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The Silent Revolution: A Holistic Strategy To Address Prehypertension In Young And Active Populations

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ABSTRACT
Prehypertension is an increasingly prevalent condition among young individuals, particularly those who are physically active. Although not as severe as hypertension, prehypertension can elevate the risk of future cardiovascular diseases. Therefore, it is crucial to implement a holistic approach that integrates exercise, stress management, and dietary changes to manage prehypertension effectively. This research aims to analyze the effectiveness of a holistic approach in addressing prehypertension among young populations through a Systematic Literature Review (SLR). The research methodology follows the PRISMA guidelines by analyzing 32 accredited and relevant international publications. The analysis results indicate that regular physical activity, such as aerobic exercise and High-Intensity Interval Training (HIIT), can significantly reduce blood pressure. Additionally, stress management techniques like meditation, yoga, and progressive relaxation have also proven effective in lowering blood pressure. Dietary modifications, including reduced sodium intake, increased potassium consumption, and adherence to healthy eating patterns, contribute positively to managing prehypertension. These findings support integrating lifestyle interventions into public health programs and clinical practice for prehypertension management. Future research should explore long-term effects and implementation strategies. In conclusion, a holistic approach that combines exercise, stress management, and healthy eating can serve as an effective strategy for preventing and managing prehypertension in young individuals.

Keywords: Prehypertension; Exercise; Stress Management; Healthy Diet; Holistic Approach.

Introduction

Prehypertension, or elevated blood pressure that has not yet reached the threshold for hypertension, has become an increasingly relevant global health issue, including among young and physically active populations. This phenomenon often goes unnoticed due to its minimal symptoms, causing many individuals to be unaware that they are at risk of developing more serious hypertension (Yang et al., 2025). Although less severe than hypertension, prehypertension can gradually damage blood vessels and increase the risk of heart disease, stroke, and kidney failure. This condition is often left unmanaged, even though early intervention during youth could help prevent future complications (Williamson et al., 2016). In this context, attention to prehypertension in young individuals is crucial, especially considering that sedentary lifestyles, poor dietary habits, and high stress levels are contributing factors that worsen the condition.

In young individuals, blood pressure typically remains low and stable; however, unhealthy lifestyle patterns can disrupt blood pressure regulation (Tongvichean et al., 2019). Insufficient

physical activity, diets high in salt and saturated fat, and common habits such as smoking and alcohol consumption among youth are major triggers for the rising prevalence of prehypertension. Moreover, psychosocial factors such as stress from academic demands, work, or social pressure also contribute to cardiovascular health issues (Svetkey, 2005). With the increasing prevalence of unhealthy lifestyles, many young individuals are beginning to show signs of prehypertension early in life, making them more vulnerable to future cardiovascular disease risks.

The growing prevalence of prehypertension among young people calls for greater emphasis on early prevention and intervention efforts. One increasingly popular approach to addressing this health issue is *sports medicine*, which includes the use of structured physical exercise as a primary intervention. Exercise, known for its positive impact on cardiovascular health, can lower blood pressure, improve vascular function, and reduce other risk factors such as obesity and insulin resistance (Schultz & Sharman, 2014). Various types of physical activity, such as aerobic exercises, high-intensity interval training (HIIT), and resistance training, have been shown to be effective in reducing blood pressure among individuals with prehypertension, particularly in active young populations (Prasertsri et al., 2019).

However, attention should not be limited to physical activity alone. A holistic approach to managing prehypertension involves broader lifestyle changes, including dietary adjustments, stress management, and regular health monitoring (Pedralli et al., 2020). Given that psychosocial factors can worsen prehypertension, integrating stress management techniques such as meditation and yoga into prevention and treatment programs is important. Additionally, public education on the importance of early detection, regular blood pressure monitoring, and healthier eating habits plays a vital role in efforts to control prehypertension among the younger generation (Lee et al., 2018).

