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RESEARCH ARTICLE

LIFESTYLE INTERVENTIONS FOR PERIMENOPAUSAL SYMPTOMS: BEYOND HORMONE THERAPY A NARRATIVE REVIEW

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Abstract

Background: Perimenopause is a transitional phase characterized by hormonal fluctuations that give rise to vasomotor symptoms, sleep disturbances, mood changes, and metabolic alterations. While hormone therapy remains the most effective pharmacological treatment, many women either cannot use or prefer alternatives to hormonal approaches. This narrative review synthesizes current evidence on lifestyle intervent ions as non-pharmacological strategies for managing perimenopausal symptoms.

Methods: A comprehensive literature search was conducted in PubMe d, Cochrane Library, and Web of Science for systematic reviews, meta-analyses, and randomized controlled trials published between 2014 and 2025. Key search terms included perimenopause, menopause, lifestyle interventions, exercise, diet, cognitive behavioral therapy, mindfulness, yoga, and sleep hygiene.

Results: Evidence supports a multimodal lifestyle approach encompass ing physical activity, dietary modification, cognitive behavioral therapy (CBT), mind-body practices, and sleep hygiene. Structured exercise may improve vasomotor symptom severity, though its effect on frequency remains inconclusive. CBT demonstrates consistent efficacy in reducing the impact and bother of vasomotor symptoms, improving sleep, and alleviating depressive symptoms. Mediterranean dietary patterns are associated with reduced cardiometabolic risk and potentiall y lower symptom burden. Yoga and mindfulness-based interventions show promise for improving sleep quality, anxiety, and depressive symptoms. Acupuncture may serve as an adjunctive therapy for perimenopausal insomnia.

Conclusion: Lifestyle interventions offer a safe, evidence-informed, and patient-centered framework for managing perimenopausal symptoms. An integrative approach combining multiple lifestyle strategies, tailored to individual patient needs and preferences, can complement or serve as alternatives to pharmacological treatments. Further high-quality research is needed to optimize intervention protocols.

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Introduction:-

Perimenopause, defined as the transitional period preceding the final menstrual period, typically begins in the mid-40s and may span 4 to 10 years [3]. This phase is characterized by progressive ovarian follicular depletion and erratic fluctuations in estradiol and follicle-stimulating hormone (FSH), leading to menstrual irregularity and a constellation of symptoms that can substantially impair quality of life [4]. According to the Stages of Reproductive Aging Workshop (STRAW+10) criteria, the menopausal transition encompasses the early and late perimenopausal stages, during which women experience the most pronounced symptomatology [3].Vasomotor symptoms (VMS), including hot flashes and night sweats, are the hallmark manifestation of perimenopause, affecting approximately 80% of women during the transition [5]. Data from the Study of Women's Health Across the Nation (SWAN) revealed that the median duration of VMS is 7.4 years, with some women experiencing symptoms for over a decade [5]. Beyond VMS, perimenopausal women frequently report sleep disturbances, mood lability, anxiety, depressive symptoms, cognitive changes, musculoskeletal complaints, and genitourinary symptoms [4,7]. Furthermore, the hormonal and metabolic shifts during perimenopause increase the risk of cardiovascular disease, osteoporosis, and metabolic syndrome [38,39].

Menopausal hormone therapy (MHT) remains the gold standard for managing moderate-to-severe VMS and is endorsed by major professional societies [7]. However, MHT is contraindicated in women with a history of hormone-sensitive cancers, venous thromboembolism, and certain cardiovascular conditions [7]. Moreover, a significant proportion of women prefer non-hormonal and non-pharmacological approaches due to safety concerns, personal values, or cultural factors [6]. The 2023 nonhormone therapy position statement of The North American Menopause Society (NAMS) acknowledged the need for evidence-based non-hormonal options, including lifestyle modifications and psychobehavioral interventions [6].This narrative review aims to synthesize the current evidence on lifestyle interventions—including physical activity, dietary strategies, cognitive behavioral therapy, mind-body practices, sleep hygiene, and complementary therapies—for the management of perimenopausal symptoms. We evaluate the quality and consistency of available evidence and propose an integrative framework for clinical application.

