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Medicinal Plants Used in Iranian Traditional Medicine for Enhancing Children's Heart Health: A Brief Review

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ABSTRACT

Children's cardiovascular health is significantly shaped by proper nutrition and a balanced lifestyle. Diets abundant in fruits, vegetables, whole grains, and healthy fats, combined with the avoidance of processed foods and refined sugars, are vital in maintaining vascular integrity and optimal cardiac function. In this context, certain medicinal plants—due to their potent antioxidant and anti-inflammatory properties—may offer additional cardioprotective benefits. This review aims to explore medicinal plants documented in Iranian traditional medicine that have been associated with promoting heart health in children. This brief review draws upon a comprehensive search of major scientific databases, including PubMed, Scopus, Web of Science, Google Scholar, and SID, alongside an analysis of classical Iranian and Islamic medical texts related to pediatric cardiology. Relevant literature published between 2000 and 2024 was identified using targeted keywords and evaluated for inclusion. Findings suggest that Iranian traditional medicine emphasizes the use of natural substances to support cardiovascular health in children. A variety of fruits—such as apples, grapes, pears, kiwis, watermelon, pomegranates, dates, barberries—and vegetables like carrots and lentils, are highlighted for their antioxidant properties and heart-supportive compounds. Additionally, whole grains (e.g., oats) and nuts (e.g., almonds, walnuts, pistachios) are recognized for their beneficial fatty acids. Medicinal plants such as borage, lemongrass, olive, and pumpkin are also traditionally recommended for their anti-inflammatory effects, vascular-strengthening properties, and nutritional value. Medicinal plants rooted in Iranian traditional practices may offer meaningful contributions to the prevention of heart disease in children. Their rich composition of antioxidant and anti-inflammatory agents underpins their potential to support heart function and mitigate early cardiovascular risk factors.

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Introduction

Cardiovascular health in adulthood is established from childhood. The etiology of most heart disease remains largely undetermined, likely involving a complex interplay between genetic susceptibility and environmental factors (Zolfi et al., 2024). Research indicates that the development and progression of certain cardiovascular diseases begin in childhood and adolescence (Gidding et al., 1995). This process is influenced by both genetic and environmental factors (Steinberger et al., 2016). Risk factors for heart disease in children include high blood pressure, high cholesterol, obesity, diabetes, smoking, and physical inactivity (Jackson et al., 2015). Promoting healthy habits, such as consuming a balanced diet, avoiding tobacco, managing stress, and increasing physical activity, is crucial for preventing heart disease (Jackson et al., 2015). Regular screenings to detect early risk factors are essential, and these measures should be continuously applied to children and adolescents (Harrell et al., 1998).

Monitoring heart health in children, even in the absence of congenital heart disease, is vital. Routine check-ups and regular consultations with specialists can ensure heart health in the future. The primary goal is to reduce risk factors from an early age, ensuring a healthy life free from cardiovascular diseases (Wei et al., 2015). These factors can be controlled through lifestyle choices, including a proper diet and regular physical activity (Moller et al., 1994). Preventive measures at this stage can delay the onset of heart disease. Managing these factors from childhood can contribute to the prevention of heart disease later in life (Claydon et al., 2015).

Traditional medicine and herbal remedies have gained interest as complementary and alternative approaches in alleviating symptoms and improve children's health (Zolfi and Radvar, 2024). Herbal remedies, formulated in modern pharmaceutical forms, can serve as a viable alternative to synthetic drugs, offering improved acceptance and ease of use for children (Zolfi and Pirhadi, 2025). In traditional medicine, dietary regimens for maintaining children's heart health emphasize the use of fruits and vegetables rich in antioxidants, healthy fats like olive and sesame oil, and herbs such as ginger and cinnamon. These diets help strengthen the heart and prevent cardiovascular issues (Shaheen et al., 2017; Jiménez-Balam et al., 2019). The use of medicinal plants to enhance children's general health has received attention in many cultures as a natural and effective method (Shaheen et al., 2017). Medicinal plants, due to

their calming, anti-inflammatory, and immune-boosting properties, can significantly contribute to children's health (Jiménez-Balam et al., 2019). Some plants are rich in antioxidants, which play a role in preventing diseases and strengthening the cardiovascular system (Geissler et al., 2002). Proper and supervised use of these plants can help improve general health and effectively prevent many diseases (Sofowora et al., 2013). Medicinal plants play a vital role in maintaining and improving children's heart health. Some plants, due to their anti-inflammatory and vasodilatory effects, can enhance heart function and improve blood circulation (Sofowora et al., 2013). Additionally, some medicinal plants, due to their strong antioxidants, help prevent oxidative damage and protect children's cardiovascular health (Sofowora et al., 2013). Correct use of these plants as part of a healthy diet can be effective in preventing cardiovascular diseases in childhood. The aim of this review study is solely to provide a report on the medicinal plants used in traditional Iranian medicine and their impact on children's heart health

Methodology

This review study was conducted using reliable scientific resources, traditional medicine texts, and published articles from reputable databases such as PubMed, Scopus, Web of Science, Google Scholar, and SID. The search was carried out using relevant keywords, including "Traditional Medicine," "Pediatric Cardiology," "Herbal Medicine," "Cardiovascular Health in Children," and their Persian equivalents. Studies published between 2000 and 2024 were reviewed. Additionally, authoritative Iranian and Islamic traditional medicine texts related to children's heart health were analyzed in this study.

