Pistachio Consumption and Blood Pressure

Zahra Jamali (PHD)[1,2], Mohsen Taghipour (MSc)[3*]

[1] *Pistachio Safety Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*

[2] *Clinical Research Development Unit (CRDU), Niknafs Hospital, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*

[3] *Non-communicable Diseases Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*

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Considering the increasing prevalence of high blood pressure (BP) worldwide [1] and the established relationship between diet and BP levels [2], we investigated the association between pistachio consumption and BP levels, drawing on existing research in this field.

Many studies have shown an inverse relationship between pistachio consumption and BP levels [3]. Knowing pistachio compounds and the possible role of each in BP control can help us better understand this relationship. Table 1 shows the macronutrients (Table 1-A) and mineral composition (Table 1-B) of dry pistachio nuts [4]. Pistachios contain many unsaturated fatty acids, including oleic, linoleic, and linolenic acids [5]. The presence of monounsaturated and polyunsaturated fatty acids, potassium, magnesium, antioxidants, fiber, and vitamins in pistachios may help pistachios have beneficial effects on BP [3, 5].

Table 1-A. Macronutrient of pistachio(Dry)

MUFA	PUFA	Proteins	CHO	Fiber	SFA	Water+ Ashes
24.5%	13.3%	21.0%	18.0%	10.3%	5.6%	4.9%

Table 1-B. Mineral composition of pistachio(Dry)

K	P	Mg	Ca	Others
59%	28%	6%	6%	1%

Macronutrient and mineral composition of pistachio (dry). A: The percentage of macronutrients in pistachios. B: The percentage of specific minerals from the total mineral amount. ‘‘Others’’ include iron, sodium, and zinc. MUFA indicates monounsaturated fatty acid; PUFA, polyunsaturated fatty acid; SFA, saturated fatty acid; CHO, carbohydrates regardless of fiber; PRO, protein. Data obtained from United States Department of Agriculture, Nutrient Database for Standard Reference, Release 28.[4].

Additionally, pistachios contain substantial amounts of arginine. Arginine can be converted into other bioactive substances, such as nitric oxide, which is a vasodilator and an antiplatelet factor [6]. The antioxidants in pistachios can reduce oxidative stress and the creation of reactive oxygen species (ROS).

Both of these are important factors in heart diseases and high BP [7]. Pistachios (dry) contain 10.3% fiber [4]. Dietary fiber can reduce BP by inducing satiation and reducing energy intake [8]. Additionally, pistachios contain 6% magnesium [4]. Magnesium consumption can lower BP because it blocks calcium channels, which causes vasodilation [9]. Also, magnesium helps produce prostacyclin and nitric oxide and regulates endothelium-dependent and independent vasodilation [10]. Pistachios can improve the concentration of endothelial indicators and endothelial function [11], which might be beneficial for BP.

On the other hand, pistachios have small amounts of saturated fatty acids, including palmitic acid, which is a risk factor for heart disease [4, 5]. The amount of sodium in pistachios is less than one percent [4]. Salt should not be added to pistachios, because the continuous consumption of salty pistachios can cause an increase in sodium intake and, as a result, an increase in BP [12]. Also, it is better to use raw pistachios to control BP because, by roasting pistachios, heat can cause the oxidation of beneficial unsaturated fatty acids in pistachios [13].

In a controlled feeding clinical trial, Fogacci et al. reported a significant effect of the pistachios on endothelial reaction and suggested that the pistachios affect the brachial artery diameter [14]. The research of Jiang R and her colleagues showed that the consumption of pistachios may prevent the development of atherosclerosis, the main parameter in the development of high BP [15]. Kasliwal et al. found that taking 80 grams of pistachios during 12 weeks in 60 adults with mild dyslipidemia improved glycemic and lipid factors and vascular stiffness and endothelial function (11). Khalili et al, in a cross-sectional study on 9990 people aged 35 and 70, found that the prevalence of high BP is lower among those who consume nuts, including pistachios [16].

Most research shows that pistachios can help reduce systolic blood pressure (SBP). A systematic review and meta-analysis of 13 randomized controlled trials (RCTs) with 563 participants by Esbaghi et al. showed that pistachio consumption can reduce SBP while not affecting diastolic blood pressure (DBP), C-reactive protein, and flow-mediated dilation [17]. Another review study of 11 RCTs by Ghanavati et al. with 506 participants reported that pistachios significantly reduced SBP [18]. West et al., in a clinical trial conducted on 28 individuals with dyslipidemia, observed that receiving a diet with 20% energy from pistachios for 1 month significantly reduced SBP [19]. Another study done by Sauder et al. showed that people with type 2 diabetes had lower SBP after eating a diet for four weeks where 20% of their energy came from pistachios [20].

In conclusion, pistachios can help reduce SBP and may have positive effects on cardiovascular health due to having unsaturated fatty acids, fiber, potassium, magnesium, arginine, and antioxidants. However, it is recommended to consume raw, and unsalted pistachios to avoid the negative effects of sodium and fatty acid oxidation. Also, due to the presence of palmitic acid and the potential for cardiovascular health risk, more research with a bigger sample size is needed to assess the best amounts of pistachios taking and long-term effects of its consumption on lipid profiles and vascular health.

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