Methods:-

This narrative review was conducted by searching PubMed, Cochrane Library, and Web of Science for English-language articles published between January 2014 and March 2026. Search terms included combinations of "perimenopause," "menopausal transition," "menopause," "lifestyle intervention," "exercise," "physical activity," "diet," "Mediterranean diet," "cognitive behavioral therapy," "mindfulness," "yoga," "acupuncture," "sleep," and "vasomotor symptoms." Priority was given to systematic reviews, meta-analyses, and randomized controlled trials. Reference lists of key articles were manually screened for additional relevant publications. Only studies with verifiable publication records in indexed journals were included.

Physical Activity and Exercise:-

Aerobic Exercise and Vasomotor Symptoms:-

The relationship between physical activity and vasomotor symptoms has been extensively studied with mixed but informative results. A systematic review and meta-analysis by Bailey et al. (2022), appraising 21 RCTs involving 2,884 participants, found that exercise significantly improved VMS severity compared to no-treatment controls (SMD = 0.25; 95% CI: 0.04–0.47; p = 0.02) [8]. However, no significant change in VMS frequency was observed (SMD = 0.14; 95% CI: −0.03 to 0.31; p = 0.12) [8]. These findings suggest that while exercise may reduce the perceived intensity of hot flashes, it does not necessarily decrease their occurrence.The earlier Cochrane review by Daley et al. (2014), which included five RCTs with 733 women, concluded that the evidence was insufficient to confirm exercise as an effective treatment for VMS, primarily due to methodological limitations and inconsistency across studies [9]. Notably, the MsFLASH trial, one of the few studies rated as low risk of bias, found no significant reduction in hot flashes or night sweats with a structured aerobic exercise intervention [10].

Despite these inconsistencies regarding direct VMS reduction, physical activity during perimenopause confers substantial benefits for cardiovascular risk reduction, weight management, bone mineral density preservation, and psychological well-being [1,2]. McNulty et al. (2025) conducted a systematic review of 25 RCTs and found that both exercise-only and combined interventions demonstrated potential benefits for perimenopausal symptom management, though between-study heterogeneity limited the strength of conclusions [2].

Mind-Body Exercise:-

Mind-body exercises, including yoga, tai chi, Pilates, and qigong, have gained increasing attention as complementary strategies for perimenopausal women. Zhang et al. (2024) conducted a meta-analysis of 11 RCTs comprising 1,005 participants and found that mind-body exercises significantly improved bone mineral density, sleep quality, anxiety, depression, and fatigue in perimenopausal and postmenopausal women compared to control groups [11].A comprehensive meta-analysis by Wang et al. (2025), encompassing 24 RCTs with 2,028 participants, demonstrated that yoga significantly improved menopausal symptoms overall, as well as sleep quality, anxiety, depressive symptoms, body mass index, and blood pressure [12]. These findings support yoga as a multifaceted intervention that addresses both the physical and psychological dimensions of perimenopause. Nevertheless, the 2023 NAMS nonhormone therapy position statement classified exercise and yoga as having limited or inconsistent evidence for VMS specifically [6], underscoring the distinction between VMS reduction and broader symptom management.

Cognitive Behavioral Therapy:-

Cognitive behavioral therapy has emerged as one of the most robustly supported non-pharmacological interventions for menopausal symptoms. The approach targets maladaptive cognitions and behaviors related to VMS, sleep, and mood, employing psychoeducation, cognitive restructuring, and behavioral strategies [15].

Evidence for CBT in Vasomotor Symptoms:-

Ye et al. (2022) conducted a meta-analysis of 14 RCTs involving 1,618 patients and found that cognitive and behavioral therapies significantly outperformed control conditions in reducing hot flashes (Hedges' $g = 0.39$; 95% CI: 0.23–0.55), night sweats, and depression ($g = 0.50$; 95% CI: 0.34–0.66) [13]. The MENOS program, developed by Hunter and colleagues, represents a landmark series of RCTs demonstrating the efficacy of group, self-help, and online CBT formats for VMS. In the MENOS4 trial, nurse-delivered group CBT achieved a 46% reduction in VMS problem ratings at 26 weeks, compared to 15% in usual care [16].Green et al. (2019) evaluated a comprehensive CBT protocol for menopausal symptoms (CBT-Meno) in a randomized controlled trial of 71 perimenopausal and postmenopausal women. The intervention demonstrated significantly greater improvements in VMS interference, depressive symptoms, sleep difficulties, and sexual concerns compared to waitlist control, with gains maintained at three-month follow-up [14].

