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FOR NUTRITION AND DISEASES

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Abstract

Purpose: This study explores the potential of underutilized African nuts (Black walnuts and Almond) in nutrition and curing dietary diseases. The study attempts to find out the extent of consumption of Black walnut and Almonds among Staff and students of selected tertiary institutions in Nigeria and find out whether people not consuming these nuts (Walnuts and Almonds) have specific reasons for avoiding them.

Methodology: The study adopted survey research design to generate data for the study. The population of the study comprised of staff and students across three main federal institutions in Southwest region. The sample comprised of 300 respondents selected through a simple random sampling technique. The study also partly adopts interview to get the opinion of 30 randomly selected Traditional Herbal Practitioners in the study areas. Structured questionnaire designed based on the objectives of the study was used in data collection.

Findings: Data generated showed that majority of the respondents have little or no knowledge about the culinary, medicinal and

therapeutic benefits of these nuts let alone utilize them in their diets. The study also showed that majority of the respondents rejected these nuts because of negative allergic reactions (i.e. Acne, body itching, stomach cramp, diarrhea/vomiting and bitter after taste) experienced after consuming them. The report of some of the Traditional Herbal Practitioners interviewed corroborated the fact that Almonds and black walnuts have potentials for curing many dietary diseases.

Conclusion: Based on these findings, the researchers conclude that Almonds and walnuts should form active parts of family's diet and that health officials and nutritionist should collaborate in organizing seminars and workshops on the need to live healthy life and fight against commons preventable diseases through consumption of nuts (walnuts and almonds)

Keywords: *Almond, Black walnuts, Culinary, Medicinal, Therapeutic, Nutritional and Dietary Diseases.*

1. INTRODUCTION

Human life and existence have continuously been threatened with a number of preventable diseases. Some of these diseases which include high blood sugar, diabetes mellitus, hypertension, indigestion, and heart related diseases and other gastro-intestinal disorders are nutritional and dietary related. Seeking solutions to these life threatening diseases have not been easy especially as their medical treatments are very expensive and not generally affordable. The need to seek alternative herbal remedy from locally available nuts with inherent medicinal and therapeutic benefits informed this study.

Today, the earth is increasingly becoming a difficult place to live. This is because a number of diseases have ravaged and are still ravaging the human existence. Unfortunately, majority of these diseases are nutritional and dietary related. Healthy food consumption is one of the essential requirements for long life, but today's world has been adapted to a system of consumption of foods which have several adverse effects on health [1]. Eating meals without considering the nutritional consequences have led to increased weight and other nutritional related problems in many individuals. Hence, because of unhealthy food consumption pattern, human life and existence have continuously been threatened with a number of preventable diseases. Some of these diseases which include high blood sugar, diabetes mellitus, hypertension, indigestion, and heart related diseases and other gastro-intestinal disorders are traceable to nutritional and dietary related problems. Hence, the need for human to embrace healthy eating style and allow functional foods to form parts of their daily diets [2].

Nuts generally are part of functional foods and their consumption was reported by [3], to protect against cardiovascular disease, certain types of cancer, diabetes and others disease states, including neurodegenerative conditions. African Black Walnut and Almonds are important but underutilized nuts with inherent medicinal and therapeutic potentials for promoting human health. [3], reported that Almonds (*Prunus dulcis*) and Black walnuts (*Tetracarpidium conorphorum*) are helpful in reducing blood cholesterol levels, reducing the risk of heart disease, control of body weight and control of diabetes. These nuts (Walnut and Almond) are also believed to naturally contain high levels of monounsaturated and polyunsaturated fatty acids, protein and dietary fibre, as well as a variety of essential nutrients including vitamin E and several trace elements which contribute significantly to healthy living [4].