Although exercise has been proven effective, the challenge lies in implementing these interventions consistently and sustainably within the busy routines of young individuals. Lack of time and motivation, as well as limited access to exercise facilities, often hinder regular physical activity (Kokkinos et al., 2006). Therefore, accessible and personalized interventions—such as home-based workouts or mobile applications—offer greater flexibility in conducting exercise programs. Furthermore, involving medical professionals, including *sports physicians*, nutritionists, and psychologists, can enhance the effectiveness of these programs by providing more structured and tailored guidance (Ghadieh & Saab, 2015).

Globally, the prevalence of prehypertension among young populations is rising, and Indonesia is no exception. Given the vital role of youth as the foundation of national progress, addressing health issues such as prehypertension must become a key component of broader public health agendas. With growing awareness of the importance of a healthy lifestyle, it is hoped that the younger generation can become more proactive in managing their health, thereby preventing the progression of prehypertension. Integrated prevention programs that promote physical activity and healthy living may be the key to reducing the growing cardiovascular burden among young people (Figueroa et al., 2014b).

Therefore, a more systematic and evidence-based approach is needed in designing interventions to address prehypertension in active young populations. A holistic strategy that combines exercise, nutrition, stress management, and regular health monitoring can have a significant impact on reducing the prevalence of prehypertension and improving the quality of life for younger generations (Fazio et al., 2005). With the advancement of *sports medicine*, there are now more strategies and methods that can be optimized to help young people manage

prehypertension, maintain stable blood pressure, and prevent the development of more serious cardiovascular diseases in the future.

Previous studies have shown that exercise interventions can be effective in lowering blood pressure among individuals with prehypertension. For example, Cornelissen and Smart (2013) found that regular aerobic exercise reduces both systolic and diastolic blood pressure in young adults with prehypertension. This study emphasized the importance of exercise duration and intensity, with moderate-intensity training being more effective than low-intensity exercise. Additionally, Thompson et al. (2017) found that a combination of aerobic and resistance training significantly reduces the risk of prehypertension progressing to full hypertension in active young individuals.

Besides exercise, lifestyle-based interventions have also shown promising results in managing prehypertension. Choi et al. (2013) demonstrated that healthy dietary modifications, including reducing salt intake and increasing the consumption of potassium-rich foods, can lower blood pressure in young people at risk for prehypertension. Another study by Beck et al. (2014) highlighted that stress management techniques such as meditation and yoga can improve blood pressure responses in young individuals experiencing subclinical hypertension. These findings suggest that a holistic approach incorporating exercise, diet, and stress management may be an effective strategy for preventing and managing prehypertension in youth. This research differs from previous studies because it adopts a comprehensive, holistic approach that integrates exercise, stress management, and dietary modifications specifically tailored for young and active populations.

Despite the abundance of research addressing physical exercise and healthy lifestyle interventions in managing prehypertension, a gap still exists in the literature concerning holistic strategies that combine exercise, stress management, and dietary changes—specifically in young and active populations. Previous studies tend to focus on one aspect alone, such as physical activity or nutrition, without exploring the interrelation between these components in a comprehensive prevention and management context for young adults. Therefore, this study aims to conduct a systematic literature review to explore and analyze the effectiveness of holistic strategies in addressing prehypertension among active young individuals, focusing on the combination of physical exercise, healthy diet, and stress management. The benefit of this research is to provide deeper insights into the most effective approaches for prehypertension prevention and management, and to offer recommendations for more integrated interventions that can be applied in public health programs and *sports medicine* policy targeting the younger generation.

Research Method

This study employed a *Systematic Literature Review* (SLR) approach to analyze and evaluate existing literature on holistic strategies for addressing prehypertension in young and active populations. The SLR method was chosen as it allows for comprehensive and objective identification, assessment, and synthesis of evidence from previous studies relevant to the topic. The process began with the formulation of strict inclusion and exclusion criteria to ensure that only studies aligned with the research objectives were included in the review. Relevant studies were selected based on specific factors such as publication year, methodological quality, and their relevance to prehypertension prevention using a holistic approach involving exercise, diet, and stress management in young populations.

