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Medicinal Plants Effective in Treating Hemophilia in Children: A Review Study

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ABSTRACT

Hemophilia is an inherited bleeding disorder resulting from deficiencies in clotting factors. Traditional and complementary therapies—including herbal medicine, hypnosis, and acupuncture—have been reported in some studies to reduce bleeding episodes and enhance clotting efficiency. This mini-review aims to identify medicinal plants traditionally employed in the management of hemophilia in children. Scientific literature published between 2000 and 2025 was systematically reviewed using reputable databases. Articles focusing on the treatment of pediatric hemophilia using medicinal plants or natural supplements were selected. Inclusion criteria required relevance to hemophilia management in children, while studies published in languages other than Persian or English, or those lacking pertinent data, were excluded. Several medicinal plants were identified for their traditional use in managing hemophilia, including *Ginkgo biloba*, *Allium sativum*, *Zingiber officinale*, *Panax* spp., *Aesculus hippocastanum*, *Curcuma longa*, *Salix alba*, *Rosmarinus officinalis*, *Daucus carota*, *Thymus vulgaris*, *Satureja hortensis*, *Vitis vinifera*, *Aloe vera*, *Matricaria chamomilla*, *Berberis vulgaris*, and *Salvia officinalis*. Medicinal plants with anti-inflammatory and anti-hemorrhagic properties may offer therapeutic benefits in the supportive management of hemophilia in children by enhancing clotting function and reducing internal bleeding. Nonetheless, rigorous clinical trials are necessary to validate their efficacy and ensure safety in pediatric populations.

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Introduction

Hemophilia is an inherited bleeding disorder characterized by impaired blood clotting. This condition arises due to deficiencies in clotting factors, specifically factor VIII or IX (Franchini and Mannucci, 2014). Individuals with hemophilia experience prolonged bleeding following injuries, and internal bleeding, particularly in joints, is common. Hemophilia is classified into two primary types: Hemophilia A and Hemophilia B (Zimmerman and Valentino, 2013). It is the most common hereditary bleeding disorder (Soucie et al., 2014). Although both males and females may carry or exhibit symptoms of hemophilia, the condition predominantly affects males, while

females are often carriers, capable of passing the gene to their sons (White et al., 2001). Interestingly, approximately 30% of hemophilia cases occur without a family history, resulting from spontaneous genetic mutations (Rodriguez-Merchan, 1996). Symptoms include abnormal bleeding, extensive bruising, and internal hemorrhaging (Shapiro et al., 2001).

Pediatric hemophilia refers to a hereditary disorder in which children exhibit reduced levels of clotting proteins, leading to an inability to form blood clots and consequent severe bleeding episodes (Santagostino and Fasulo, 2013). Children with hemophilia face constant risks of severe hemorrhages, internal bleeding, and joint inflammation (Castaman and Matino, 2019).

The two most common types of hemophilia are Hemophilia A and Hemophilia B. Hemophilia A results from a deficiency in factor VIII, while Hemophilia B stems from a lack of factor IX. Both are hereditary and are transmitted via the X chromosome (Bunschoten et al., 1998). Women, having two X chromosomes, have a 50% chance of passing the defective gene to their offspring if they carry the gene (Bernardi et al., 2009). Men with the defective gene can only transmit it to their daughters but not their sons (Mannucci, 2003).

Bleeding episodes, a hallmark of hemophilia, manifest in various forms, including abnormal bleeding from the nose, gums, or minor injuries; joint hemorrhages in major joints such as the knees and elbows; and internal bleeding in muscles and the brain (Coppola et al., 2010). Cerebral hemorrhage, in particular, poses a life-threatening complication (Young, 2012, Azhar et al., 2021).