Several epidemiologic and clinical studies have reported remarkable health benefits through the consumption of tree nuts, including effects against cardiovascular diseases (CVDs), diabetes, inflammatory process, oxidative stress, cancer and neurodegenerative conditions [5]. The health promoting properties derived from Almonds and Walnuts (leaves, roots, husks and nuts) have been mainly attributed to unsaturated fatty acids composition and other bioactive nutrients such as phenolic compounds, tocopherols, phytosterols, high-quality vegetable protein, fiber and minerals [6]. Africa is generally blessed with herbal plants whose roots, shoots, stems, leaves, seeds, fruits, nuts are loaded with natural nutrients and chemicals which have nutritional, medicinal and therapeutic benefits to prevent, cure and control some of the nutritional diseases threatening human

life. Table 1 and 2 below summarizes the data on botanical identification, chemical and nutrient composition, culinary uses, medicinal and therapeutic properties of African black walnuts and Almonds respectively

Table 1: ***Botanical Description, Chemical and nutrient contents, Culinary, Medicinal and Therapeutic Benefits of African Black Walnuts***

Botanical Names & Distribution	Chemical And Nutrient Composition	Culinary Uses	Medicinal/Therapeutic benefits
<p>African Black Walnuts <i>Tetracarpidium conorophorum</i></p> <p>The parts used includes: Husks, Leaves, Nuts, Inner back etc. The plant is predominantly available in the Southwest states of Nigeria.</p>	<p>Phenolic compounds which increases the antioxidants potentials of the nuts these includes :</p> <ul style="list-style-type: none"> • ellagic-acid • ellagitanins, • galic-acid • chromogenic acid • juglone • nucin • selenium • foliate • Phytosterols • oleic-acid • omega 3-fatty-acid • linoleic-acid • Tocopherol etc. 	<p>Oil extracted from the nuts is used in domestic cooking.</p> <p>The nuts are eaten as snack.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Aids in the treatment of tuberculosis, diarrhea, female disorders, and sore throat and lung diseases. <input type="checkbox"/> Aids digestion and promotes healing of the sores in the mouth or throat. <input type="checkbox"/> Cleanses the body of tapeworm and parasites <input type="checkbox"/> Used in weight management, prevention and slowing of various cancers <input type="checkbox"/> Eating the seed regularly help to increase sperm counts <input type="checkbox"/> Juice extracted from the leaves is a useful remedy for haling of wounds and to improve fertility in women <input type="checkbox"/> Regular consumption can boost brain development in children <input type="checkbox"/> Useful in the treatment of Type 2 obesity <input type="checkbox"/> Epidemiological studies have shown significant and positive association between regular consumption of walnuts and cancer and cardiovascular diseases <input type="checkbox"/> Promotes quality sleep <input type="checkbox"/> Reduces cholesterol level <input type="checkbox"/> <input type="checkbox"/> The leave extract is effective against headache, malaria, prolonged hiccups, insect sting, scorpion sting and generally for treating fibroids

Source: [7], [8]. [9] & [10].

Table 2: *Botanical Description, Chemical and nutrient contents, Culinary, Medicinal and Therapeutic Benefits of Almonds*