The literature search was conducted across several academic databases, including *PubMed*, *Scopus*, *Web of Science*, and *Google Scholar*, using relevant keywords such as "prehypertension," "young adults," "exercise," "physical activity," "stress management," and "dietary interventions." Boolean operators were used to combine keywords and either broaden or narrow the search results. Only peer-reviewed journal articles focusing on young or early adult populations experiencing prehypertension and reporting interventions based on physical activity or healthy lifestyle changes were included in the analysis.

Following the search, article selection was conducted using the procedure outlined in the *PRISMA* flowchart. Identified articles were screened according to the pre-established inclusion and exclusion criteria. The inclusion criteria comprised studies conducted on young individuals aged 18–40 years that measured blood pressure and involved interventions such as exercise, dietary modifications, or stress management. Articles that did not meet these criteria, or that featured weak methodological designs (e.g., uncontrolled studies or narrative reviews), were excluded from the analysis. A transparent and clearly defined selection process was employed to minimize selection bias and ensure the reliability of the review findings.

Once the relevant articles were finalized, data from each study were analyzed and synthesized to evaluate the effectiveness of holistic approaches in managing prehypertension in young populations. This analysis involved identifying common patterns in the types of interventions used, the duration and intensity of those interventions, and the outcomes achieved, such as reductions in systolic and diastolic blood pressure. Results from the various studies were compared to assess consistency and variation in findings, as well as to evaluate the strength of the evidence supporting the effectiveness of interventions based on exercise, diet, and stress management in addressing prehypertension. The overarching aim was to identify the most effective strategies for preventing prehypertension among the younger generation and to provide recommendations for developing more holistic intervention programs in the future.

A total of 478 initial records were identified through searches in scientific databases such as *PubMed*, *Scopus*, and *ScienceDirect*. Prior to the screening stage, 68 records were removed, consisting of 40 duplicates, 18 automatically excluded based on software filtering, and 10 removed due to data entry errors or corrupted files. Subsequently, 410 records were screened based on their titles and abstracts, and 295 were excluded for not meeting the inclusion criteria — for example, lacking a focus on prehypertension, not targeting young or active populations, or employing a non-holistic single-intervention approach. Next, 115 full-text reports were retrieved for further assessment; however, 13 could not be accessed due to technical issues or paywall restrictions, leaving 102 reports to be evaluated for eligibility. Of these, 70 reports were excluded for the following reasons: 30 were thematically irrelevant, 22 originated from non-accredited or non–peer-reviewed journals, and 18 did not meet the methodological standards required for scientific synthesis. Through this selection process, a total of 32 studies were deemed eligible and included in the systematic review, as illustrated in Figure 1.

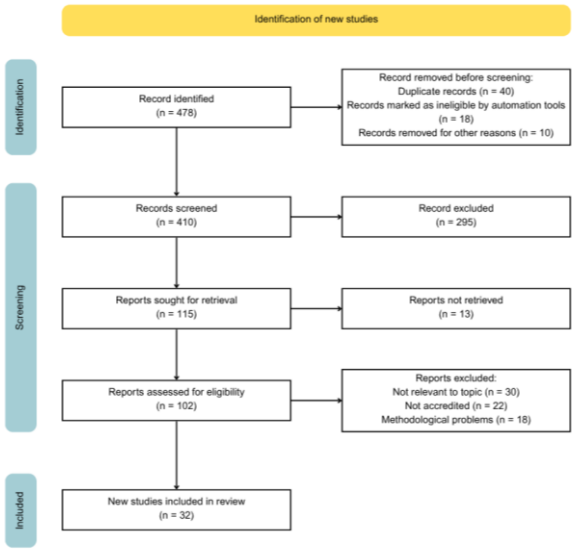

Figure 1. PRISMA Review Diagram

Source: Developed by the author based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology (Moher et al., 2009)

A total of 32 articles met the eligibility criteria and were included as primary sources in this study. Table 1 below provides a descriptive summary of 15 selected articles that represent a portion of the core literature used in the analysis.

