



Review Article

Nutritional and Potential Health Effect of Pumpkin seeds.

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ARTICLE INFO

Key Words:

Pumpkin seeds, Medicine, Anticancer, Antioxidant, Nutraceutical

How to Cite:

Niazi, M. Khan, Hassan, F. H., Hassan Zaidi, S. Z. ul., Afzal sahi, A., Ashfaq, J., Ejaz, F., Amir, Z., & Imran, S. (2022). The Nutritional and Potential Health Effect of Pumpkin seeds: Health Effect of Pumpkin seeds. *Pakistan BioMedical Journal*, 5(6). <https://doi.org/10.54393/pbmj.v5i6.515>

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Received Date: 6th June, 2022

Acceptance Date: 20th June, 2022

Published Date: 30th June, 2022

ABSTRACT

The Cucurbitaceae family's pumpkin seeds are often viewed as industrial waste and discarded. In many regions of the world, seeds are eaten raw, boiled, or roasted, but only for personal consumption. Because they are high in protein, fiber, minerals, and vitamins, they may be considered essential for the food industry. Because the seeds are a byproduct of the pumpkin fruit, they are less expensive, and their inclusion in a variety of foods may result in higher nutritious content at a lower cost. Pumpkin seeds have been found to be beneficial to one's health. More research and study on the transformation of these agro industrial waste products into valuable materials is most likely a huge step in the right direction for worldwide efforts in food sustainability.

INTRODUCTION

Seeds and nuts have garnered increased attention in recent years due to the significant nutraceutical and therapeutic potential of their bioactive components [1]. Pumpkin seeds are not an exception. The Cucurbitaceae family includes pumpkins with oily seeds [2]. Pumpkins are grown for a variety of purposes around the world, ranging from commercial to decorative to agricultural [3]. Researchers have turned their focus to pumpkin because of its popularity in many traditional medicine systems (A.R. Abdel-Aziz). While pumpkin seeds are commonly thought

of as agro-industrial trash [4], they are nutritional powerhouses with intriguing nutraceutical qualities. After being roasted and salted, the seeds are frequently eaten straight as snacks. They're also employed in the baking business as food additives [5]. A large number of research have found a link between food's Natural bioactive components, illness prevention, and health promotion [6]. Functional foods are the foods that qualify this diet-health association. Plants are rich in bioactive chemicals and are frequently employed as functional food additives. Like

other seeds, pumpkin seeds are high in useful components. They include a lot of vitamin E (tocopherols), carotenoids, provitamins [7], pigments, pyrazine, squalene, saponins [8], phytosterols, phenolic compounds triterpenoids, and their derivatives [9], coumarins, unsaturated [10]. In addition, pumpkin seeds are high in potassium, magnesium, and phosphorus, as well as minor minerals [11]. Some of these bioactive and minerals have the potential to confer physiological benefits, promote well-being, and reduce the risk of non-communicable disorders such as tumors, microbial infections [12], hyperglycemia and diabetes [13], oxidative stress-related complications [14], prostate disorders, and urinary bladder complications [15]. Hepatoprotective [16], wound healing and hair-growth promoting, anthelmintic, antioxidant, and chemoprotective qualities are among the other medicinal properties of pumpkin seed extract (PSE) [17].

Components	Nutritional Values	RDA Percentage
Energy	559Kcal	28
Total Fats	49.05g	164
Carbohydrates	10.71 grams	8
Protein	30.23g	54
Cholesterol	0mg	0
Micronutrients (Vitamins)		
B3 (Niacin)	4.8mg	31.0
Vit. E	35.1mg	272
B9 (Folic acid)	58 micro gram	15
B6	0.14mg	11.0
B5	0.75mg	15.0
B1 (Thiamin)	0.272mg	23
Vit. A	16 IU	0.50
Vit. C	0.272mg	3.0
B2	0.15mg	12
Major Minerals		
K+	809.0mg	17.0
Na+	7.0mg	0.5
Mineral Deposits		
Mg	592mg	148
Cu	1.43mg	148.0
Zn	7.8mg	17.0
C+	46.0mg	4 1/2
P	1232mg	175
Fe (Iron)	8.8mg	110.0
Se	9.40 micro gram	17.0
Mn	4.54 mg	195
Phytochemicals		
Beta-Carotenoid	9 micro gram	--
Lutein-Zeaxanthin	74 micro gram	--
Beta-Crypto Xanthin	1 micro gram	--

Table 1: Nutritional Values of Pumpkin seeds per 100g..

Pumpkin seeds have numerous nutritional composition as shown in table 1. The seeds are very helpful for human health against diseases [18].

Potential Health Effects: Many research studies have demonstrated the health benefits and preventive effects of pumpkin as demonstrated in Figure 1.

