



## Systematic Review

# Unveiling the Potential of CoQ10 in Hypertension Management: A Systematic Review of Clinical Trials

Mohammad Faisal Hossain\*

Appalachian College of Pharmacy, Oakwood, VA 24631, USA

\*Correspondence should be addressed to M. F. Hossain, Ph.D., Assistant Professor, Department of Pharmaceutical Sciences, Appalachian College of Pharmacy, Oakwood, Virginia, USA. E-mail: mhossain@acp.edu

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## ABSTRACT

Hypertension is a very common health issue that has significant risks. Globally, it affects an estimated 1.28 billion adults. Hypertension is the leading cause of early mortality in the world as around 46% of all cases are left untreated. Recent clinical trials have evaluated the potential of Coenzyme Q10 in its ability to reduce blood pressure levels. The goal of this article is to conduct a comprehensive review of coenzyme Q10's efficacy in managing hypertension through a systematic review of clinical trials. Thirteen relevant studies were sourced from PubMed to be examined. The findings suggested that coenzyme Q10 may have some benefits in lowering blood pressure levels. However, the findings do not support CoQ10 as an effective alternative treatment for hypertension. Future studies are needed to determine if coenzyme Q10 could serve as an alternative to standard maintenance therapy for hypertensive patients.

**Keywords:** Coenzyme Q10 (CoQ10), Hypertension, Dietary Supplement, Systematic Review, Clinical Trials

## Introduction

Hypertension is defined as elevated blood pressure levels. It is a very common health condition that requires attention due to the complications that can arise if left untreated. Approximately 1.28 billion adults aged 30 to 79 globally have hypertension. Hypertension is one of the leading causes of early mortality in the world. 46% of individuals living with hypertension are unaware of their condition. Only 42% receive a diagnosis and treatment by a physician. To add, statistics reveal that only one in five individuals with hypertension have their blood pressure under control [1]. Controlling blood pressure in hypertensive patients often requires

prescription medication but poor adherence is commonly attributed to poor clinical outcome [2]. This explains the urgent need for effective interventions to manage this health issue.

CoQ10 is produced in the mitochondrial inner membrane and is a vital compound in the human body [3]. It is an important component involved in cellular energy production [4] and is known for its desirable effect which makes it an appealing supplement for many patients with different disease conditions. It is one of the most widely used dietary supplements [5]. It has also been shown to be effective in anti-inflammatory and antioxidant effects [6]. On top of that, some studies show that it could

be effective in lowering blood pressure. Research indicates that reduced plasma coenzyme Q10 concentrations are found in individuals with hypertension [7]. Also, coenzyme Q10 supplementation is believed to have blood pressure-lowering effects through the decrease in peripheral resistance [8].

Effectively managing hypertension involves a comprehensive approach that combines lifestyle modifications, medication, and dietary interventions. Foods such as Animal organ meats, such as liver and kidney, fish (salmon, tuna,) olive oil, nuts, fruits, and vegetables [9] in your diet can naturally boost your coenzyme Q10 levels. Meta-analyses incorporating multiple clinical trials have suggested that Coenzyme Q10 could help reduce systolic blood pressure by up to 17 mm Hg and diastolic blood pressure by up to 10 mm Hg in hypertensive patients, with minimal side effects reported [10]. However several trials have reported no significant blood pressure reduction of the CoQ-treated participants. This review aims to evaluate the potential benefits of Coenzyme Q10 in hypertension management, offering insight for individuals striving to enhance their cardiovascular health through lifestyle adjustments and diet modifications.