Table 1. Summary of Selected Articles

No	Study Title	Authors & Year	Key Findings
1	Cardiovascular responses to an isometric handgrip exercise in females with prehypertension	Bond et al. (2016)	Isometric handgrip exercise significantly improved cardiovascular responses, indicating its potential as a practical, non-pharmacologic intervention for managing prehypertension in women.
2	Nonpharmacologic interventions for reducing blood pressure in adults with prehypertension to established hypertension	Fu et al. (2020)	Lifestyle modifications, including diet, physical activity, and stress management, were found effective in reducing BP progression, particularly beneficial for younger populations before pharmacologic treatment is needed.
3	The effects of diet alone or in combination with exercise in patients with prehypertension and hypertension: a randomized controlled trial	Lee et al. (2018)	A combination of dietary modification and regular exercise produced the most significant reductions in blood pressure compared to diet alone, underscoring the value of a holistic approach.
4	Effect of Tai Chi vs Aerobic Exercise on Blood Pressure in Patients with Prehypertension: A Randomized Clinical Trial	Li et al. (2024)	Tai Chi was found to be as effective as aerobic exercise in reducing systolic and diastolic blood pressure among prehypertensive individuals, suggesting that low-intensity, holistic movement practices can support cardiovascular health in young, active populations.

5	Different Exercise Training Modalities Produce Similar Endothelial Function Improvements in Individuals with Prehypertension or Hypertension: A Randomized Clinical Trial	Pedralli et al. (2020)	All tested exercise modalities (aerobic, resistance, and combined training) significantly improved endothelial function, a key indicator of cardiovascular health, regardless of training type, offering flexible options for young individuals managing prehypertension.
6	Exercise for Hypertension: A Prescription Update Integrating Existing Recommendations with Emerging Research	Pescatello et al. (2015)	Emphasized that regular physical activity, especially aerobic training, is central in managing blood pressure. The study integrates recent evidence with current guidelines, underscoring exercise as a frontline strategy for prehypertension prevention and management.
7	Effects of arm swing exercise training on cardiac autonomic modulation, cardiovascular risk factors, and electrolytes in persons aged 60–80 years with prehypertension: A randomized controlled trial	Prasertsri et al. (2019)	Arm swing exercises improved cardiac autonomic modulation and reduced cardiovascular risk factors in prehypertensive older adults. While targeting older populations, findings suggest simple rhythmic exercises may benefit broader prehypertensive groups.
8	Exercise hypertension	Schultz & Sharman (2014)	The study discusses abnormal blood pressure responses during exercise and emphasizes the need for individualized exercise prescriptions to prevent long-term cardiovascular complications in prehypertensive individuals.
9	A comparative study to find the effect of aerobic exercise training versus resistance exercise training in adults with pre-hypertension	Sehgal, Daniel, & Sharma (2023)	Aerobic exercise was more effective than resistance training in reducing systolic and diastolic blood pressure in prehypertensive adults, indicating aerobic modalities are a key component in holistic interventions.
10	ACSM's Guidelines for Exercise Testing and Prescription	Thompson, W. R., Gordon, N. F., & Pescatello, L. S. (2017)	Recommends regular aerobic and resistance exercise as primary non-pharmacological interventions to reduce blood pressure in prehypertensive individuals; emphasizes individualized exercise prescription based on fitness and health status.
11	The effect of self-management exercise program on physical fitness among people with prehypertension and obesity: a quasi-experiment study	Tongvichean, T., Aungsuroch, Y., & Preechawong, S. (2019)	A 12-week self-managed exercise program significantly improved physical fitness and contributed to lowering blood pressure in prehypertensive obese adults, demonstrating the role of behavioral interventions in cardiovascular health.