Botanical Name & Distribution	Chemical And Nutrient Composition	Culinary Uses	Medicinal/Therapeutic benefits
<p>Almond Prunes Amygdalus dulcis or Prunes Amygdalus amara</p> <p>The part used are the roots, stem, bark, shoot, leaves, fruits and the nuts.</p> <p>The plant of almond can be found majorly in southern parts of Nigeria but can also be found in other parts of Nigeria</p>	<p>Almonds contain polyphenols in their skin consisting Flavonols, Flavin-3-ols. Hydroxybenzoic acid (These phenolic compounds have commercial interest as food additives and dietary supplements).</p> <p>Other important nutrients found in almonds are:</p> <ul style="list-style-type: none"> • Riboflavin • L-carnitine. <p>Almonds are also very rich in Amino acids such as</p> <ul style="list-style-type: none"> • Arginine • Cysteine • Asphatic acids • Glutamic acids • Lysine • Phenylalanine etc. <p>Almonds are low in Sodium and high in potassium</p>	<p>The fresh fruit can be eaten raw or toasted</p> <p>The grated nut can be used in garnishing various dishes such as pastries, cookies and cakes</p> <p>The nuts can be used in making almond butter (a spread similar to peanut butter</p> <p>The nut can be extracted for edible oils used in cookery</p> <p>Can be produced into a milk substitute call almond milk (which can be utilized by lactose intolerant people and vegans)</p> <p>Almond flour mixed with sugar or honey is often used as a gluten free alternative to</p>	<ul style="list-style-type: none"> □ High in antioxidants that can protect body cells from oxidative damage (a major contribution to ageing and disease control) □ The antioxidants in almonds cleans the skin by eliminating toxins and free radicals □ Regular consumption provide brain power as they contain essential nutrients which can actually help improve thinking capabilities □ Oil from the almond milk serves as skin care (45 almonds nut crushed into powder and mix with 1 teaspoon of milk, 1 teaspoon of lemon juice plus small quantity of wheat flour is regularly apply on the face for 30 minutes to get a fairer completions) □ Almond oil plus lemon juice, honey and milk can be used in the treatment of Acne, Blackheads and Whiteheads □ Regular consumption of almonds (fruits) can be helpful in regulation of blood pressure as they are high in potassium and low in Sodium □ Regular consumption of almonds or almond dishes can lengthens ejaculation in men □ The oil can be used for massage therapy to relief sprains

		wheat flour in cooking and baking	
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Source: [5] & [11].

2. METHODOLOGY

The study was conducted by using survey research design method. The study population consisted of all staff and students of 3 federal tertiary institutions in Lagos State Nigeria (Federal College of Education Technical Akoka, Yaba College of Technology and University of Lagos. Lagos, Nigeria. 100 staff and students were selected in each of the institutions using a simple random sampling technique. One-on-one interview was conducted with 30 Traditional Herbal Practitioners selected in 3 major herbal markets in Lagos state to find out their views on the therapeutic and healing applications of African Black walnuts and Almonds. Hence, 330 respondents were used for the study. Structured questionnaire titled “Consumption and Knowledge of Medicinal and Therapeutic

benefits of Black walnuts and Almonds” Was used to elicit responses from the 300 selected staff and students. The questionnaire had 3 main parts with each tailored to generating data on the problem of study and it was validated by 3 experts in the field of food and nutrition and measurement and evaluation (one in each of the 3 institutions used for the study). Test-re-test method was used to test the reliability of the questionnaire before it was eventually administered to all the 300 study participants. A four Likert scale options of Strongly Agree (4), Agree (3) Disagree (2) and Strongly Disagree (1) was used in data collection. Data analysis employed the use of simple percentage, mean score, standard deviation, bar chart and pie chart to represent descriptive statistics. The questionnaire items with mean rating of 2.5 and above were remarked as agreed while other means below 2.5 were remarked as disagreed.

3. RESULTS AND DISCUSSION

3.1. Assessment of the Knowledge of Culinary, Therapeutic and Medicinal Potentials of Black Walnuts and Almonds

Table 3: Mean Responses of respondents on the Knowledge of Culinary, Therapeutic and

S/N	Questionnaire Items	Mean	SDV	Remarks
1	Walnuts and Almond are crunchy foods with delicious taste which give sense of filling after consumption	1.96	0.63	Disagree
2	The grated nut of Almonds can be used in garnishing various dishes such as pastries, cookies and cakes	1.88	0.61	Disagree
3	Oil extracted from walnuts is used in domestic cooking.	1.66	0.58	Disagree
4	Regular consumption of almonds or almond dishes can lengthens ejaculation in men	0.87	0.42	Disagree
5	Regular consumption of almonds (fruits) can be helpful in regulation of blood pressure as they are high in potassium and low in Sodium	2.45	0.70	Agree
6	A decoction of the almond leaves taken regularly is helpful in sickle cell anemia situation	0.24	0.22	Disagree
7	The leave extract is effective against headache, malaria, prolonged hiccups, insect sting, scorpion sting and generally for treating fibroids	1.03	0.45	Disagree
8	Epidemiological studies have shown significant and positive association between regular consumption of walnuts and cancer and cardiovascular diseases	1.58	0.56	Disagree
9	Eating the walnuts regularly help to increase sperm counts in men	0.72	0.38	Disagree
10	Juice extracted from the leaves of walnuts is a useful remedy for haling of wounds and to improve fertility in women	1.07	0.46	Disagree