Results

The findings indicate that traditional medicine, utilizing fruits, vegetables, and medicinal plants, can play an effective role in maintaining heart health in children. The consumption of substances such as apples, grapes, pomegranates, kiwis, dates, oats, almonds, walnuts, pistachios, borage, and lemon verbena, due to their antioxidant, anti-inflammatory, and vascular-strengthening properties, plays a significant role in the prevention of cardiovascular diseases in children. Medicinal plants, fruits, and vegetables beneficial for heart health are listed in Table 1.

Table 1: Medicinal plants and their cardiovascular benefits in Iranian traditional medicine

Common name	Farsi name	Scientific name	Plant family	Used Part	Ecological classification	Mechanisms	References
Apple	Sib	<i>Malus domestica</i>	Rosaceae	Fruit	Perennial	Antioxidant, blood lipid regulation, inflammation reduction	Patocka et al., 2020
Grape	Angour	<i>Vitis vinifera</i>	Vitaceae	Fruit	Perennial	Vascular strengthening, cardiovascular health improvement	Alsallameh et al., 2022
Pear	Golabi	<i>Pyrus communis</i>	Rosaceae	Fruit	Perennial	Cholesterol reduction, improved vascular function	Ibrahim et al., 2020
Oat	Joedosar	<i>Avena sativa</i>	Poaceae	Seed	Annual	Cholesterol reduction, blood pressure improvement	Singh et al., 2013
Kiwi	Kiwi	<i>Actinidia deliciosa</i>	Actinidiaceae	Fruit	Perennial	Antioxidant, cardiovascular system strengthening	Hussain et al., 2021
Watermelon	Hendavaneh	<i>Citrullus lanatus</i>	Cucurbitaceae	Fruit	Annual	Blood circulation improvement, blood pressure reduction	Ozcan et al., 2023
Pistachio	Pesteh	<i>Pistacia vera</i>	Anacardiaceae	Seed	Perennial	LDL reduction, HDL increase, inflammation reduction	Kashaninejad et al., 2011
Pumpkin	Kadohalvaei	<i>Cucurbita pepo</i>	Cucurbitaceae	Fruit, Seed	Annual	Heart strengthening, anti-inflammatory, blood pressure reduction	Rolnik et al., 2022
Olive	Zeytoun	<i>Olea europaea</i>	Oleaceae	Fruit, Leaf	Perennial	Antioxidant, inflammation and blood pressure reduction	Suroowan et al., 2021
Lentil	Adas	<i>Lens culinaris</i>	Fabaceae	Seed	Annual	Blood sugar regulation, cholesterol reduction	Lim et al., 2012
Date	Khorma	<i>Phoenix dactylifera</i>	Arecaceae	Fruit	Perennial	Antioxidant, oxidative stress reduction	Coşkun et al., 2022
Barberry	Zereshk	<i>Berberis vulgaris</i>	Berberidaceae	Fruit, Root	Perennial	Anti-inflammatory, blood lipid reduction	Brahmi et al., 2024
Borage	Gavzaban	<i>Echium amoenum</i>	Boraginaceae	Flower, Leaf	Annual	Sedative, blood pressure reduction, heart strengthening	Noras et al., 2022
Lemon verbena	Behlimou	<i>Aloysia citrodora</i>	Verbenaceae	Leaf	Perennial	Sedative, vascular strengthening	Shafiee et al., 2016
Pomegranate	Anar	<i>Punica granatum</i>	Lythraceae	Fruit, Peel	Perennial	Antioxidant, inflammation reduction, heart strengthening	Al-Muammar et al., 2012
Wild Almond	Badam	<i>Prunus amygdalus</i>	Rosaceae	Seed Kernel	Perennial	Anti-inflammatory, blood pressure reduction, blood sugar regulation, antioxidant	Sahib, 2014
Walnut	Gerdou	<i>Juglans regia</i>	Juglandaceae	Seed Kernel	Perennial	Rich in beneficial fatty acids, anti-inflammatory	Thakur and Singh, 2013

The plant families Rosaceae (which includes plants such as apples, grapes, and pears) and Cucurbitaceae (which includes watermelon and pumpkin) are prominently featured in most of the studied plants and are known for their heart-strengthening and anti-inflammatory properties. The families Vitaceae and Anacardiaceae also provide plants that are particularly effective in reducing blood lipids and improving circulation.