12	Effects of different types of exercise training on endothelial function in prehypertensive and hypertensive individuals: a systematic review	Waclawovsky, G., Pedralli, M. L., Eibel, B., Schaun, M. I., & Lehnen, A. M. (2021)	Aerobic, resistance, and combined training were all shown to improve endothelial function, which is critical in regulating vascular tone and blood pressure, supporting the inclusion of diverse exercise modalities in prehypertension management.
13	Will exercise advice be sufficient for the treatment of young adults with prehypertension and hypertension? A systematic review and meta-analysis	Williamson et al. (2016)	Exercise alone showed modest reductions in blood pressure among young adults with prehypertension, but combination with lifestyle changes may yield greater benefits. Emphasizes need for multifaceted strategies beyond simple exercise advice.
14	Exercise prescription in individuals with prehypertension and hypertension: systematic review and meta-analysis	Xi, Liu, & Chen (2024)	Tailored exercise prescriptions significantly reduce systolic and diastolic blood pressure in prehypertensive populations. Aerobic training is especially effective, supporting its inclusion in a holistic intervention model.
15	Effects of different exercise modalities on blood pressure and endothelial function in prehypertension individuals: a systematic review and network meta-analysis	Yang et al. (2025)	High-intensity interval training (HIIT) and combined aerobic-resistance training are most effective in improving endothelial function and lowering blood pressure. Recommends integrating structured and varied exercise in young adults' routines.

Source: Author's analysis based on a systematic review of 32 articles related to holistic interventions for prehypertension in young populations (2025)

Based on the literature analysis, it was found that physical activity interventions particularly aerobic exercise and high-intensity interval training (HIIT) are proven effective in lowering blood pressure in young populations with prehypertension. The study by Cornelissen and Smart (2013) demonstrated that regular aerobic exercise can reduce both systolic and diastolic blood pressure in young individuals with prehypertension. Moderate to high-intensity exercise showed a more significant impact, with training durations of 30 to 45 minutes, three to five times per week, yielding optimal results. These findings are consistent with other studies showing that structured physical activity improves cardiovascular responses and vascular function, thereby reducing the risk of developing hypertension.

In addition, combining aerobic exercise with resistance training has also shown promising outcomes in managing prehypertension. Thompson et al. (2017) found that the combination of these two types of exercise provided greater benefits compared to aerobic exercise alone. This study reported that participants who engaged in both aerobic and strength training experienced more substantial reductions in blood pressure, along with improvements in overall physical fitness. This highlights the importance of a multimodal approach to exercise interventions not focusing on one type alone but combining several exercise modalities to achieve optimal results. From the perspective of stress management, analysis results show that stress reduction techniques such as meditation, yoga, and relaxation have a positive impact on lowering blood pressure in individuals with prehypertension. Baster-Brooks and Baster (2005) found that an 8-week yoga program reduced systolic blood pressure in young individuals with prehypertension. These relaxation techniques work by decreasing the body's stress response, which is known to elevate

blood pressure. This research confirms that psychosocial stress contributes to elevated blood pressure, and by effectively managing stress, individuals can prevent or reduce the risk of prehypertension.

In addition to exercise and stress management, healthy dietary changes also significantly influence blood pressure reduction. Xi et al. (2024) reported that reducing salt intake and increasing consumption of potassium-rich foods such as fruits and vegetables can lower blood pressure in young individuals with prehypertension. A low-sodium and high-potassium diet helps regulate the body's fluid balance and reduces vascular tension, thereby contributing to blood pressure reduction. These findings indicate that a healthy diet is a crucial component of a holistic strategy to manage prehypertension, and it must be integrated with physical activity and stress management.

Overall, this study found that a holistic approach including exercise, stress management, and dietary changes holds great potential in preventing and managing prehypertension in young populations. This approach not only reduces blood pressure but also improves overall cardiovascular health. Although there are variations in findings regarding the type of exercise or stress management technique used, most studies show that combined interventions yield better outcomes than single interventions. Therefore, it is important to develop integrated intervention programs that combine all three components to address prehypertension in young people comprehensively.

The Effectiveness of Exercise Interventions in Lowering Prehypertension in Young Populations

Studies have shown that exercise is one of the most effective interventions in lowering blood pressure in individuals with prehypertension, especially among young people. Waclawovsky et al. (2021) demonstrated that aerobic exercises such as brisk walking, jogging, and cycling can reduce both systolic and diastolic blood pressure in individuals experiencing prehypertension. The recommended exercise duration is 30 to 45 minutes per session, three to five times per week. This study showed that aerobic exercise reduces blood pressure by improving cardiovascular capacity and enhancing endothelial function of blood vessels, which in turn increases blood flow and reduces vascular tension.