Although there is no definitive cure for hemophilia, several treatment approaches are available to manage the condition (Rodriguez-Merchan and Corte-Rodriguez, 2020). Replacement therapy, involving the administration of factor VIII concentrates for Hemophilia A and factor IX concentrates for Hemophilia B, is commonly used. These concentrates are derived from human blood or produced through genetic engineering (Kundu et al., 2018). However, such treatments may have adverse effects, including allergic reactions, gastrointestinal issues, or kidney damage (Wang et al., 2015). Gene therapy is under investigation but lacks long-term safety data (Lazare, 2020). Anti-hemophilic chemical drugs, including recombinant clotting factors, plasma-derived products, and non-factor therapies such as emicizumab, play a crucial role in managing bleeding episodes in hemophilia patients. However, their use may be associated with adverse effects, including allergic reactions, the development of inhibitor antibodies, an increased risk of thrombosis, and potential hepatic or renal complications. Careful selection of the appropriate treatment and continuous patient monitoring are essential to minimize these risks and optimize therapeutic outcomes (Mauser-Bunschoten, 1995). Preliminary studies suggest that traditional and complementary therapies, such as hypnosis, dietary interventions, herbal medicine (Thornburg and Duncan, 2017), and acupuncture (Liu et al., 2017), may offer potential benefits for hemophilia management. For example, hypnosis has shown promise in reducing reliance on blood products and improving clotting, while acupuncture, although generally contraindicated due to bleeding risks, may have safer alternatives such as laser acupuncture or acupressure (Liu et al., 2017).

Traditional medicine has a long history of utilizing herbal remedies for the treatment of various ailments, including diseases related to children such as hemophilia (Behzadi and Narenjkar, 2024, Behzadi and Roosta, 2025). The use of medicinal plants in treating pediatric hemophilia may provide additional benefits (Taj et al., 2011). Herbal remedies with anti-inflammatory and hemostatic properties, as well as plant-based dietary supplements rich in vitamin K, could assist in managing hemophilia (Taj Eldin et al., 2016). A diet incorporating anti-inflammatory and astringent substances, such as fresh fruits and vegetables, may also prove beneficial (Cho et al., 2011). This review aims to identify medicinal plants traditionally employed in the management of pediatric hemophilia.

Methodology

This review aims to explore the role of medicinal plants in the treatment and management of pediatric hemophilia. The focus is on identifying traditional remedies and modern applications that have been utilized for this condition. To achieve this, a review of the literature was conducted, specifically targeting studies, traditional textbook and articles that address the use of herbal medicines and natural supplements in the context of pediatric hemophilia.

Search Criteria

The study utilized several reputable scientific databases, including PubMed, Scopus, Google Scholar, and Web of Science, to gather comprehensive information on the topic.

The review was restricted to articles published between 2000 and 2025, ensuring the inclusion of the most recent findings and advancements in the field.

Only articles that specifically addressed the use of medicinal plants and natural remedies for managing pediatric hemophilia were considered. This included studies on traditional and modern therapeutic applications of plant-based treatments.

Inclusion Criteria

Articles that provide insights into the traditional and modern use of medicinal plants in treating hemophilia in children.

Studies that examine the pharmacological properties of plant extracts and their effects on coagulation, bleeding control, and overall management of hemophilia.

Articles published in English or Persian, as they are widely accessible in the research community.

Exclusion Criteria

Articles that do not focus on hemophilia or medicinal plants.

Studies published in languages other than English or Persian, as they were not easily accessible for the purpose of this review.

Results

Herbs such as *Ginkgo biloba*, *Allium sativum*, *Zingiber officinale*, *Panax spp.*, *Aesculus hippocastanum*, *Curcuma longa*, *Salix alba*, *Rosmarinus officinalis*, *Daucus carota*, *Thymus vulgaris*, *Satureja hortensis*, *Vitis vinifera*, *Aloe vera*, *Matricaria chamomilla*, *Berberis vulgaris*, and *Salvia officinalis* have traditionally been used to treat hemophilia in both children and adults. Additional information on significant medicinal plants used for hemophilia is provided in table 1.

