercise, stress reduction, and healthy sleep provide added benefits. These not only relieve symptoms but also promote long-term health and function.

Conclusion: Lifestyle medicine is a safe, evidence-based, patient-focused approach to menopause. Adding lifestyle changes to routine care may improve symptoms, quality of life, and healthy aging, and reduce the chance of chronic disease. More high-quality research is needed to build evidence and improve clinical practice.

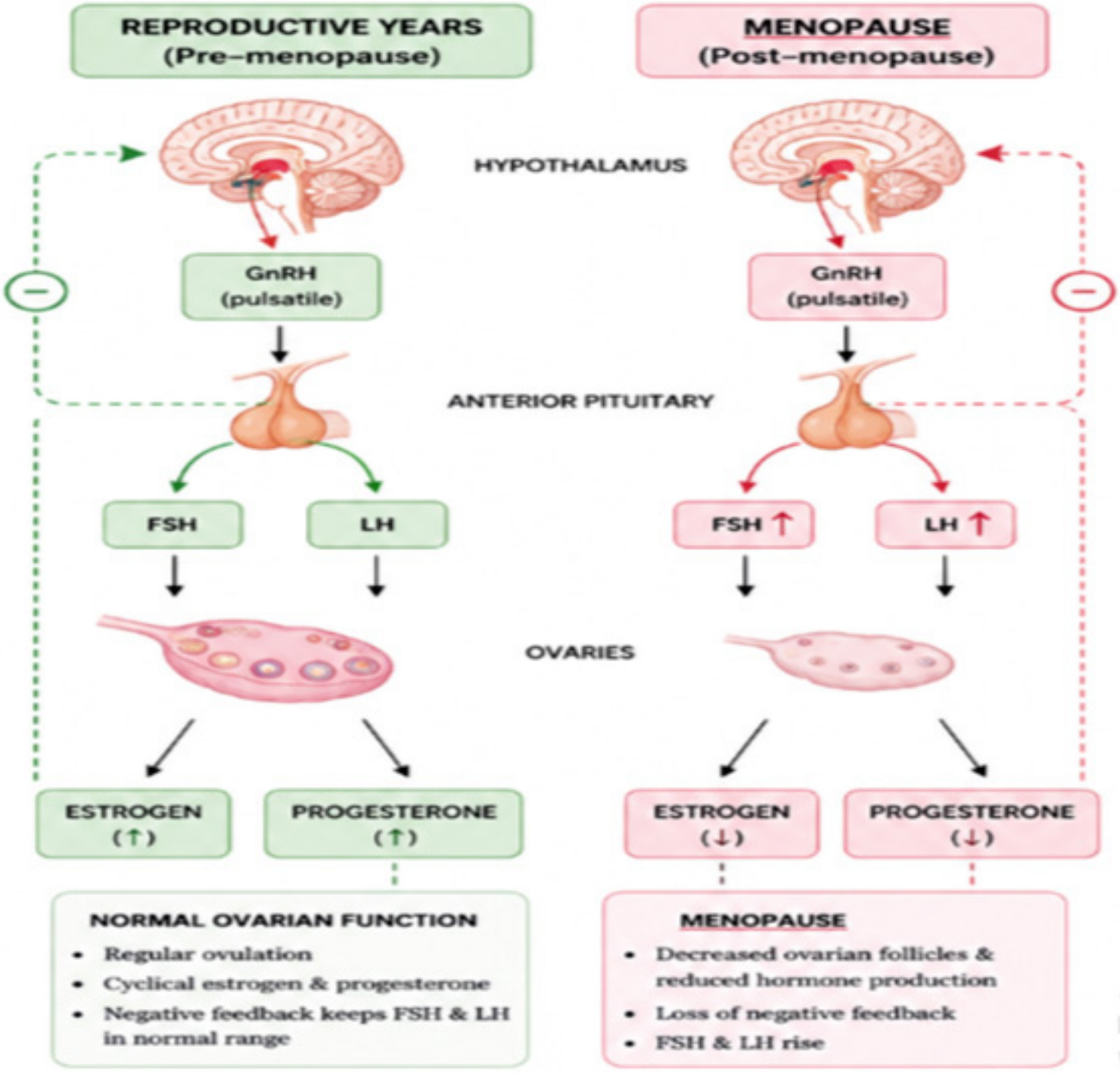
Keywords:
Menopause; Lifestyle Medicine; Healthy Aging; Women's Health; Menopausal Symptoms.

Introduction

Menopause is a life stage defined by the permanent end of menstruation (1). This happens when ovarian follicular activity is depleted (2). Diagnosis is made after 12 consecutive months of missed periods, provided there are no other causes (1). On average, women reach menopause at about 51 years of age, but this age may vary depending on geography, ethnicity, and socioeconomic status (1). As women are living longer, they spend more years after menopause. This makes menopause and its health effects an important public health issue.

The menopausal transition brings major endocrine changes, especially drops in oestrogen and progesterone (Figure 1) (4-7).

Figure 1. Hormonal changes during menopause. Adapted from Hall (4), Burger et al. (3), Davis (9).



Such hormonal shifts lead to many symptoms, such as hot flashes, sleep problems, mood changes, sexual issues, muscle and joint pains, weight gain, and lower quality of life (Table 1) (8-9).

Table 1: Role of oestrogen and progesterone deficiency in menopause

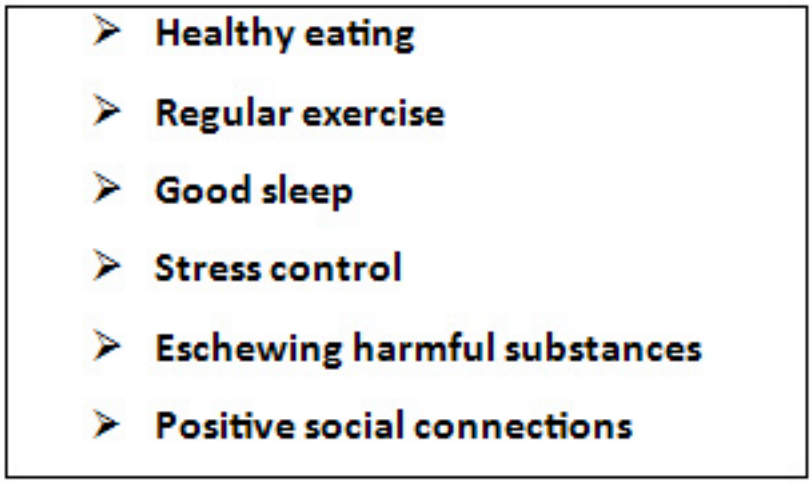
Feature	Oestrogen Deficiency	Progesterone Deficiency
Timing	Predominantly in late perimenopausal and postmenopausal women	Typically arises in early perimenopause owing to anovulatory ovarian function
Primary cause	Reduced ovarian follicular activity and depletion of ovarian reserve	Decreased ovulation resulting in reduced corpus luteum formation
Menstrual Changes	Amenorrhoea and eventual cessation of menstruation	Irregular cycles, shortened cycles, heavy or unpredictable bleeding
Vasomotor Symptoms	Hot flushes, night sweats, temperature dysregulation	May contribute indirectly but not a primary cause
Genitourinary Symptoms	Vaginal dryness, dyspareunia, urinary frequency, recurrent urinary tract infections	Minimal direct effect
Bone health	Accelerated bone loss and increased osteoporosis risk	Limited direct effect on bone metabolism
Cardiovascular Effects	Adverse changes in lipid profile, endothelial dysfunction, increased cardiovascular risk	Less clearly established
Psychological Symptoms	Mood changes, anxiety, depression, cognitive complaints	Mood instability, irritability, anxiety, premenstrual-type symptoms
Sleep Disturbance	Secondary to vasomotor symptoms and neuroendocrine changes	May contribute to insomnia because progesterone has sedative and anxiolytic properties
Body Composition	Increased visceral adiposity and reduced lean muscle mass	Less pronounced effect
Sexual Function	Reduced libido, vaginal discomfort, impaired arousal	May contribute to reduced sexual wellbeing through mood and sleep disturbances