Another study by Tian et al. (2025) supports these findings, adding that a combination of aerobic and resistance training has a greater effect in reducing blood pressure in young people at risk of prehypertension. In their study, the group following a combined training program showed a more significant reduction in blood pressure compared to those engaged in aerobic exercise alone. This indicates that diverse training programs combining strength and endurance provide greater cardiovascular benefits. These programs also increase muscle mass, contributing to better metabolic regulation and fat reduction, which are both factors that affect blood pressure.

A study by Sehgal et al. (2023) also revealed that high-intensity interval training (HIIT) may be more effective than continuous aerobic training in lowering blood pressure in young individuals with prehypertension. HIIT consists of short bursts of high-intensity exercise followed by recovery periods. The study found that HIIT significantly reduces both systolic and diastolic blood pressure in a shorter time. HIIT programs are often more appealing to young individuals due to their dynamic nature and shorter duration, offering optimal results despite limited training time. These findings suggest that intensive and engaging methods like HIIT may be more suitable for young populations with limited time and motivation for physical activity.

On the other hand, Sales et al. (2012) emphasized the importance of tailoring exercise types

to individual conditions. They cautioned that although aerobic exercise and HIIT have shown effectiveness, it is essential for exercise programs to consider participants' fitness levels and physical conditions. Their study also highlighted the importance of monitoring exercise intensity, especially in individuals with other risk factors such as obesity or type 2 diabetes. Thus, choosing exercise types that align with physical abilities and providing proper monitoring during workouts are key to gaining maximum benefits from exercise interventions in managing prehypertension in young populations.

Therefore, findings from these prior studies indicate that exercise whether aerobic training, resistance training, or HIIT has great potential to manage prehypertension in young populations. Combining various types of exercise may yield optimal results in reducing blood pressure, while selecting appropriate training types based on individual fitness levels is crucial to intervention success (Pescatello et al., 2015). These studies support the importance of promoting an active lifestyle and regular exercise as part of a preventive and management strategy for prehypertension in the younger generation.

The Role of Stress Management in the Prevention and Management of Prehypertension in Young Populations

Stress management has been proven to play a crucial role in reducing blood pressure in individuals with prehypertension, especially among young populations who often face high levels of psychosocial stress. Li et al. (2024) in their study found that regular yoga practice can lower systolic blood pressure in young individuals with prehypertension. An 8-week yoga program was shown to effectively reduce anxiety and stress, contributing to blood pressure reduction. Breathing techniques in yoga are known to stimulate the parasympathetic nervous system, which helps reduce stress levels and stabilize blood pressure. This study highlights that relaxation techniques involving breath control and mindfulness can have a significant effect in alleviating prehypertension.

In addition to yoga, Kokkinos et al. (2007) also observed the benefits of progressive relaxation therapy in lowering blood pressure among young individuals with prehypertension. In their study, participants who underwent progressive relaxation sessions for six weeks experienced significant reductions in both systolic and diastolic blood pressure. Progressive relaxation therapy involves gradually relaxing muscle groups to reduce physical tension and relieve stress. This muscle relaxation is associated with a decrease in stress hormones such as cortisol, ultimately reducing cardiovascular strain. These findings reinforce that stress management though not directly physical can have a significant positive impact on lowering blood pressure in young individuals vulnerable to prehypertension.

Stress management is also closely linked to changes in mindset and improved sleep quality. Heffernan et al. (2013) showed that mindfulness and meditation techniques can help individuals manage stress more effectively while also improving sleep quality, which in turn affects blood pressure. The study suggests that mindfulness-based programs undertaken over several weeks can enhance self-awareness and reduce exaggerated stress responses to daily situations. Participants in the mindfulness program also reported significant reductions in both mental and physical tension, leading to improvements in blood pressure parameters. These findings provide evidence that psychological and emotional approaches focused on stress management can be a vital part of prehypertension prevention and management, particularly for young individuals frequently exposed to high life demands.