Medicinal Potentials of Black Walnuts and Almonds

Field work (2019)

Table 3 showed the mean responses of the respondents on the knowledge of culinary, therapeutic and medicinal potentials of Walnuts and Almond as utilized in different forms. Data generated showed that majority of the respondents have little or no knowledge about the culinary, medicinal and therapeutic benefits of these nuts let alone utilize them in their diets. The knowledge on the core potential areas of these nuts such as utilizing the leaves to neutralize scorpion stings, insect stings, and treatment of fibroids, cancer and cardiovascular diseases is very low.

The usefulness (Culinary, medicinal and therapeutic) of African Black walnuts and Almond were well articulated in literatures especially those of [7], [8], [9] & [10] who generally believe that African Black walnut can aids in the treatment of tuberculosis, diarrhea, female disorders, and sore throat and lung diseases when consume regularly and that regular consumption of walnuts can help in cleanses the body of tapeworm and parasites. [12], also believe that regular consumption of walnuts can boost brain development in children and that eating the seed regularly helps to increase sperm count in men while Juice extracted from the leaves is a useful remedy improve fertility in women. Studies from these authors have also shown significant and positive association between regular consumption of walnuts and cancer and cardiovascular diseases. Similarly, [13] & [11] wrote that almonds are high in antioxidants that can protect body cells from oxidative damage (a major contribution to ageing and disease control) and that regular utilization of almond provide brain power as they contain essential nutrients which can actually help improve thinking capabilities

3.2. Frequency of consumption of *Black Walnut and Almonds by the Respondents*

The respondents reported different degree of extent of consumption of these nuts ranging from “consuming it often, consuming it occasionally, consuming it seldomly and not consuming it at all” This result is represented in Fig. 1 below

Fig. 1: Bar Chart Showing Frequency of Consumption of African Black Walnut among Respondents