Sixteen plants from 12 different botanical families represent a remarkable diversity in both biological and medicinal aspects. The Lamiaceae family encompasses the largest number of plants (4 species: *Thymus vulgaris, Rosmarinus officinalis, Satureja hortensis, Salvia officinalis*), highlighting its importance in providing anti-inflammatory and antioxidant effects. Other families, such as Zingiberaceae and Ginkgoaceae, include plants with key roles in promoting blood circulation and reducing inflammation. Smaller families, such as Apiaceae and Vitaceae, contribute specifically to enhancing coagulation and vascular support.

Regarding the "probable mechanism" most plants exhibit anti-inflammatory, antioxidant, and circulatory-enhancing effects, which are crucial in managing hemophilia. Plants like *Ginkgo biloba* and Allium sativum not only reduce inflammation but also directly improve vascular flexibility and minimize blood clotting. *Daucus carota*, as the only plant rich in vitamin K, operates via a unique mechanism by aiding blood clot formation. Meanwhile, *Aloe vera* and *Matricaria chamomilla* primarily focus on wound healing and inflammation reduction compared to other plants.

The growth duration analysis revealed that, out of the 16 medicinal plants examined, 12 plants (equivalent to 75%) are perennials, while only 4 plants (equivalent to 25%) are annuals. This result indicates that the majority of the medicinal plants in use are perennials, which have a longer lifespan and can be harvested for medicinal purposes over the years. Subsequently, the classification of the plant types was assessed. Among the 16 medicinal plants, 9 plants (equivalent to 56.25%) are herbaceous, characterized by their soft, non-woody stems, and are primarily used for the production of extracts and pharmaceutical chemical compounds. The remaining 6 plants (equivalent to 37.5%) belong to the category of trees and shrubs, which are typically utilized for the extraction of active ingredients such as bark, leaves, and fruits. Only 1 plant (equivalent to 6.25%) falls under the category of succulents, which, due to their ability to store water in their tissues, are more commonly used for medicinal purposes in dry and desert regions. The results of these analyses indicate that the majority of the medicinal plants in question are perennials and herbaceous plants.

Table 1. medicinal plants with hematological and vascular benefits: Botanical classification, mechanisms, and traditional therapeutic uses

Common name	Scientific name	Herbal family	Traditional Therapeutic Effects	Botanical classification	Growth	Mechanisms
Ginkgo	*Ginkgo biloba*	Ginkgoaceae	Improves memory, treats blood circulation issues, anti-anxiety, cognitive disorders	Tree and shrubs	Perennial	Improvement of blood flow and vascular function, enhancement of vascular flexibility, as well as anti-inflammatory and antioxidant effects (Liu et al., 2017).
Garlic	*Allium sativum*	Amaryllidaceae	Lowers cholesterol, improves blood pressure, boosts immune system, antibacterial and antiviral properties	Herbaceous plants	Annual	Reduction of blood clot formation, anti-inflammatory and antioxidant properties, and contribution to the improvement of circulatory system function (Taj et al., 2011).
Ginger	*Zingiber officinale*	Zingiberaceae	Anti-nausea, reduces inflammation, relieves joint pain, aids digestion, antiviral	Herbaceous plants	Perennial	Anti-inflammatory and analgesic properties, enhancement of blood circulation, and reduction of the risk of bleeding and joint inflammations (Taj Eldin et al., 2016).
Ginseng	*Panax ginseng.*	Araliaceae	Boosts energy, reduces fatigue, strengthens the immune system, improves focus and memory	Herbaceous plants	Perennial	Immune system enhancement, improvement of blood circulation, anti-inflammatory, and anti-hemorrhagic effects (Cho et al., 2011).
Horse Chestnut	*Aesculus hippocastanum*	Hippocastanaceae	Reduces swelling and pain in the legs, improves circulation, treats varicose veins and hemorrhoids	Tree and shrubs	Perennial	Strengthening blood vessels, reducing joint swelling and pain, and improving blood circulation (Villamor et al., 2023).
Turmeric	*Curcuma longa*	Zingiberaceae	Anti-inflammatory, antioxidant, supports liver function, reduces joint pain, aids digestion	Herbaceous plants	Perennial	Anti-inflammatory and antioxidant properties, reduction of joint inflammation, and relief of internal pains (Norooznezhad et al., 2020).
White Willow	*Salix alba*	Salicaceae	Reduces pain, anti-inflammatory, treats fever and rheumatic conditions	Tree and shrubs	Perennial	Anti-inflammatory and pain-relieving properties, reduction of bleeding, and facilitation of the blood clotting process (Cordier et al., 2012).
Rosemary	*Rosmarinus officinalis*	Lamiaceae	Enhances memory, improves circulation, treats headaches, boosts immune system	Herbaceous plants	Perennial	Anti-inflammatory effects, increased blood circulation, improved immune system function, and reduced bleeding (Leite et al., 2020).