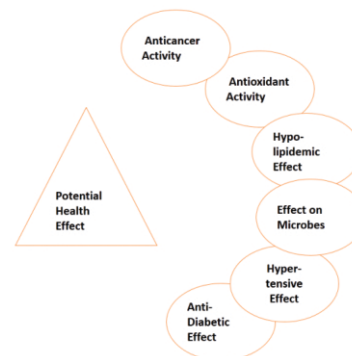


Figure 1: Potential Health Benefits

Anticancer Activity

Pumpkin seeds are a fantastic cancer preventative and/or therapy option. Pumpkin seeds extract has a cytotoxic effect on cancer cells and an increase in estrogen synthesis. This is contrary to the normal behavior of phytoestrogen chemicals, such as genistein and daidzein. In Sprague dawdle rats, pumpkin seed oil inhibited testosterone-induced hyperplasia. After three months of treatment with pumpkin seed oil, the symptoms of benign prostate cancer were minimized. Cucurbitains have been isolated from a number of different pumpkin seed types and have been demonstrated to cause apoptosis in cells [19,20].

Antioxidant Activity

The oil extracted from pumpkin seeds using cold pressure performed better in rat skin than the untreated group in an in-vitro study, according to Bardaa et al. [21-23]. Pumpkin seeds have a high antioxidant impact and protect against genotoxic chemicals, according to Elfiky et al (2012). Pumpkin seed oil was regularly and powerfully proved to be an antioxidant and free radical scavenger. According to Fahim et al., treatment with pumpkin seed oil lowered free radicals and improved arthritic symptoms (1995). Pumpkin seed extract also demonstrated antioxidant and Geno protective effects, according to Yasir et al. (2016). Overall, pumpkin seeds' high quantities of tocopherol could be considered protective against hazardous compounds and free radicals.

Hypolipidemic Effects

In an animal model-based experimental inquiry, Makni and his colleagues evaluated the role of a pumpkin seed and flax seed blend by feeding rats a 1 percent cholesterol diet. After the study was completed, they noted a significant increase. Based on the elevated antioxidant defense system and the level of malondialdehyde, the pumpkin and flex seeds combination had anti-atherogenic benefits

[24]. Pumpkin and flax seeds, as well as pumpkin and purslain seeds were used to study the effects of a 2 percent cholesterol diet are all edible seeds, lower lipid levels, and these seed combinations are regarded to have anti-atherogenic characteristics [25].

Effect on Microbes

Bacteria, parasites, viruses, and fungus are the leading causes of death in many people, despite a sanitary environment and food. Pumpkin seed oil includes antibacterial components that have been extracted from pumpkin seed oil. *Aeromonas veronii*, *Enterococcus faecalis*, *Candida albicans*, *Escherichia coli*, *Typhimurium*, *Salmonella enterica*, and *Staphylococcus aureus* are all inhibited by pumpkin seed oil at a dosage of 2%. [26]. The basic proteins MAP2, MAP11, and MAP4 found in pumpkin seeds have been used to inhibit yeast cell development. MAP11 was shown to have the most inhibitory effects of all the basic proteins [27]. Furthermore, it has been shown that phloem exudates from pumpkin seeds have anti-fungal characteristics and suppress the pathogenic fungus [28]. Park and his colleagues discovered the pr-1 protein from pumpkin seeds, which has antifungal properties and is nontoxic to human erythrocytes. It is a heat stable protein with no growth inhibitory action against *E. coli* and *Staphylococcus* bacteria at 700 degrees Celsius [29].

Hypertensive Effect

Pumpkin seeds aid in the reduction of blood pressure and the relaxation of blood vessels. In rats with high blood pressure caused by a chemical, the role and effects of pumpkin seed oil were investigated. The daily dose of oil for six weeks is between 40 and 100mg/kg. Chemical induction caused raised blood pressure, but consumption of the oil greatly lowered it, and ECG changes returned to normal. The overall result showed pumpkin seed oil's preventive impact against pathological alterations in the aorta and coronary heart. The amino acid L-arginine is used to indicate NO generation. Pumpkin seeds oil's high magnesium (mg) concentration has also been linked to a lower risk of coronary heart attack. The calcium channel blocker, amlodipine, has the same effects on pumpkin seeds as a dietary supplement [30].

Anti-Diabetic Effect

Diabetes is a chronic condition that affects people of all ages. Diabetes mellitus is a metabolic condition in which the body produces insufficient insulin or does not respond effectively to the insulin that is produced. The two most frequent kinds of diabetes are Type I diabetes and Type II diabetes. Pumpkin is often avoided by diabetics due to its high carbohydrate content even though pumpkin eating poses no risk. Pumpkin seeds and flax seeds combined have been shown to provide hypoglycemic and antioxidant benefits in diabetic rats. Histopathological changes

include decreased MDA (malondialdehyde and antioxidant enzyme) increased GSH (growth promoting hormone), CAT (Chloramphenicol acetyltransferase) and SOD (superoxide dismutase) [31].

CONCLUSION

The preceding investigations revealed that pumpkin seeds have nutritional and medicinal capabilities, and that they are also consumed as a delectable food in many parts of the world. The Analysis of the nutritional content of pumpkin seeds revealed that they are extremely nutritious and contain a wide range of necessary components. Pumpkin seeds offer nutritional and therapeutic properties and have been used for medicinal purposes. Pumpkin seeds are high in micronutrients and are utilized in the treatment and control of diabetes, cancer management, hyperlipidemia, hyper tension and heart protection, among other things. Pumpkin seeds are utilized for growing in Pakistan and then discarded as garbage. More research and knowledge about their dietary and therapeutic significance are needed so that people will include them in their regular diet.

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