CBT for Sleep and Mood:-

CBT for insomnia (CBT-I) has been specifically adapted for menopausal women with sleep disturbances. McCurry et al. (2016) demonstrated that telephone-based CBT-I significantly improved insomnia symptoms in perimenopausal and postmenopausal women with VMS in the MsFLASH trial [17]. Kalmbach et al. (2019) further showed that treating insomnia with CBT-I led to improvements in depression, maladaptive thinking, and hyperarousal in postmenopausal women [31]. The psychosocial meta-analysis by Park et al. (2024) confirmed that psychosocial interventions, particularly CBT, had small-to-medium effects on depression and quality of life in menopausal women [18].Taken together, CBT is recommended by both NAMS and the UK National Institute for Health and Care Excellence (NICE) as a first-line non-hormonal intervention for problematic menopausal VMS, and its applicability extends to sleep, mood, and overall quality of life [6,15].

Dietary Interventions:-

Mediterranean Diet:-

The Mediterranean diet, characterized by high intake of fruits, vegetables, legumes, whole grains, olive oil, and fish, has been investigated as a dietary framework for menopausal health. Gonçalves et al. (2024) conducted a systematic review of seven intervention studies and found that adherence to the Mediterranean diet was associated with reductions in weight, blood pressure, triglycerides, total cholesterol, and LDL levels in menopausal women [19]. Vetrani et al. (2022) reviewed the mechanistic pathways through which Mediterranean dietary components may modulate menopausal symptoms and chronic disease risk [20].An Australian cross-sectional study by Byrne-Kirk et al. (2024) assessed Mediterranean Diet adherence using the MEDAS tool and menopausal symptoms using the Menopause Rating Scale in 207 peri- and menopausal women aged 40–60. While overall adherence was not significantly associated with total symptom severity, low consumption of sugar-sweetened beverages was inversely associated with joint and muscle complaints [21]. These findings highlight the complexity of dietary–symptom relationships and suggest that specific dietary components, rather than global dietary patterns alone, may drive clinical benefits.

Plant-Based and Phytoestrogen-Rich Diets:-

Barnard et al. (2023) conducted a randomized controlled trial demonstrating that a low-fat, plant-based diet incorporating daily soy intake was associated with significant reductions in moderate-to-severe hot flash frequency among postmenopausal women [22]. Phytoestrogens, including isoflavones and lignans, may exert weak estrogenic effects through selective estrogen receptor binding, potentially modulating VMS [23]. Yelland et al. (2023) published a comprehensive narrative review on the role of diet in managing menopausal symptoms, concluding that while certain dietary patterns and components show promise, the evidence base remains heterogeneous and warrants further investigation through well-designed trials [23].Nutritional interventions have also been examined for their impact on the psychological dimensions of perimenopause. Grigolon et al. (2023) conducted a systematic review and meta-analysis of nutritional interventions for depressive and anxiety symptoms during the menopausal transition, finding modest but statistically significant benefits for reducing depressive symptom severity [35].

Mindfulness-Based Interventions and Stress Management:-

Mindfulness-based interventions (MBIs), including mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT), have gained a growing evidence base for menopausal symptom management. Liu et al. (2023) conducted a meta-analysis of 13 RCTs and found that MBIs significantly reduced anxiety, depression, and perceived stress in menopausal women [24]. Wang et al. (2025) further confirmed these benefits in a more recent systematic review, noting significant improvements in menopausal symptoms overall, though heterogeneity across studies limited the certainty of evidence [25].Gordon et al. (2021) demonstrated in an RCT that MBSR was effective in preventing perimenopausal depressive symptoms, with effects moderated by baseline estradiol levels and psychosocial factors [27]. Portella et al. (2021) conducted an RCT of meditation in working women undergoing the menopausal transition and found significant improvements in menopausal symptoms and insomnia [26].