Menopause also raises the risk of problems like osteoporosis, heart disease, cognitive decline, and metabolic conditions (10-12).

Menopausal hormone therapy (MHT) is still the most effective way to treat many symptoms (13). However, some women cannot use it, and many choose non-drug options. Interest is growing in evidence-based methods that help with both symptoms and long-term health (13)

Lifestyle medicine is a science-based field that aims to prevent, treat, and sometimes reverse chronic diseases through lasting behaviour changes (14). It has six key areas (Table 2): healthy eating, regular exercise, good sleep, stress control, eschewing harmful substances, and positive social connections (14).

Table 2: Pillars of lifestyle medicine

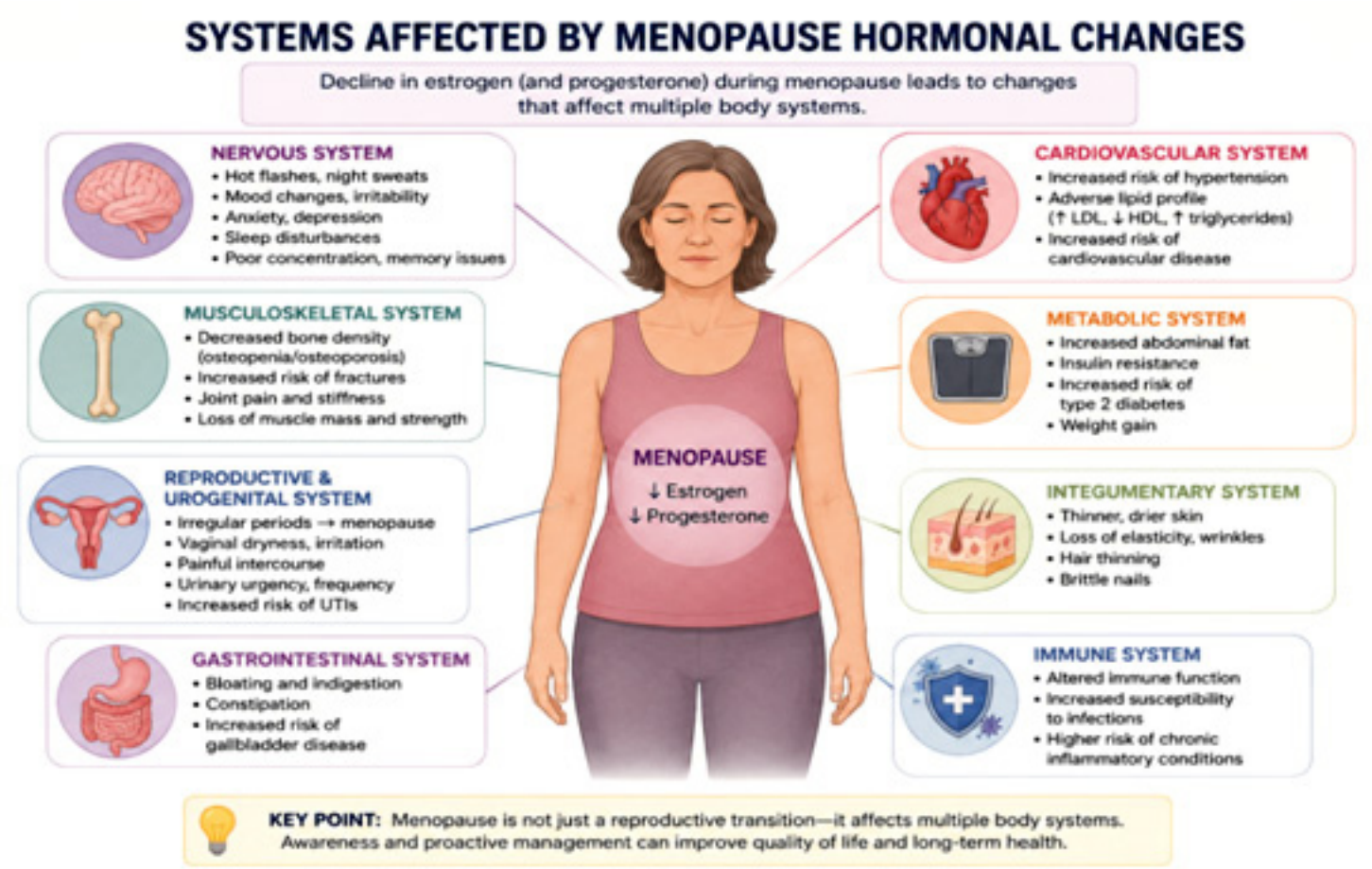


These form a strong base to support women during menopause. Research shows that such lifestyle changes can ease menopausal symptoms, improve quality of life, and lower the chance of chronic diseases linked to menopause (15-16).
This review examines how lifestyle medicine can support the management of menopause. It focuses on what the evidence says, ways to apply it in practice, and where future research needs to go.

Menopause: Physiological and Clinical Considerations

Menopause represents the final stage of reproductive aging. It is characterized by substantial endocrine and metabolic alterations (Figure 1) (3) (6). The progressive depletion of ovarian follicles results in a decline in ovarian oestrogen and inhibin production (3)(6). This leads to compensatory elevations in circulating follicle-stimulating hormone (FSH) and luteinizing hormone (LH) concentrations (3)(6). Such hormonal changes exert widespread effects on multiple physiological systems (Figure 2) (3)(6). They contribute to the multiple clinical manifestations observed during the menopausal transition.