Among the various plant parts investigated, fruits were the most commonly used. These fruits typically possess antioxidant and anti-inflammatory properties and have a significant impact on improving cardiovascular function. Seeds and leaves were also utilized in different contexts and have notable properties in reducing blood pressure, regulating blood sugar, and strengthening the cardiovascular system. Flowers and roots also play their role in reducing inflammation and strengthening the heart.

Among the most important mechanisms cited for most of the medicinal plants are antioxidant properties, inflammation reduction, blood lipid lowering, and blood sugar regulation. These attributes play a crucial role in the prevention and treatment of heart diseases. In particular, the antioxidant properties of these plants help prevent oxidative damage to heart and vascular cells. Strengthening the vessels and improving cardiovascular health are other notable mechanisms observed in certain medicinal plants. The reduction of cholesterol and improvement of vessel function are other important features found in plants like pears and apples.

Discussion

In traditional medicine, apples are recognized as antioxidants that aid in regulating blood lipids and reducing inflammation. Their active compounds include flavonoids and pectin (Patocka et al., 2020). Grapes are used for vascular strengthening and maintaining cardiovascular health. Resveratrol and anthocyanins are key compounds found in this fruit (Alsallameh et al., 2022). Pears are traditionally used to reduce cholesterol and improve vascular function, with flavonoids and polyphenols playing a significant role in these effects (Ibrahim et al., 2020). Barley helps in reducing cholesterol and improving blood pressure. Beta-glucan and antioxidants are the active constituents in this plant (Singh et al., 2013). Kiwi is known for enhancing cardiovascular health and reducing oxidative

stress. Vitamin C and flavonoids are its active compounds (Hussain et al., 2021). Watermelon aids in improving circulation and reducing blood pressure, with citrulline and lycopene contributing to these effects (Ozcan et al., 2023). Pistachios help reduce LDL, increase HDL, and decrease inflammation, with fatty acids and antioxidants being the active compounds (Kashaninejad et al., 2011). Pumpkin has heart-strengthening and anti-inflammatory effects, with omega-3 fatty acids and vitamins contributing to these benefits (Rolnik et al., 2022). Olive oil is a potent antioxidant that reduces inflammation and blood pressure. Oleuropein and polyphenols are the most active compounds in it (Suroowan et al., 2021). Lentils assist in regulating blood sugar and reducing cholesterol, with proteins and polyphenols contributing to these effects (Lim et al., 2012). Dates are known for their antioxidant properties, reducing oxidative stress, and containing vitamins and polyphenols (Coşkun et al., 2022). Barberry exhibits anti-inflammatory properties and reduces blood lipids. Alkaloids and phenolic compounds are responsible for these effects (Brahmi et al., 2024). Borage is a sedative and reduces blood pressure, with fatty acids and antioxidants playing a role in these effects (Noras et al., 2022). Lemon balm is calming and strengthens the vascular system, with essential oils and flavonoids being the active compounds (Shafiee et al., 2016). Pomegranate is an antioxidant that reduces inflammation and strengthens the heart, with tannins and anthocyanins as key components (Al-Muammar et al., 2012). Sweet almonds are anti-inflammatory and reduce blood pressure, with unsaturated fatty acids and proteins contributing to these effects (Sahib, 2014). Walnuts are a rich source of omega-3 fatty acids and possess anti-inflammatory properties, strengthening the cardiovascular system through these compounds (Thakur and Singh, 2013). Bioactive compounds found in medicinal plants contribute to heart health by reducing inflammation, improving blood circulation, and lowering LDL cholesterol levels. These compounds can enhance heart function and reduce the risk of cardiovascular diseases (Thakur and Singh, 2013).

Conclusion

Based on these findings, it can be concluded that medicinal plants, through various mechanisms such as antioxidant activity, inflammation reduction, blood lipid regulation, and

cardiovascular strengthening, are valuable tools in traditional Iranian medicine for improving the cardiovascular health of children. The use of fruits, seeds, and leaves as primary plant-based resources in the treatment and prevention of cardiovascular diseases, especially in children, is of great importance

Declarations

Conflict of interest

The authors have no competing interests to declare that are relevant to the content of this article.

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Consent to participate

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Author contributions

AZ: Conceptualization, the original draft writing, investigation, writing including reviewing and editing and investigation and formal analysis; AZ: Supervision, and project administration; AZ: Conceptualization, the original draft writing, writing including reviewing and editing.

Ethical considerations

This study was performed in line with the principles of the Declaration of Helsinki.

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