The biopsychosocial model of menopause posits that symptom experience is shaped not only by hormonal changes but also by cognitive appraisals, coping strategies, social context, and cultural meanings [15]. Mindfulness practices directly target the cognitive and emotional components of symptom distress, promoting acceptance, non-reactivity, and emotional regulation. This theoretical alignment supports the integration of mindfulness into multimodal management strategies for perimenopause [24,30].

Sleep Hygiene and Insomnia Management:-

Sleep disturbances are among the most prevalent and debilitating symptoms of perimenopause, affecting up to 60% of women during the menopausal transition [4]. Insomnia during perimenopause arises from a complex interplay of hormonal fluctuations, nocturnal VMS, age-related changes in sleep architecture, and psychosocial stressors [7].

CBT-I, incorporating sleep restriction, stimulus control, cognitive restructuring, and sleep hygiene education, is recommended as the first-line treatment for chronic insomnia by the American Academy of Sleep Medicine [31]. McCurry et al. (2016) demonstrated the efficacy of telephone-delivered CBT-I specifically in perimenopausal and postmenopausal women experiencing VMS-associated sleep disruption [17]. Sleep hygiene measures—including maintaining consistent sleep-wake schedules, optimizing the sleep environment, limiting caffeine and alcohol, and managing nocturnal temperature—serve as foundational behavioral strategies [31].Acupuncture has emerged as a complementary approach for perimenopausal insomnia. A systematic review and meta-analysis by Zhao et al. (2025) analyzed 28 RCTs and found that six high-quality sham-controlled studies showed acupuncture significantly improved Pittsburgh Sleep Quality Index scores, total sleep time, and sleep efficiency, with effects maintained at four-week follow-up [28]. Song et al. (2025) further confirmed these findings in a meta-analysis of nine RCTs involving 968 women [29]. While promising, the predominance of studies from single-country settings and variability in acupuncture protocols warrant cautious interpretation and further multicenter research.

Table 1. Summary of Key Systematic Reviews and Meta-Analyses on Lifestyle Interventions for Perimenopausal/Menopausal Symptoms

Author (Year)	Study Type	Intervention	Studies (N)	Key Findings
Bailey et al. (2022) [8]	SR & MA	Exercise vs. control	21 RCTs (2,884)	Exercise improved VMS severity (SMD=0.25; 95% CI: 0.04–0.47). No significant effect on VMS frequency.
McNulty et al. (2025) [2]	SR	Exercise, diet, health education	25 RCTs	Exercise and health education showed potential benefits. No diet-only studies found.
Ye et al. (2022) [13]	SR & MA	CBT/behavior therapy	14 RCTs (1,618)	CBT reduced hot flashes (g=0.39), night sweats, and depression (g=0.50) vs. control.
Wang et al. (2025) [12]	SR & MA	Yoga	24 RCTs (2,028)	Yoga improved menopausal symptoms, sleep, anxiety, depression, BMI, and blood pressure.
Zhang et al. (2024) [11]	SR & MA	Mind-body exercise	11 RCTs (1,005)	Improved BMD, sleep quality, anxiety, depression, and fatigue.
Liu et al. (2023) [24]	SR & MA	Mindfulness (MBI)	13 RCTs	MBIs reduced anxiety, depression, and perceived stress in menopausal women.
Gonçalves et al. (2024) [19]	SR	Mediterranean diet	7 studies	Reduced weight, BP, triglycerides, cholesterol, and LDL in menopausal women.
Zhao et al. (2025) [28]	SR & MA	Acupuncture (insomnia)	28 RCTs	Improved PSQI, total sleep time, sleep efficiency vs. sham. Maintained at 4-week follow-up.
Park et al. (2024) [18]	SR & MA	Psychosocial interventions	30 studies (3,501)	Small-to-medium effects on depression and QoL. CBT and MBI significant.
Daley et al. (2014) [9]	Cochrane	Exercise for VMS	5 RCTs (733)	Insufficient evidence for exercise as VMS treatment. Low quality evidence.

SR, systematic review; MA, meta-analysis; RCT, randomized controlled trial; VMS, vasomotor symptoms; SMD, standardized mean difference; CI, confidence interval; BMD, bone mineral density; CBT, cognitive behavioral therapy; MBI, mindfulness-based intervention; QoL, quality of life; PSQI, Pittsburgh Sleep Quality Index; BP, blood pressure.