Figure 2: Systems Affected by Menopause Hormonal Changes
Adapted from Hall et al (4), Burger et al (3), Davis (9)



The menopausal transition is conventionally categorized into three stages (3)(6):

Premenopause:
Premenopause (2) is the reproductive phase before the menopausal transition. During this time, ovarian hormone function is mostly preserved, and menstrual cycles are usually regular. Fertility is maintained, but minor hormonal changes can occur. Women in this stage usually have few menopausal symptoms and stable hormonal function.

Perimenopause:
Perimenopause (2) is the transition phase leading to menopause. It includes the time up to 12 months after the final menstrual period. During this stage, the number of ovarian follicles drops. Estrogen and progesterone levels fluctuate. Menstrual cycles become irregular. Symptoms such as hot flushes, mood changes, sleep problems, and metabolic changes may appear.

Postmenopause:
Postmenopause (2) starts 12 months after the final menstrual period and continues after that. The ovaries stop producing eggs and oestrogen levels stay low. This stage brings changes that raise the risk of osteoporosis, heart disease, genitourinary issues, and metabolic problems.

Beyond symptom burden, oestrogen deficiency is associated with several chronic health effects. These include accelerated bone loss and increased risk of osteoporosis (3). Oestrogen deficiency also leads to adverse alterations in body composition, with increased central adiposity (3). It is linked to insulin resistance, dyslipidaemia, and an elevated risk of cardiovascular disease (3). Emerging evidence also points to possible associations between menopause and cognitive decline in susceptible individuals (3).

Consequently, menopause should be regarded not only as a reproductive milestone but also as an important period for preventive healthcare and risk-factor modification (3). In this context, lifestyle medicine offers an all-encompassing framework for tackling both the immediate symptoms of menopause and the long-term health risks associated with hormonal aging. This approach supports healthy aging and improves quality of life in midlife and older women.

Pillars of Lifestyle Medicine (Table 2)
Lifestyle medicine uses lifestyle interventions to prevent, treat, and manage chronic diseases (14). It targets behavioural and environmental health factors by facilitating sustainable changes in daily habits (14).

Lifestyle medicine is built on six related pillars (14):
1. Whole-Food, Plant-Predominant Nutrition
Consume mostly whole, minimally processed plant-based foods; limit ultra-processed items and saturated fats.
2. Consistent Physical Exercise
Regularly perform a mix of aerobic, resistance, flexibility, and balance exercises.
3. Reparative Sleep
Adequate quality sleep supports brain, hormone, and immune health.
4. Stress Management
Use mindfulness, relaxation techniques, cognitive strategies, or support to reduce chronic stress.
5. Avoidance of Risky Substances
Avoid tobacco, excess alcohol, and other harmful substances for health.
6. Positive Social Connections

Building supportive relationships and engaging socially enhances well-being and mental strength.
These pillars address many biological, behavioural, and psychosocial factors in menopausal symptoms and the higher chance of chronic disease during menopause and after.

Nutrition and Menopause

Role of Nutrition in the Management of Menopausal Symptoms
Nutrition is a core part of lifestyle medicine. It is one of the most accessible, cost-effective, and sustainable interventions for women during menopause. Dietary habits affect many systems influenced by menopause (17). These include endocrine regulation, body composition, cardiovascular function, bone metabolism, inflammatory pathways, and psychological health (18).

More evidence suggests that diets high in fruits, vegetables, whole grains, legumes, nuts, and unsaturated fats improve health in menopausal and postmenopausal women (19). These foods are rich in fibre, antioxidants, vitamins, minerals, and phytoestrogens (19). These nutrients may help lower vasomotor symptoms, maintain bone mineral density, improve cardiometabolic health, and reduce cardiovascular risk (19). Following nutrient-dense diets is also linked to reduced inflammation and improved quality of life.

Optimizing nutrition is a main part of lifestyle medicine for menopause (19). It helps relieve symptoms and lowers the risk of problems such as osteoporosis, cardiovascular disease, obesity, and metabolic dysfunction (19).

Mediterranean Dietary Pattern (20)

The Mediterranean diet is often studied in relation to menopause. It focuses on eating (Figure 3):
- Fruits and vegetables
- Whole grains
- Legumes
- Nuts and seeds
- Olive oil as the principal source of dietary fat
- Fish and seafood
- Moderate consumption of dairy products

Figure 3: A new Mediterranean diet pyramid. Adapted from Sofi et al (87)

Studies show that sticking to the Mediterranean diet brings many health benefits for menopausal women (20). These include:

- Reduction in the frequency and severity of vasomotor symptoms
- Improved cardiovascular risk profiles
- Enhanced glycaemic control and metabolic health
- Lower concentrations of inflammatory biomarkers
- Improved overall quality of life and psychological wellbeing

The Mediterranean diet's benefits may come from its anti-inflammatory, antioxidant, and heart-protective properties. It also helps control weight and supports metabolic function (21). As a result, this diet is seen as a proven way to support health during menopause and beyond (21).

Phytoestrogens

Phytoestrogens are naturally occurring plant-derived bioactive compounds that display weak oestrogenic and anti-oestrogenic properties through their interaction with oestrogen receptors (22). Among these compounds, isoflavones have been the most extensively investigated for menopausal symptom management. Rich dietary sources of isoflavones include soy-based foods such as soybeans, tofu, tempeh, edamame, and soy milk (23). Soy isoflavones are promising for managing menopausal symptoms but are not as potent as hormone therapy (23).

Phytoestrogens in menopausal women with positive oestrogen tumours:
Phytoestrogens are plant-derived compounds structurally like oestradiol that bind oestrogen receptors, with relative selectivity for ER-β (88-91). In postmenopausal women, they are primarily obtained from soy isoflavones, flaxseed, and legumes and are used to relieve vasomotor and metabolic symptoms. Their safety in women with oestrogen receptor–positive (ER+) tumours is still an area under ongoing investigation (88-91). Evidence from randomized controlled trials of soy isoflavone supplementation in postmenopausal women and breast cancer survivors, together with prospective cohort data such as the Shanghai Breast Cancer Survival Study and subsequent meta-analyses, demonstrates no significant increase in recurrence or mortality (88-91). Overall findings are heterogeneous but generally reassuring, supporting cautious individualized clinical use pending further long-term randomized evidence.

Transitioning from phytoestrogens, it is important to also consider lifestyle elements that impact menopausal health, such as weight management.

Weight Management
Weight gain is a common feature of the menopausal transition and results from a complex interplay among hormonal alterations, aging-related metabolic changes, declining physical activity, and changes in body composition (24). Menopause is associated with an increase in visceral adiposity, a reduction in lean skeletal muscle mass, and a decline in resting metabolic rate, all of which lead to progressive weight accumulation (24).