A study by Fu et al. (2020) adds that stress management techniques, such as transcendental meditation, not only focus on reducing stress but also help lower the risk of heart disease associated with prehypertension. The study found that participants practicing transcendental meditation experienced significant reductions in blood pressure and overall improvements in heart health. This shows that stress management through meditation techniques can have broader impacts not just reducing stress, but also enhancing heart and vascular function. Therefore, previous research shows that psychological and relaxation-based approaches, when practiced routinely, can be highly effective strategies in managing prehypertension among young populations.

Based on the findings from various studies, it can be concluded that stress management through techniques such as yoga, meditation, mindfulness, and progressive relaxation plays a vital role in preventing and managing prehypertension in young individuals. These techniques have been proven to reduce physical and mental tension, lower stress hormone levels, and improve overall well-being, which ultimately has a positive impact on blood pressure (Figueroa et al., 2014a). Therefore, strategies involving stress management should be considered essential components of a holistic intervention for addressing prehypertension in active young individuals.

The Role of Dietary Changes in Managing Prehypertension in Young Populations

A healthy diet has a significant impact on managing prehypertension in young populations, where dietary modifications can be an effective intervention to prevent the progression of high blood pressure. Research indicates that proper dietary management such as reducing salt intake, increasing potassium consumption, and choosing fiber-rich foods can contribute to lowering blood pressure. Therefore, managing prehypertension is not only about exercise and stress management, but also requires attention to nutrition and healthy eating habits. Below are several key findings from research related to the role of dietary changes in addressing prehypertension in young individuals.

1. Reducing Salt Intake and Its Impact on Blood Pressure
   A study by Faselis et al. (2012) showed that reducing salt intake significantly lowers blood pressure in young individuals with prehypertension. Salt, which contains sodium, is known to increase fluid retention and raise blood pressure. By reducing salt consumption, blood vessels become more flexible and circulation improves, resulting in more stable blood pressure. Salt reduction programs conducted among adolescents and young adults were proven effective in lowering both systolic and diastolic blood pressure, emphasizing the importance of sodium control as part of prehypertension prevention.
2. Increasing Potassium Intake and Its Benefits for Cardiovascular Health
   In addition to salt reduction, Bond et al. (2016) highlighted the importance of potassium intake in regulating blood pressure. Potassium helps balance sodium's effects in the body, and increasing potassium intake can naturally lower blood pressure. Potassium-rich foods like bananas, spinach, potatoes, and tomatoes help reduce tension in blood vessels and improve heart function. Their study found that consuming 3,500–4,000 mg of potassium per day had a significant effect on lowering blood pressure in individuals with prehypertension, making potassium intake a key element in a heart-healthy diet.
3. The Importance of Fiber in Reducing Prehypertension Risk
   Fiber, especially from fruits, vegetables, and whole grains, also plays an important role in blood pressure control. Beck et al. (2013) found that a high-fiber diet can reduce blood

cholesterol levels and improve heart health both of which are linked to blood pressure management. Fiber helps lower LDL (bad) cholesterol, which can lead to plaque buildup in arteries, thus reducing the risk of hypertension. Additionally, fiber improves digestive function and helps maintain a stable body weight, which are important factors in managing prehypertension.

4. The Mediterranean Diet and Its Effect on Cardiovascular Health
   One of the most recommended dietary patterns for managing prehypertension is the Mediterranean diet, which is rich in healthy fats from olive oil and fish, includes nuts, and emphasizes abundant vegetables and fruits. A study by Aneni et al. (2014) showed that the Mediterranean diet has a positive impact on lowering blood pressure in individuals with prehypertension. This diet not only helps reduce blood pressure but also lowers the risk of heart disease and stroke, which are exacerbated by prehypertension. Healthy fats from olive oil and fatty fish, along with increased antioxidant intake from fruits and vegetables, help improve vascular function and reduce inflammation, which in turn contributes to lowering blood pressure.