Table 2. Summary of Evidence and Clinical Recommendations by Intervention Type

Intervention	Target Symptoms	Level of Evidence	Recommendation	Clinical Considerations
Aerobic Exercise	VMS severity, mood, CV risk, weight	Moderate (severity) Low (frequency)	Recommended as adjunctive therapy	150 min/week moderate-intensity. Direct VMS reduction inconsistent but overall health benefits well-established.
Yoga / Mind-Body	Sleep, anxiety, depression, BMD, fatigue	Moderate	Recommended as complementary approach	Multiple benefits across symptom domains. NAMS rates VMS evidence as limited.
CBT (for VMS)	VMS bother, sleep, depression	High	Strongly recommended (NAMS/NICE)	Most robust evidence. Effective in group, self-help, online formats. Brief (4–6 sessions).
CBT-I (insomnia)	Insomnia, sleep quality, nocturnal VMS	High	First-line for chronic insomnia (AASM)	Gold standard for insomnia. Telephone-delivered effective. Improves comorbid depression.
Mediterranean / Plant-Based Diet	Cardiometabolic risk, weight, VMS (emerging)	Low–Moderate	Recommended for overall health	Strong for cardiometabolic outcomes. VMS-specific evidence emerging. Soy may help.
Mindfulness (MBSR/MBCT)	Anxiety, depression, stress, VMS distress	Moderate	Recommended for psychological symptoms	Targets cognitive/emotional distress. 8–12 week programs. May prevent depression.
Acupuncture	Insomnia, sleep quality	Moderate (insomnia) Low (VMS)	May be considered as adjunct for insomnia	Promising for insomnia. Most evidence from single-country studies.

VMS, vasomotor symptoms; CBT, cognitive behavioral therapy; CBT-I, CBT for insomnia; NAMS, North American Menopause Society; NICE, National Institute for Health and Care Excellence; AASM, American Academy of Sleep Medicine; MBSR, mindfulness-based stress reduction; MBCT, mindfulness-based cognitive therapy; BMD, bone mineral density; CV, cardiovascular.

Toward an Integrative Lifestyle Framework:-

The evidence reviewed in this article supports a multimodal, patient-centered approach to perimenopausal symptom management that aligns with the principles of lifestyle medicine. Anekwe et al. (2025) proposed a comprehensive lifestyle medicine framework for menopausal health organized around six pillars: healthy eating, physical activity, mental well-being, avoidance of risky substances, restorative sleep, and healthy relationships [1]. This framework emphasizes that lifestyle interventions are not merely adjuncts to pharmacotherapy but foundational strategies that can be tailored to individual needs, preferences, and clinical circumstances.In clinical practice, an integrative lifestyle approach might involve: (a) prescribing structured physical activity combining aerobic and mind-body exercises; (b) recommending a Mediterranean or plant-rich dietary pattern with attention to phytoestrogen intake; (c) offering CBT or CBT-informed self-help for VMS, mood, and sleep disturbances; (d) incorporating mindfulness or meditation practices for stress management and emotional regulation; and (e) implementing sleep hygiene protocols as a foundational intervention. For women with specific needs or preferences, acupuncture may be considered as a complementary modality, particularly for insomnia [28,29].Importantly, the choice of interventions should be guided by shared decision-making, cultural sensitivity, and the recognition that perimenopause is not merely a hormonal event but a biopsychosocial transition that intersects with aging, life stage, social roles, and personal values [1,15]. This perspective is particularly relevant in Southeast Asian settings, where traditional medicine and integrative approaches are culturally embedded in healthcare-seeking behavior.