In addition to food choices, maintaining a healthy weight confers multiple health benefits during menopause. Excess adiposity during midlife is associated with adverse health outcomes, including increased vasomotor symptom burden, heightened cardiovascular risk, development of type 2 diabetes mellitus, osteoarthritis, and impaired quality of life (25). As a result, weight management is a key element of comprehensive menopausal care (25). Lifestyle interventions focusing on dietary modification and regular physical exercise represent the foundation of weight management strategies. Clinical evidence shows that even a modest weight reduction of 5–10% of initial body weight can improve menopausal symptoms, metabolic parameters, and general health outcomes (26).

Nutritional Considerations for Bone Health
The postmenopausal period is characterized by accelerated bone loss secondary to oestrogen deficiency, resulting in an increased risk of osteopenia, osteoporosis, and fragility fractures (27-28). Optimizing nutritional status is therefore essential for the preservation of skeletal health.

Key nutrients involved in bone metabolism include calcium, vitamin D, magnesium, vitamin K, and dietary protein. Adequate intake of these nutrients aids bone mineralization, maintenance of bone mass, and musculoskeletal function (29). When combined with regular weight-bearing and resistance-based exercise, appropriate nutritional strategies help substantially prevent osteoporosis and reduce fracture risk in postmenopausal women (29).

Physical Activity and Menopause (Figure 4)

Role of Physical Activity in Menopausal Health
Physical activity is an effective non-pharmacological intervention for menopausal health (30). Regular exercise benefits cardiovascular function, metabolic health, musculoskeletal integrity, psychological well-being, and quality of life (30). Structured activity reduces symptom severity and may help prevent long-term diseases often seen in postmenopausal women (31).

International guidelines recommend adults get 150 minutes of moderate-intensity aerobic activity per week (32). People should also do muscle-strengthening exercises at least two days each week (32). Balance and flexibility training are also encouraged to increase function and reduce fall risk (32).

Aerobic Exercise
Aerobic exercise includes walking, cycling, swimming, jogging, and dancing. Regular participation improves cardiorespiratory fitness and insulin sensitivity (33-35). It also lowers blood pressure, aids weight management, and boosts psychological well-being (33-35). Studies show active menopausal women have fewer symptoms, including better mood, fewer vasomotor symptoms, and overall quality of life (33-35).

Resistance Training

Resistance training is vital during menopause. Declining oestrogen increases loss of skeletal muscle and strength (36-37). Regular strength training helps preserve lean mass, raise metabolic rate, improve glucose metabolism, and maintain bone density (38). It also supports functional performance and independence and reduces the risk of frailty and disability later in life (38).

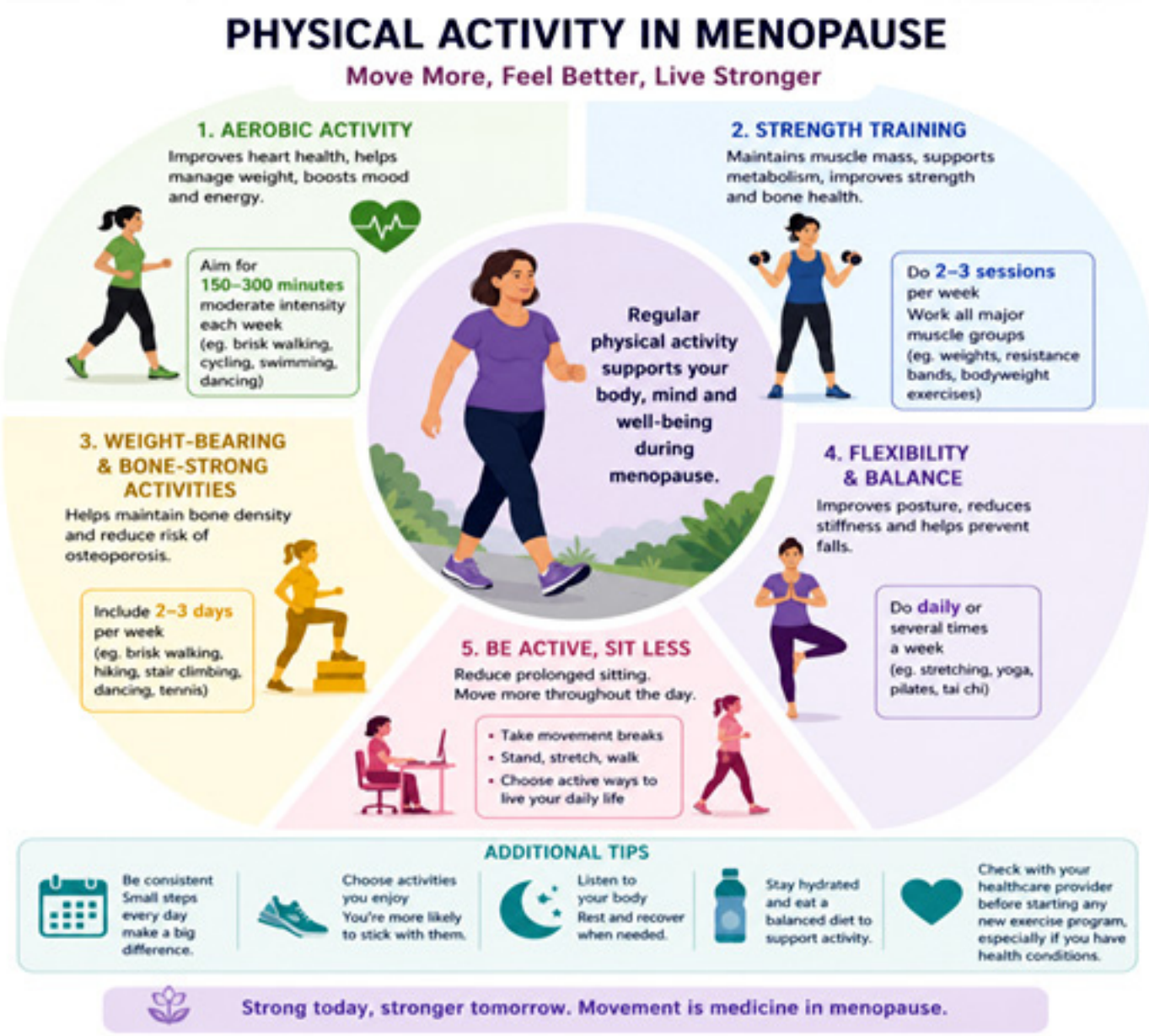
Exercise and Skeletal Health

Weight-bearing and resistance exercises maintain bone health during and after menopause (39-40). Walking, stair climbing, resistance training, dancing, and hiking stimulate bone formation and help slow bone loss linked to oestrogen deficiency. Programs that combine resistance training with impact activities are especially effective at preserving bone density and decreasing the risk of osteoporosis and fractures (39-40).