Table 1: Continued.

Carrot	*Daucus carota*	Apiaceae	Strengthens eyesight, improves digestion, antioxidant, lowers cholesterol	Herbaceous plants	Annual	Rich in vitamin K, aids in blood clotting, and strengthens the coagulation system (Daniell et al., 2016).
Thyme	*Thymus vulgaris*	Lamiaceae	Antibacterial, antiviral, treats coughs and respiratory issues, boosts immune system	Herbaceous plants	Perennial	Anti-inflammatory, enhances blood circulation, and reduces joint inflammation (Mashkani et al., 2023).
Greek Thyme	*Satureja hortensis*	Lamiaceae	Improves digestion, antibacterial, anti-inflammatory, relieves pain and muscle spasms	Herbaceous plants	Annual	Anti-inflammatory and antioxidant properties, reduction of internal and joint bleeding (Mashkani et al., 2023).
Grape	*Vitis vinifera*	Vitaceae	Antioxidant, strengthens heart and blood vessels, improves circulation, anticancer properties	Tree and shrubs	Perennial	Strengthening blood vessels, reducing bleeding, and antioxidant effects (De Curtis et al., 2003).
Aloevera	*Aloe vera*	Asphodelaceae	Soothes burns, hydrates skin, heals wounds, anti-inflammatory	Succulent plants	Perennial	Anti-inflammatory effects, soothing properties, and treatment of wounds caused by internal and external bleeding (Archibong et al., 2018).
Chamomile	*Matricaria chamomilla*	Asteraceae	Calming, anti-inflammatory, relieves stomach pain, promotes sleep	Herbaceous plants	Annual	Soothing properties, anti-inflammatory effects, and help in reducing joint pain and internal inflammations (Mahrous et al., 2022).
Barberry	*Berberis vulgaris*	Berberidaceae	Antibacterial, supports liver function, anti-inflammatory, strengthens immune system	Tree and shrubs	Perennial	Anti-inflammatory effects, improved blood circulation, enhanced immune system, and reduction of internal bleeding (Nor et al., 2019).
Sage	*Salvia officinalis*	Lamiaceae	Enhances memory, treats sore throat, anti-inflammatory, improves digestion	Tree and shrubs	Perennial	Anti-inflammatory and antioxidant properties, aiding in the reduction of inflammation and internal bleeding (Ege et al., 2021).

Discussion

The use of medicinal plants in managing diseases such as hemophilia, especially in children, has garnered increasing attention due to the limitations and risks associated with modern therapeutic approaches (Wang et al., 2015). Hemophilia, an inherited bleeding disorder, requires effective interventions to prevent severe bleeding episodes and associated complications (Thornburg and Duncan, 2017). While advanced therapies, such as coagulation factor replacement or gene therapy, have made significant strides, their high costs, limited accessibility, and side effects remain major challenges (Wang et al., 2015).

In this context, traditional and complementary medicine, utilizing medicinal plants, offers an opportunity to reduce bleeding and enhance blood clotting. According to studies, plants like *Ginkgo biloba* (Liu et al., 2017), garlic (*Allium sativum*) (Taj et al., 2011), ginger (*Zingiber officinale*) (Taj Eldin et al., 2016), and turmeric (*Curcuma longa*) (Cho et al., 2011) possess anti-inflammatory, antioxidant, and vascular-strengthening properties, making them potentially effective in managing hemophilia symptoms. Furthermore, plants containing secondary metabolites, particularly vitamin K, such as grape leaves (*Vitis vinifera*) (De Curtis et al., 2003) and sage (*Salvia officinalis*) (Ege and Ege, 2021), may aid in improving the coagulation process (Nor et al., 2019).