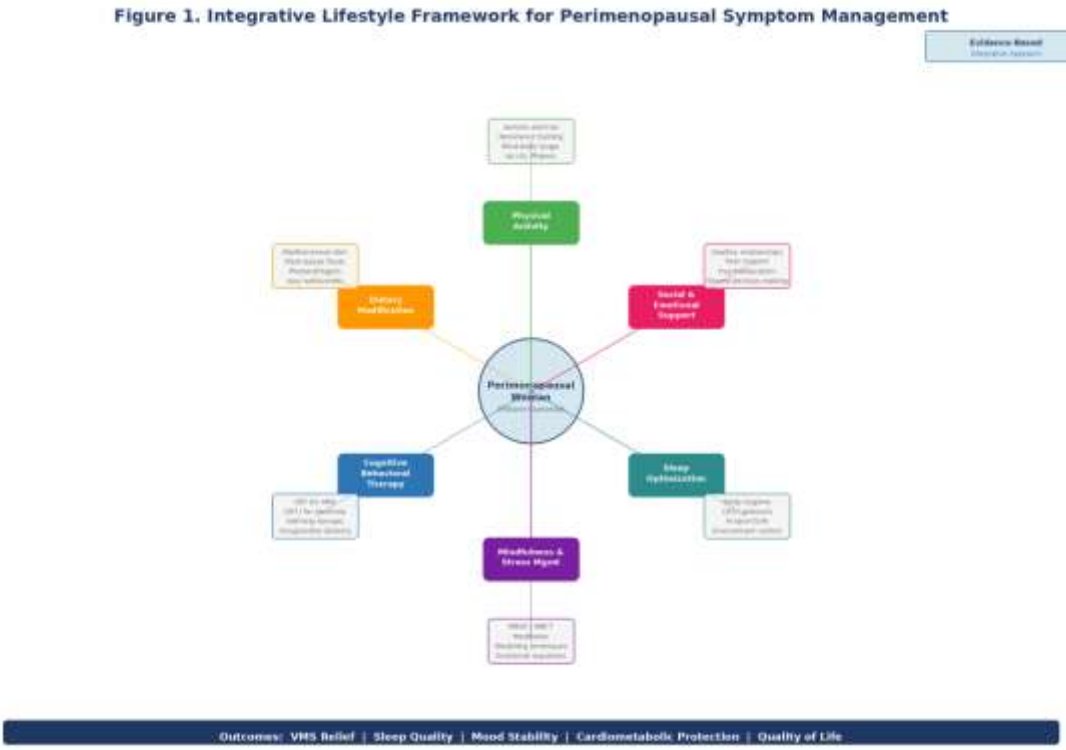

Figure 1. Integrative Lifestyle Framework for Perimenopausal Symptom Management.

The framework centers on a patient-centered approach with six interconnected pillars: physical activity, dietary modification, cognitive behavioral therapy, mindfulness and stress management, sleep optimization, and social/emotional support.

Limitations and Future Directions:-

Several limitations of the current evidence base merit acknowledgment. First, many studies combine perimenopausal and postmenopausal women without stratifying results by menopausal stage, limiting the specificity of findings for the perimenopause specifically [2]. Second, the heterogeneity of intervention protocols, outcome measures, and study durations across trials complicates the synthesis of evidence and the development of standardized recommendations [8,11]. Third, most RCTs of lifestyle interventions have relatively short follow-up periods, leaving

questions about the long-term sustainability and durability of treatment effects unanswered.Notably, the systematic review by McNulty et al. (2025) highlighted that no studies have exclusively examined diet-based interventions for perimenopausal symptoms, representing a critical research gap [2]. Future research should prioritize: (a) trials that stratify participants by STRAW+10 staging to isolate perimenopausal-specific effects; (b) head-to-head comparisons of different lifestyle modalities; (c) long-term follow-up studies examining sustained benefits and adherence; (d) culturally adapted interventions for diverse populations; and (e) mechanistic studies elucidating the pathways through which lifestyle interventions modulate menopausal physiology.

Conclusion:-

Lifestyle interventions represent a safe, accessible, and evidence-informed approach to managing the multifaceted symptoms of perimenopause. While no single lifestyle strategy is a panacea, the convergent evidence supports a multimodal approach integrating physical activity, dietary modification, cognitive behavioral therapy, mind-body practices, and sleep optimization. CBT stands out as the most consistently supported non-pharmacological intervention for VMS-related distress, while exercise, yoga, and dietary strategies offer broader health benefits that extend beyond symptom management to cardiometabolic protection and psychological resilience.For women who cannot or prefer not to use hormone therapy, lifestyle interventions provide meaningful alternatives that honor patient autonomy and align with a whole-person model of care. Clinicians should engage in shared decision-making, assess individual symptom profiles and preferences, and construct personalized lifestyle prescriptions that empower women to navigate the perimenopausal transition with resilience and vitality.

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