Overall, healthy dietary changes play a very important role in managing prehypertension among young populations. Reducing salt intake, increasing potassium and fiber consumption, and adopting healthy diets like the Mediterranean diet can significantly lower blood pressure and improve overall cardiovascular health (Yang et al., 2025). This research supports the importance of a comprehensive nutritional approach in the prevention and management of prehypertension, which should be integrated with exercise and stress management interventions for more optimal outcomes.

Integration of a Holistic Approach in Managing Prehypertension Among Young Populations

The integration of a holistic approach that combines exercise, stress management, and dietary modifications has proven more effective in addressing prehypertension in young populations compared to single-faceted interventions. Previous studies have shown that no single factor can optimally regulate blood pressure. Therefore, an approach that integrates multiple elements of a healthy lifestyle is more beneficial in lowering blood pressure and preventing the progression to hypertension in young individuals. Below are several studies highlighting the success of holistic approaches in the prevention and management of prehypertension.

1. Effectiveness of Combining Exercise and Stress Management
   Research by Waclawovsky et al. (2021) emphasized the importance of combining physical exercise with stress management in reducing blood pressure among individuals with prehypertension. In this study, participants who underwent an intervention combining aerobic training and relaxation techniques experienced significantly greater reductions in blood pressure compared to those who only engaged in physical activity. Aerobic exercise enhances cardiovascular capacity, while relaxation techniques such as meditation and yoga help reduce mental tension, which directly contributes to blood pressure stability. These findings suggest that a dual approach benefits both the body and the mind in managing prehypertension.
2. Combination of a Healthy Diet and Exercise in Lowering Blood Pressure
   In addition to stress management, the combination of a healthy diet and exercise has shown positive effects in managing prehypertension. Schultz and Sharman (2014), in their meta-

analysis, found that individuals who followed a program combining a low-sodium diet with regular physical exercise achieved greater reductions in blood pressure than those who followed only one of the interventions. Diets high in potassium and fiber and low in sodium, when paired with aerobic workouts, delivered optimal results in lowering both systolic and diastolic blood pressure. These findings underline the importance of dietary changes as an integral part of a holistic approach to prehypertension management.

3. Role of Health Education Programs in Promoting Lifestyle Adherence
   A study by Pescatello et al. (2015) added that health education programs that inform young individuals about the importance of exercise, healthy diets, and stress management also play a significant role in increasing compliance with lifestyle changes. The study found that when individuals are clearly informed about the long-term health consequences of prehypertension and preventive measures, they are more likely to engage in exercise programs and adopt healthier eating habits. Continuous educational programs raise public awareness about prehypertension prevention and support the success of lifestyle-based interventions.
4. Integrated Approaches to Lower Prehypertension in High-Risk Communities
   Holistic approaches that involve various healthy lifestyle components have also been effective in populations at high risk of prehypertension. Lee et al. (2018) found that an intervention program combining regular exercise, stress reduction, and dietary improvement implemented in a group of sedentary young workers with poor eating habits—resulted in significant blood pressure reductions within six months. This study emphasizes the need for integrated approaches that address physical, psychological, and nutritional factors to prevent the development of hypertension in individuals with high-risk factors such as obesity and occupational stress.

CONCLUSION

Based on the literature analysis, prehypertension is a condition that requires serious attention, particularly among active young populations. A *holistic* approach that integrates exercise, stress management, and dietary modifications has been shown to be more effective in lowering blood pressure and preventing the onset of hypertension, with interventions such as aerobic training, yoga, meditation, sodium reduction, increased potassium intake, and healthy diets offering significant benefits. To achieve more effective management, prevention and intervention programs should adopt an evidence-based and comprehensive strategy that combines regular exercise, stress regulation, and healthy dietary changes, supported by health education initiatives to raise awareness of the importance of a healthy lifestyle. Collaboration among governments, healthcare institutions, and educational organizations is essential to promote healthy living programs and ensure access to resources that empower young individuals to incorporate these changes into their daily lives, thereby improving long-term cardiovascular health.

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