Exercise and Psychological Wellbeing

Physical activity offers many psychological benefits. These include endorphin release, better sleep, reduced inflammation, and higher self-efficacy (41). Evidence shows regular exercise reduces depression, anxiety, stress, and distress in menopausal women (33-35). Therefore, physical activity is key in comprehensive menopausal care for boosted mental and physical health.

Figure 4: Physical activity in women with menopause



Sleep and Menopause

Sleep Disturbances during Menopause (Figure 5)
Sleep disturbances are among the most prevalent and burdensome symptoms during the menopausal transition (42-47). These issues affect up to 60% of women (42-47). Common complaints include difficulty falling asleep, frequent nighttime awakenings, early-morning awakenings, and non-restorative sleep (42-47). The causes of sleep dysfunction during menopause are multifactorial. They may include vasomotor symptoms, especially nocturnal hot flushes and night sweats, mood disorders, changes in circadian rhythm, obstructive sleep apnoea, and psychosocial stressors (42-47).

Poor sleep quality has major consequences for overall health and wellbeing. It contributes to declined cognitive performance, emotional dysregulation, reduced physical functioning, increased cardiometabolic risk, and lower quality of life (42-47).

Lifestyle-Based Strategies for Improving Sleep
Several lifestyle changes, supported by research (42-47), have been shown to help women in menopause sleep better.

- ***Sleep Hygiene***

Optimizing sleep hygiene is a key part of sleep management. Recommended practices include keeping steady sleep and wake times and creating a comfortable, quiet sleep environment (42-47). Other suggestions are limiting caffeine and other stimulants, avoiding large meals near bedtime, and limiting evening screen exposure (42-47).

- ***Physical Activity***

Regular physical exercise consistently improves sleep quality and capability (34-35). It also reduces insomnia symptoms. Both aerobic and resistance exercise benefit sleep outcomes in midlife women (34-35).

Stress Reduction
Stress-management interventions, such as mindfulness and relaxation techniques, may reduce hyper-arousal, thereby supporting sleep initiation and maintenance (48-50).

Weight Management
Maintaining a healthy weight is important given the rise in obesity and sleep-disordered breathing in midlife. Weight loss improves sleep and reduces the risk and severity of obstructive sleep apnoea (51).

Apart from physical health considerations, it is also important to address stress management and mental health, particularly during the menopausal transition.

Menopause often occurs alongside major life events and stressors, such as job changes, caregiving, aging parents, and shifting relationships. Hormonal changes can also affect mood and mental health (52).

Common psychological symptoms during menopause are anxiety, depression, irritability, mood swings, and lower self-confidence. These may impair daily life and quality of life (52).

Mindfulness-Based Interventions
Mindfulness entails maintaining present-moment awareness with a non-judgemental attitude (48-50). Evidence suggests mindfulness-based interventions can decrease perceived stress, anxiety, and depressive symptoms, while also improving sleep quality plus distress from vasomotor symptoms (48-50).

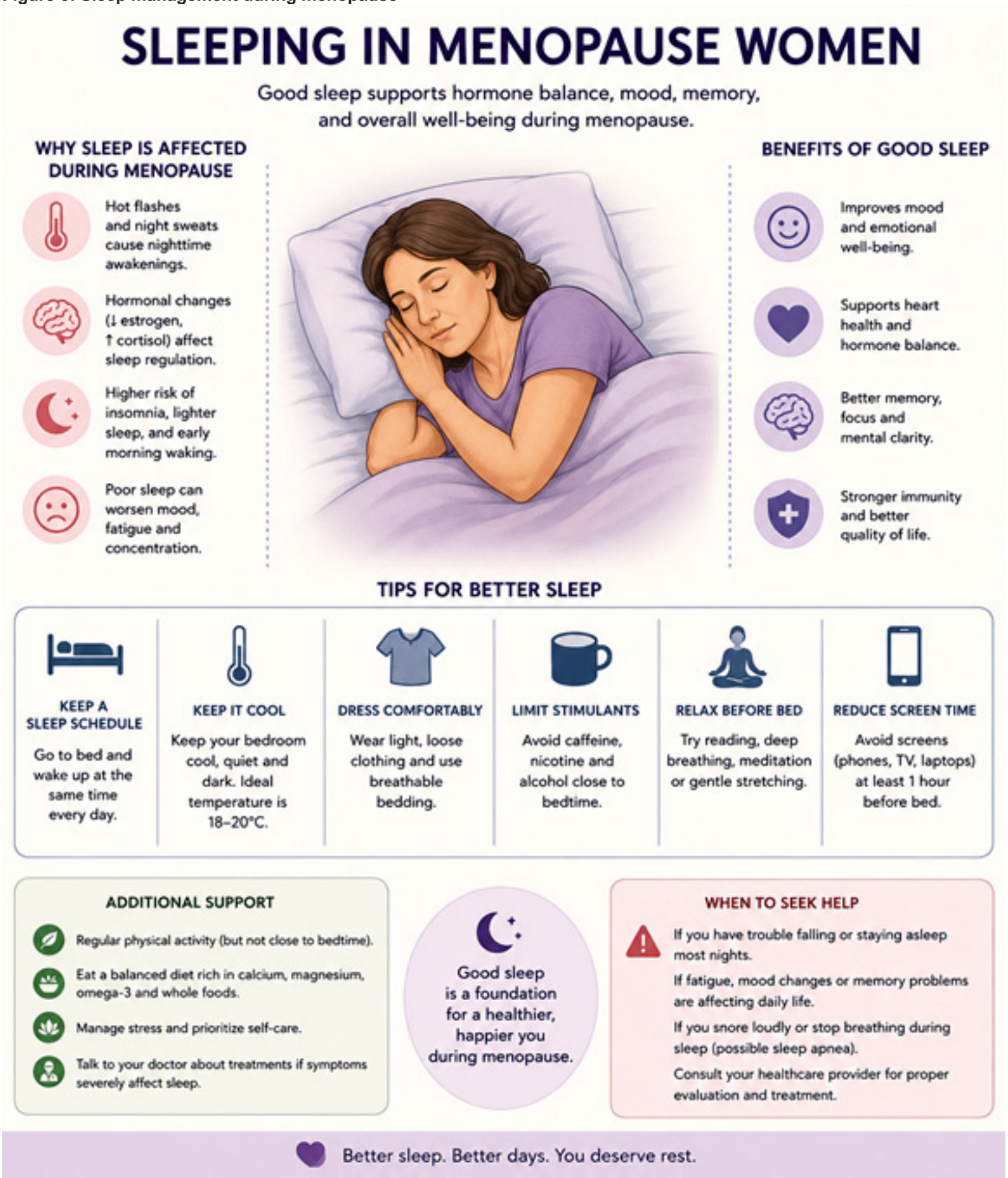
While mindfulness may not reduce the frequency of hot flushes, it can enhance symptom acceptance, coping, and fortitude (48-50).