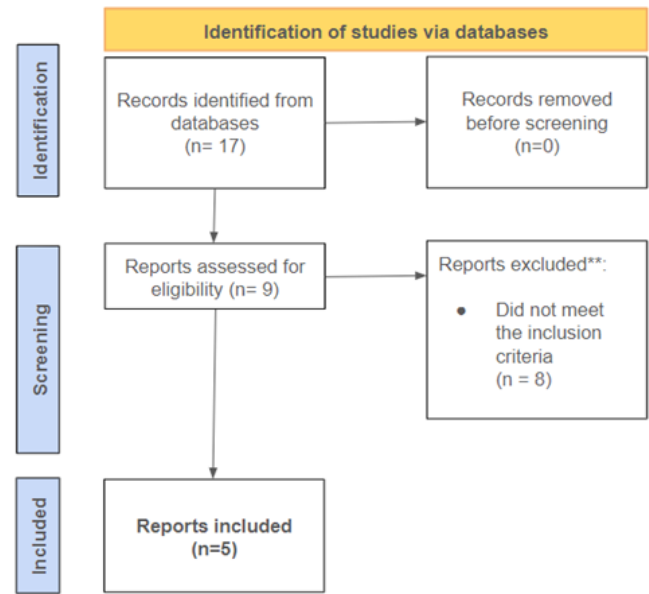
## Method

The systematic review was conducted using the online database PubMed, using the keywords Coenzyme Q10 (CoQ10) and hypertension. The inclusion criteria involved clinical trials and articles published between 2000 and 2024. Exclusion criteria were set to exclude studies involving conditions other than hypertension. Finally, 9 articles were included in the review due to their relevance to CoQ10 and hypertension (Fig. 1).

## Results and Discussion

Effect of Coenzyme Q10 Supplementation on SBP and DBP in Patients with Hypertension is presented in Table 1.

In this systematic review article, a total of 17 studies were identified from PubMed. Among these studies,



**Figure 1:** Flow Chart of Study Selection

five trials are explained in Table 1. To add, out of the five studies reviewed, two indicated no clinically significant reduction in systolic or diastolic blood pressure. However, three trials showed improvement in reducing systolic blood pressure. Next, one additional clinical trial not included in the table focused on 85 patients receiving 200 mg of coenzyme Q10 for an eight-week duration. This study revealed no independent effect on blood pressure [16]. Various studies explored coenzyme Q10 in combination with other compounds demonstrating positive effects in decreasing pro-inflammatory factors like IL-6, and increasing adiponectin levels (vasodilation) [17]. This comprehensive analysis suggests that coenzyme Q10, especially when combined with other compounds, may play a beneficial role in reducing blood pressure [18, 19]. The evidence from these trials suggests a positive trend for low-dose (30 mg to 60 mg) coenzyme Q10 supplementation in improving blood pressure levels. Future investigations with larger sample sizes and different doses are warranted to examine the precise mechanisms of action and the overall efficacy of CoQ10 dietary supplements.

**Table 1:** Effect of CoQ10 Supplementation in Patients with Hypertension

Study/Year	Daily Dose	Participants /Duration	Outcomes
Sangouni, Abbas Ali et al. 2022 [11]	60 mg	22, 12 weeks	⊖ SBP: $-1.0 \pm 9.7$ ( $p=0.42$ ) & DBP: $-0.9 \pm 8.3$ ( $p=0.51$ ) “No significant differences were seen between the four groups”
Cicero, Arrigo F G et al. 2022 [12]	30 mg	20, 4 weeks	✓ “Significantly improved mean arterial pressure ( $-2.2 \pm 1.1$ mmHg vs. $0.2 \pm 0.7$ mmHg, $p < 0.05$ vs. placebo)”
Mazza, Alberto et al. 2018 [13]	30 mg	104, 2 months	✓ “A greater reduction of systolic BP ( $-5.2$ vs. $-3.0$ mmHg), diastolic BP ( $-4.9$ vs. $2.9$ mmHg)”
Young, Joanna M et al. 2012 [14]	200 mg	30, 12 weeks	⊖ “Does not result in clinically significant reductions in systolic or diastolic 24-h ambulatory BP... although there was a significant reduction in daytime diastolic BP loads”
Burke, B E et al. 2001 [15]	60 mg	83, 12 weeks	✓ “The mean reduction in systolic blood pressure of the CoQ-treated group was $17.8 \pm 7.3$ mm Hg ”

\*SBP: Systolic blood pressure; DBP: Diastolic blood pressure.

## Conclusion

Regular blood pressure monitoring is key for effective condition management. It is important to understand that dietary supplements are not FDA-approved for treating any medical conditions. Dietary supplements are intended to complement a person's diet and provide nutrients that may be missing or insufficient in their diet. They are not meant to treat or prevent any diseases. While some studies suggest that CoQ10 supplementation may contribute to blood pressure reduction, it is important to understand that it should be used as an adjunctive and not replace prescribed medications and medical guidance. Individuals with hypertension should talk with their healthcare providers to see if CoQ10 supplementation is appropriate for their treatment plan.

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## Conflict of interest

The authors declare no conflict of interest.

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