A critical aspect of utilizing medicinal plants is their safety and efficacy. Although traditional studies highlight the beneficial effects of these plants, the lack of sufficient clinical trials, particularly in pediatric populations with hemophilia, poses a significant limitation in this field (Lazare, 2020). Children with hemophilia, due to their high bleeding risk and sensitivity to treatments, require careful evaluation of the safety profiles of these plants (Wang et al., 2015). Nevertheless, the use of medicinal plants should not replace conventional treatments for hemophilia. Instead, these approaches could serve as complementary therapies alongside modern interventions (Jadhav et al., 2013). A diet enriched with plants possessing anti-inflammatory properties and herbal supplements containing vitamins and minerals may yield positive effects in reducing internal bleeding and strengthening the circulatory system (Jadhav et al., 2013).

Conclusion

Medicinal plants possessing anti-inflammatory and anti-hemorrhagic effects could provide valuable support in managing hemophilia in children by promoting blood clotting and minimizing internal bleeding. However, thorough clinical studies are essential to confirm their effectiveness and guarantee safety for use in pediatric patients.

Declarations

Conflict of Interest

There are no conflicts of interest.

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Consent for Publication

The authors approved the manuscript for publication.

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Authors' Contributions

Farhad Behzadi: Conceptualization, literature search, data curation, writing—original draft preparation, and visualization. Yusef Roosta: Methodology, validation, writing—review and editing, supervision, and project administration.

Ethical Considerations

All ethical issues (including plagiarism, misconduct, data fabrication, falsification, double publication, or redundancy) have been thoroughly observed by the author.

References

Archibong AN, Nku CO, Udefa AL, Leilei SA. Aloe vera gel reverses haemostatic derangement in rats following salt loading. World Journal of Pharmaceutical Research. 2018;7(4):91-100. doi:10.20959/wjpr20184-10839.

Azhar AAM, Raj AA, Izam F, Mokhtar MD, Zakaria NAI, Banerjee KG. The key complications of hemophilia and recent advancements in their management: an update. International Journal of Research in Medical Sciences. 2021;9(6):1800. doi: 10.18203/2320-6012.ijrms20212258.

Behzadi F, Narenjkar Esfahani R. Herbal remedies for bloating in traditional iranian medicine: natural antioxidants for managing abdominal bloating. Plant Biotechnology Persa. 2024: 6(2):1-7. doi: 10.61186/pbp.7.1.9.

Behzadi F, Roosta Y. A review of medicinal plants effective against iron deficiency anaemia. Plant Biotechnology Persa. 2025;7(1):1-10.

Bernardi F, Dolce A, Pinotti M, Shapiro AD, Santagostino E, Peyvandi F, et al. Major differences

in bleeding symptoms between factor VII deficiency and hemophilia B. Journal of Thrombosis and Haemostasis. 2009;7(5):774-9. doi: 10.1111/j.1538-7836.2009.03329.x.

Bunschoten EM, Van Houwelingen JC, Visser ES, Van Dijken PJ, Kok AJ, Sixma JJ. Bleeding symptoms in carriers of hemophilia A and B. Thrombosis and Haemostasis. 1988;59(3):349-52.

Castaman G, Matino D. Hemophilia A and B: molecular and clinical similarities and differences. Haematologica. 2019;104(9):1702. doi: 10.3324/haematol.2019.221093.

Cho YK, Jung Y, Sung H, Joo CH. Frequent genetic defects in the HIV-1 5'LTR/gag gene in hemophiliacs treated with Korean red ginseng: decreased detection of genetic defects by highly active antiretroviral therapy. Journal of Ginseng Research. 2011;35(4):413. doi: 10.5142/jgr.2011.35.4.413.