Cognitive Behavioural Therapy
Cognitive behavioural therapy (CBT) is a well-studied, effective non-pharmacological option for menopausal symptom management. Evidence supports its role in reducing insomnia, anxiety, depressive symptoms, and vasomotor symptom burden, while improving quality of life (48).

CBT helps build coping strategies, supports behaviour change, and identifies and changes unhelpful thought patterns (48).

Relaxation Techniques
Other evidence-backed techniques for mental health include deep breathing, muscle relaxation, yoga, meditation, and tai chi (53-55). These help regulate the nervous system, reduce stress, and build resilience throughout menopause (53-55).

Figure 5: Sleep management during menopause



Social Relationships, Social Support, and Menopausal Health

Social connectedness is an important but often overlooked determinant of health during menopause (56-57). Evidence shows that strong social support networks improve psychological well-being (56-57). They help with coping strategies, promote adherence to therapy, and increase quality of life (56-57). Women with supportive relationships, family, friends, or community, report less menopausal distress and more ability in handling symptoms (56-57).

Group-based lifestyle medicine interventions may offer added benefits (58). They foster social engagement, peer support, and accountability (58). This helps facilitate sustained behavioural change and supports wellbeing.

Avoidance of Dangerous Substances

Smoking
Tobacco use leads to many negative health outcomes during menopause. Smoking is linked to earlier menopause, worse vasomotor symptoms, higher cardiovascular risk, faster bone loss, and poorer health overall (59). Quitting smoking should be a priority for women going through menopause.

Alcohol Consumption
Excessive alcohol use can worsen many menopausal symptoms. These include sleep problems, vasomotor symptoms, and mood complaints (60). Alcohol use also raises the chance of chronic diseases like breast cancer, hypertension, and liver disease (60). Alcohol guidance should be customized to each woman's risk. Promote moderation or abstinence as appropriate.

Cardiovascular Health and Menopause

Cardiovascular disease is the leading cause of death for women worldwide (61). As women approach menopause, their bodies produce less oestrogen. This change leads to negative effects on heart health (62). Women may see higher LDL cholesterol, lower HDL cholesterol, endothelial dysfunction, more abdominal fat, and insulin resistance (62).

Lifestyle medicine is important for lowering the risk of heart disease during and after menopause (63-64). Studies show (63) that a better diet, regular exercise, maintaining a healthy weight, controlling blood pressure, and keeping blood sugar stable all help reduce the risk of heart disease. The time around menopause is key for assessing heart risks, offering prevention advice, and starting healthy lifestyle changes to protect long-term health (64).

Metabolic Health and Diabetes Prevention

Menopause increases the risk of metabolic syndrome and type 2 diabetes (65). This happens because of hormonal and physical changes. The main causes include increased belly fat, lowered muscle mass, greater insulin resistance, and lowered physical activity (65). Together, these issues raise metabolic and heart health risks.

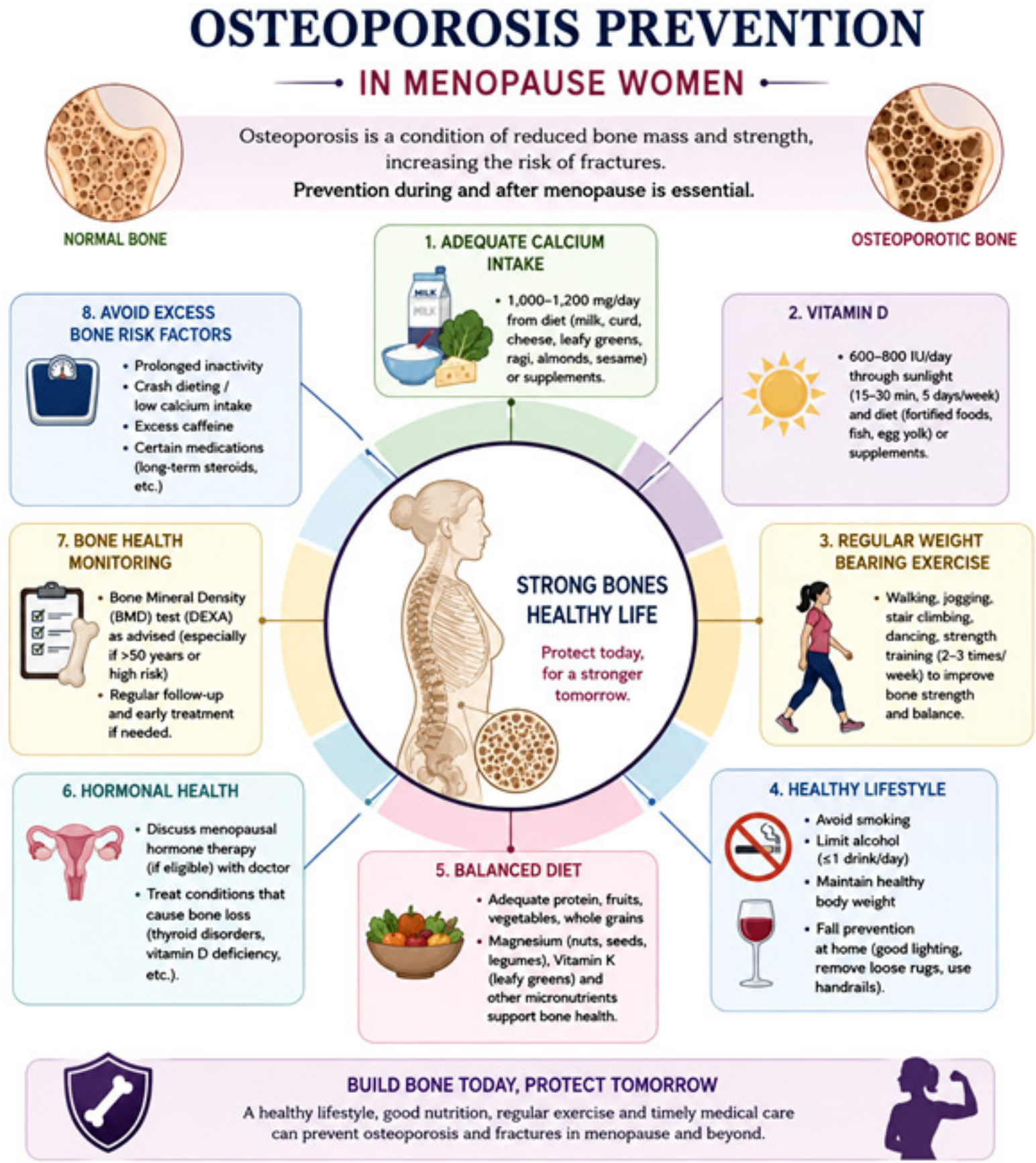
Lifestyle changes are key for preventing diabetes and staying healthy during midlife. Research shows a better diet, regular exercise, and weight control can prevent prediabetes from turning into diabetes (66). These changes also improve blood sugar, insulin sensitivity, body composition, and other health measures.