Coppola A, Di Capua M, Di Minno MND, Di Palo M, Marrone E, Ieranò P, et al. Treatment of hemophilia: a review of current advances and ongoing issues. Journal of Blood Medicine. 2010;1:183-95. doi: 10.2147/JBM.S6885

Cordier W, Cromarty AD, Botha E, Steenkamp V. Effects of selected South African plant extracts on haemolysis and coagulation. Human & Experimental Toxicology. 2012;31(3):250-257. doi: 10.1177/0960327111398675.

Daniell H, Chan HT, Pasoreck EK. Vaccination via chloroplast genetics: affordable protein drugs for the prevention and treatment of inherited or infectious human diseases. Annual Review of Genetics. 2016;50(1):595-618. doi: 10.1146/annurev-genet-120215-035349.

De Curtis A, Amore C, Donati MB, De Gaetano G, Iacoviello L. A procyanidin extract prolongs bleeding time but does not prevent thrombosis in rats. Journal of Thrombosis and Haemostasis. 2003;1(1):199-200. DOI: 10.1046/j.1538-7836.2003.00018.x.

Ege B, Ege M. The therapeutic applications of phytopharmaceuticals in dentistry. In: Phytopharmaceuticals: Potential Therapeutic Applications. 2021:191-222.

Franchini M, Mannucci PM. The history of hemophilia. In: Seminars in Thrombosis and Hemostasis. Thieme Medical Publishers; 2014 Jul;40(5):571-576. DOI: 10.1055/s-0034-1381232.

Jadhav U, Mukherjee K, Thakur H. Usage of complementary and alternative medicine among severe hemophilia A patients in India. Journal of Evidence-Based Complementary & Alternative Medicine. 2013;18(3):191-197. DOI: 10.1177/2156587213484339.

Kundu T, Ghosh K, Shaikh A, Singh P, Shaikh A, Shah H, et al. Homeopathic medicine reduces pain and hemarthrosis in moderate and severe hemophilia: a multicentric study. Complementary Medicine Research. 2018;25(5):306-12. doi: 10.1159/000486557.

Lazare DY. The effect of Malian herbal plants extracts on hemophilia A blood in vitro. EC Pharmacology and Toxicology. 2020;8:1-8.

Lazare DY. The effect of Malian herbal plants extracts on hemophilia A blood in vitro. EC Pharmacology and Toxicology. 2020;8:1-8.

Leite PM, Miranda AP, Amorim JM, Duarte RC, Faraco AA, dG Carvalho M, Castilho RO. Thrombin generation test with the calibrated automated thrombogram and anticoagulant activity of Mentha crispa. Blood Coagulation & Fibrinolysis. 2020;31(1):101-106. doi: 10.1097/MBC.0000000000000859.

Liu J, Wang H, Shang G, Wang L, Zhao H, Liu H. Acquired hemophilia A in a patient treated by Ginkgo-dipyridamolum. Clinical Case Reports. 2017;5(2):119. doi: 10.1002/ccr3.712.

Mahrous R, EL-Khair RA, Omar A, Ibrahim R. Investigation of the effect of selected edible and medicinal plants on in-vitro blood coagulation profile. Kuwait Journal of Science. 2022;49(4).

Mannucci PM. Hemophilia: treatment options in the twenty-first century. Journal of Thrombosis and Haemostasis. 2003;1(7):1349-55. doi: 10.1046/j.1538-7836.2003.00262.x.

Mashkani ZS, Vatandoost J, Hajjar T, Mahdavi B. In vivo coagulation effects of Thymus vulgaris leaves extract in mice. Avicenna Journal of Pharmaceutical Research. 2023;3(2):74-81. doi: 10.34172/ajpr.2023.1058.

Mauser-Bunschoten EP, Bresters D, Reesink HW, Roosendaal G, Chamuleau RAFM, Haan E, et al. Effect and side-effects of alpha interferon treatment in haemophilia patients with chronic hepatitis C. Haemophilia. 1995;1(1):45-53.

Nor NHM, Othman F, Tohit ERM, Noor SM, Razali R, Hassali HA, Hassan H. In vitro antiatherothrombotic effects of extracts from Berberis Vulgaris L., Teucrium Polium L., and Orthosiphon Stamineus Benth. Research Article. 2019. doi: 10.1155/2019/3245836.

Norooznezhad F, Rodriguez-Merchan EC, Asadi S, Norooznezhad AH. Curcumin: hopeful treatment of hemophilic arthropathy via inhibition of inflammation and angiogenesis. Expert Review of Hematology. 2020;13(1):5-11. doi: 10.1080/17474086.2020.1685867.

Rodriguez-Merchan EC, De la Corte-Rodriguez H. Complications of hemophilia in the elbow: current

management. Expert Review of Hematology. 2020;13(9):991-1001. doi: 10.1080/17474086.2020.1803061.

Rodriguez-Merchan EC. Effects of hemophilia on articulations of children and adults. Clinical Orthopaedics and Related Research. 1996;328:7-13.

Santagostino E, Fasulo MR. Hemophilia A and hemophilia B: different types of diseases? In: Seminars in Thrombosis and Hemostasis. Thieme Medical Publishers; 2013 Oct;39(7):697-701. doi: 10.1055/s-0033-1353996.

Shapiro AD, Donfield SM, Lynn HS, Cool VA, Stehbens JA, Hunsberger SL, et al. Defining the impact of hemophilia: the Academic Achievement in Children with Hemophilia Study. Pediatrics. 2001;108(6):e105. doi: 10.1542/peds.108.6.e105.

Soucie JM, Evatt B, Jackson D, Hemophilia Surveillance System Project Investigators. Occurrence of hemophilia in the United States. American Journal of Hematology. 1998;59(4):288-94.

Taj EIM, Abdalmutalab MM, Izzalddeen HM, Abdalkareem MA, Alhassan MB. Evidence for an in vitro anticoagulant activity of red onion (Allium cepa L.). Sudan Journal of Medical Sciences. 2011;6(2). DOI: 10.4314/sjms.v6i2.72459.

Taj Eldin IM, Elmutalib MA, Hiba A, Hiba F, Thowiba S, Elnazeer I. An in vitro anticoagulant effect of aqueous extract of ginger (Zingiber officinale) rhizomes in blood samples of normal individuals. American Journal of Research Communication. 2016;4(1):113-121.

Thornburg CD, Duncan NA. Treatment adherence in hemophilia. Patient Preference and Adherence. 2017;1677-1686.

Villamor G, Winograd D, Baum JD. Painful bruising: gynecology, hematology, or just pill bias? A case report. Case Reports in Women's Health. 2023;39:e00538. doi: 10.1016/j.crwh.2023.e00538.

Wang X, Su J, Sherman A, Rogers GL, Liao G, Hoffman BE, et al. Plant-based oral tolerance to hemophilia therapy employs a complex immune regulatory response including LAP+ CD4+ T cells. Blood, The Journal of the American Society of Hematology. 2015;125(15):2418-2427. doi: 10.1182/blood-2014-08-597070.

Wang X, Su J, Sherman A, Rogers GL, Liao G, Hoffman BE, et al. Plant-based oral tolerance to hemophilia therapy employs a complex immune regulatory response including LAP+ CD4+ T cells. Blood, The Journal of the American Society of Hematology. 2015;125(15):2418-2427. doi: 10.1182/blood-2014-08-597070.

White GC I, Rosendaal F, Aledort LM, Lusher JM, Rothschild C, Ingerslev J. Definitions in hemophilia. Thrombosis and Haemostasis. 2001;85(3):560.

Young G. New challenges in hemophilia: long-term outcomes and complications. Hematology 2010, the American Society of Hematology Education Program Book. 2012;2012(1):362-8. doi: 10.1182/asheducation-2012.1.362.

Zimmerman B, Valentino LA. Hemophilia: in review. Pediatrics in Review. 2013;34(7):289-95. doi: 10.1542/pir.34-7-289.