Osteoporosis Prevention through Lifestyle Medicine

Osteoporosis is a major cause of illness and reduced quality of life for postmenopausal women (40). Lower oestrogen levels accelerate bone loss and reduce bone mineral density, increasing the risk of fractures (36-37).

Lifestyle-based strategies are important for maintaining bone health (40). These include regular resistance training, weight-bearing activity, adequate intake of calcium and vitamin D, quitting smoking, and limiting alcohol intake. Starting these approaches early in menopause may lower fracture risk and support musculoskeletal health in the long term (Figure 6).

Figure 6: Bone health in menopausal women



Sexual Health and Intimate Relationships

Menopause can harm sexual health and relationships in several ways (67-68). Common causes include vaginal dryness, pain during sex, less desire, and psychological difficulties such as anxiety, depression, or low self-esteem (68).

Lifestyle changes can improve sexual wellbeing (69-71). They boost cardiovascular health, enhance body image, lower stress, and sustain mental health. A thorough approach should also include open partner communication, relationship support, and healthcare teams addressing sexual dysfunction during menopause (69-71).

Lifestyle Medicine and Menopausal Hormone Therapy

Use lifestyle medicine alongside standard menopausal care. Do not use it as a replacement for medical therapies. In women on menopausal hormone therapy, lifestyle change can improve overall health and lessen disease risk.

If women cannot or do not want hormone therapy, lifestyle medicine offers useful non-drug ways to control symptoms and prevent disease. Merging medical treatment with lifestyle changes is likely to yield the best results for symptoms, function, and long-term disease prevention (72-73).

Future Directions

State-of-the-art research is revealing new possibilities toward personalized lifestyle medicine in menopausal health. Exciting frontiers comprise precision nutrition, digital health coaching, wearable health-monitoring technologies, microbiome-targeted interventions, and individualized exercise prescription.

Prioritize evaluating long-term clinical outcomes, building effective implementation strategies, and addressing health equity in future research. Take concrete steps to ensure wider access and optimize lifestyle medicine interventions for different populations of menopausal women.

Clinical Trial Evidence Supporting Lifestyle Medicine in Menopause

The body of evidence for lifestyle medicine interventions in menopausal women has grown significantly over the past two decades. Menopausal hormone therapy is still the most effective treatment for vasomotor symptoms. However, a growing number of randomized controlled trials, prospective cohort studies, and systematic reviews show that lifestyle interventions improve menopausal symptoms, cardiometabolic health, psychological well-being, skeletal health, and quality of life. Importantly, lifestyle medicine addresses more than just symptom management (Table 3). It helps prevent chronic diseases that become more common after menopause.

One influential study examining lifestyle modification and menopausal health was the Women's Health Initiative Dietary Modification Trial (74). The study enrolled more than 48,000 postmenopausal women. It tested a low-fat diet that emphasized fruits, vegetables, and whole grains. The main outcomes focused on heart disease and cancer prevention. Secondary analyses showed that women with significant weight loss saw significant decreases in vasomotor symptoms. Those who lost at least 10% of their starting body weight were most likely to report the complete resolution of hot flushes and night sweats. These results provided early evidence that diet and weight management can help control menopausal symptoms.

Further support for behavioural interventions came from the MsFLASH research network (75-76). This multicentre program ran several RCTs on non-hormonal treatments for menopausal symptoms. One trial studied aerobic exercise, yoga, and omega-3 fatty acids in peri- and post-menopausal women with vasomotor symptoms (75-76). Exercise was not always effective in reducing hot flushes. However, researchers observed considerable improvements in sleep quality, physical function, mood, and health-related quality of life. The data show that exercise has clinical benefits beyond direct reduction of vasomotor symptoms.

Psychological interventions have similarly demonstrated substantial efficacy. The MENOS 1 and MENOS 2 randomized controlled trials (77-78) evaluated cognitive behavioural therapy (CBT) in women experiencing bothersome vasomotor symptoms. Both studies (77-78) found significant reductions in hot flush problem ratings, insomnia severity, anxiety, and depressive symptoms. Importantly, these improvements were sustained during long-term follow-up, supporting the durability of CBT-based interventions. Evidence suggests that CBT primarily enhances symptom appraisal, coping strategies, and psychological adjustment rather than directly reducing the frequency of vasomotor symptoms, illustrating the importance of behavioural and cognitive factors in menopause management.

Further evidence is provided by the Women's Healthy Lifestyle Project (WHLP) (79), a longitudinal randomized trial assessing the effects of dietary counselling, structured physical activity, and behavioural support initiated before menopause and continued throughout the menopausal transition. Women assigned to the intervention group experienced significantly less weight gain, smaller increases in waist circumference, and more favourable lipid profiles compared with control participants. This evidence indicates that early adoption of healthy lifestyle behaviours may mitigate many of the adverse metabolic changes associated with menopause.

Exercise-based interventions have regularly demonstrated benefits for cardiometabolic health and functional capacity. The Sedentary Women Exercise Adherence Trial (SMART) (80) evaluated structured aerobic exercise programs among midlife women and found significant improvements in cardiorespiratory fitness, body composition, insulin sensitivity, and mental health. Although the effects on vasomotor symptoms were variable, participants experienced considerable improvements in physical functioning and overall quality of life. These outcomes support current clinical recommendations that advocate regular physical exercise as an essential element of menopause management.

Similarly, the SHAPE-2 trial (81) compared exercise-induced weight loss with dietary-induced weight loss among postmenopausal women. Both approaches produced significant improvements in body composition and metabolic health indicators. However, exercise-induced weight loss was associated with greater preservation of lean muscle mass and superior improvements in physical fitness. These findings highlight the value of integrating physical activity with dietary modification to optimize health outcomes during and after the menopausal transition.

The potential role of nutritional interventions has also been examined through randomized controlled trials investigating phytoestrogen supplementation. Numerous studies evaluating soy isoflavones (82-83) have demonstrated modest reductions in the frequency and severity of vasomotor symptoms. Meta-analyses generally report reductions in hot flush frequency of approximately 20–30% relative to placebo (84). Although the magnitude of benefit is less than that achieved with menopausal hormone therapy, soy-based interventions (84) may represent a useful non-hormonal option for women seeking alternative approaches to symptom management. Variability in treatment response may be attributable to differences in gut microbiota composition, isoflavone metabolism, dosage, and baseline symptom severity.

Collectively, these clinical trials provide robust evidence supporting the integration of lifestyle medicine into comprehensive menopause care. While lifestyle interventions may not consistently achieve the degree of symptom relief observed with hormone therapy, they offer broad-ranging benefits across multiple health domains, including metabolic health, cardiovascular risk reduction, psychological wellbeing, physical function, and long-term disease prevention. Consequently, lifestyle medicine should be considered a foundational component of evidence-based menopause management.

Bone health constitutes a critical target for lifestyle medicine interventions during the postmenopausal period. Evidence from the LIFTMOR (Lifting Intervention for Training Muscle and Osteoporosis Rehabilitation) trial (85) demonstrated that supervised high-intensity resistance and impact-loading exercise significantly increased lumbar spine bone mineral density while enhancing functional performance in postmenopausal women with low bone mass. Importantly, the intervention was shown to be both safe and efficacious when delivered under appropriate professional supervision. These findings support the incorporation of resistance and impact-loading exercise as fundamental components of osteoporosis prevention and musculoskeletal health promotion strategies in postmenopausal populations.

Mindfulness-based interventions have appeared as promising non-pharmacological approaches for menopausal symptom management. Several randomized controlled trials of mindfulness-based stress reduction (MBSR) programs have shown significant improvements in perceived stress, anxiety, sleep quality, and menopause-specific quality of life (86). These interventions appear to have limited effects on the frequency of vasomotor symptoms but are associated with reductions in symptom-related distress and enhanced psychological strength (86). These findings stress the importance of handling emotional, cognitive, and psychosocial dimensions of menopause, as well as its physical symptoms (86).

Table 3: Evidence base trials on lifestyle medicine and menopause

Author(s)	Trial	Intervention	Outcome(s)
Howard et al (92)	the Women's Health Initiative Dietary Modification Trial	Tested a low-fat diet	Weight loss and dietary interventions may help reduce vasomotor symptoms and improve menopausal symptom control.
Cohen et al (75) Newton et al (76)	MsFLASH research network	3×2 factorial: Aerobic exercise and yoga vs. usual activity, plus omega-3 supplementation vs. placebo capsule	Yoga, exercise, and omega-3 supplementation were not associated with significant improvements in vasomotor symptoms.
Ayres et al (78) Mann et al (77)	MENOS 1 and MENOS 2	cognitive behavioural therapy (CBT) in women experiencing bothersome vasomotor symptoms	Both studies showed sustained improvements in hot flush symptoms, insomnia, anxiety, and depression, supporting the long-term effectiveness of CBT-based interventions.
Simkin-Silverman et al (79)	the Women's Healthy Lifestyle Project	Lifestyle interventions including dietary counselling, exercise, and behavioural support during the menopausal transition	Healthy lifestyle behaviours may help reduce metabolic changes associated with menopause, including weight gain, central fat accumulation, and unfavourable lipid profile changes.
Cox et al (80)	The Sedentary Women Exercise Adherence Trial	structured aerobic exercise programs among midlife women	Exercise interventions improved cardiometabolic health, physical functioning, mental well-being, and quality of life, despite inconsistent effects on vasomotor symptoms.
van Gemert et al (81)	SHAPE-2 trial	compared exercise-induced weight loss with dietary-induced weight loss among postmenopausal women	Both dietary and exercise-induced weight loss improved body composition and metabolic health, although exercise provided greater preservation of lean mass and improved physical fitness
Taku et al (84)	Extracted or synthesized soybean isoflavones reduce menopausal hot flush frequency and severity; systematic review and meta-analysis of randomized controlled trials	Efficacy of extracted or synthesized soybean isoflavones in the alleviation of hot flushes in perimenopausal and postmenopausal women	Soy isoflavone supplements, derived by extraction or chemical synthesis, are significantly more effective than placebo in reducing the frequency and severity of hot flushes
Harding et al (85)	LIFTMOR trial	High-intensity resistance and impact exercise improved lumbar spine bone density and physical function in postmenopausal women with low bone mass.	The intervention was shown to be both safe and efficacious when delivered under appropriate professional supervision
Wong et al (86) Aliabadi et al (93)	randomized controlled trials of mindfulness-based stress reduction (MBSR) programs	This study aimed to assess the effectiveness of Mindfulness-Based Stress Reduction (MBSR) in alleviating menopause-related symptoms, compared with an active control condition, the Menopause Education Control (MEC)	MBSR show a greater reduction of psychological symptoms of depression and anxiety above active controls but do not reduce other somatic, urogenital and vasomotor symptoms.

A broad body of evidence from systematic reviews and meta-analyses supports the assimilation of lifestyle medicine into menopause care. Cochrane reviews of exercise interventions have shown improvements in physical functioning, cardiovascular fitness, and health-related quality of life. Meta-analyses of cognitive behavioural therapy show significant reductions in hot flush-related distress, insomnia severity, anxiety, and depressive symptoms. Reviews of Mediterranean diets have found favourable effects on cardiovascular risk profiles, inflammatory biomarkers, body composition, and general health outcomes. There is also emerging evidence that mindfulness-based interventions promote psychological wellbeing and improve sleep quality.

Key recommendations for clinical practice include routinely prioritizing lifestyle medicine as a core component of menopausal care; combining evidence-based lifestyle interventions with pharmacologic therapy when symptoms warrant; regularly evaluating cardiovascular, metabolic, skeletal, psychological, and quality of life outcomes; and individualizing care within a patient-centred model to optimize healthy aging and long-term function. This integrated strategy maximizes health benefits for menopausal women.

Conclusion

Menopause is a major physiological transition. It is characterized by a range of acute symptoms and chronic health consequences that may substantially affect quality of life and general health outcomes. Menopausal hormone therapy remains the most effective treatment for many menopausal symptoms, particularly vasomotor symptoms. However, lifestyle medicine affords a comprehensive, evidence-based approach to supporting health and wellbeing throughout the menopausal transition and beyond.

The six core pillars of lifestyle medicine are healthy nutrition, routine physical activity, refreshing sleep, effective stress management, avoidance of toxic substances, and positive social connections. These pillars address the complex biological, psychological, and social determinants that influence menopausal health. Emerging evidence indicates that these interventions can reduce the burden of vasomotor symptoms. They can also improve psychological well-being and sleep quality, preserve bone and musculoskeletal health, optimize body weight and metabolic function, reduce cardiovascular risk, and increase overall quality of life.

Women now spend a substantial proportion of their lives in the postmenopausal period. Integrating lifestyle medicine into routine menopause care is a sustainable and effective strategy for promoting healthy aging and sustained well-being. A multidisciplinary, patient-centred model combines evidence-based lifestyle interventions with appropriate medical therapies. This combination is likely to provide the most comprehensive and effective approach to menopause management.

Acknowledgment:
This review is dedicated to women undergoing the menopausal transition. Their experiences and fortitude continue to inform and advance research in women's health. This review intends to synthesize current, evidence-based knowledge on lifestyle interventions that support physical, psychological, and metabolic wellness during menopause. It integrates recent findings on nutrition, physical activity, stress management, and behavioural strategies. The goal is to provide clinically relevant insights to help optimize health results and quality of life during this important life stage.

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