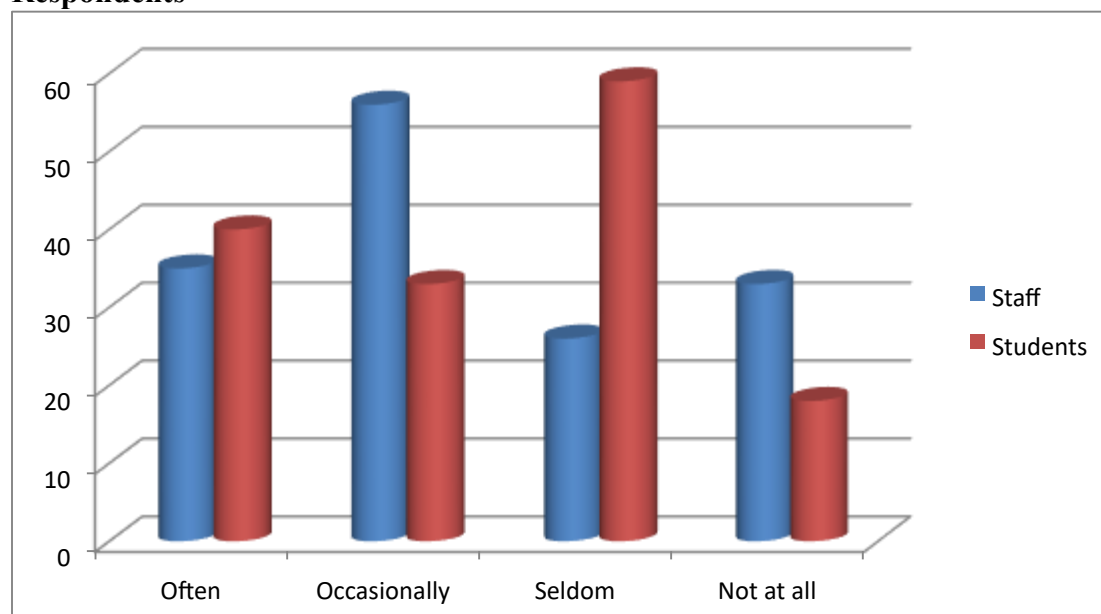
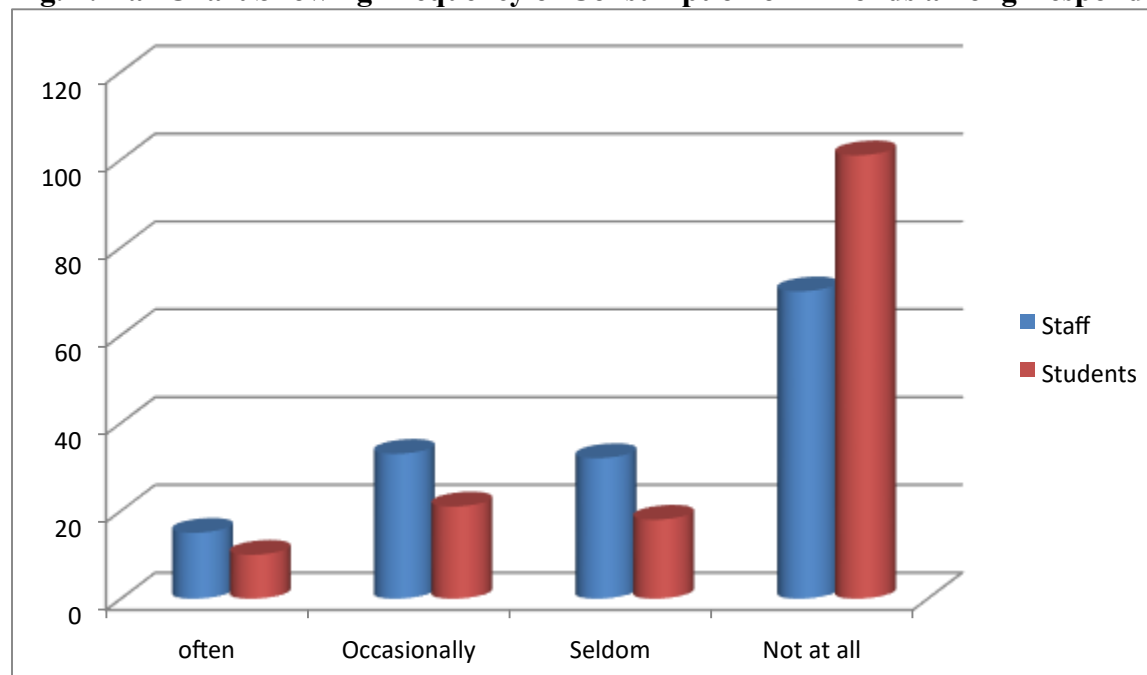


Fig. 2: Bar Chart Showing Frequency of Consumption of Almonds among Respondents



Data shown in Fig 1 & 2 indicated that the respondents did not appreciate the inclusion of Almonds in their diets as higher percentage (students and staff) reported not consuming it at all. Although the data for wall nuts showed that higher percentage of the respondents consume it often and

occasionally, it is generally shown that the consumption and appreciation of these nuts as functional foods loaded with high nutritional, therapeutic and medicinal potentials is still very low.

3.3. Specific reasons given by the respondents for not consuming Black walnut and Almonds

Varying reasons were given by the respondents for rejecting Almonds and Black Walnuts in their diets. Some of the reasons given are: Bitter after taste, Allergic reactions (such as Itching, body rashes, Acne), nausea or vomiting, bloating, constipation, stomach cramp etc. Fig.3 showed the percentage occurrence of these side effects reported by the respondents.

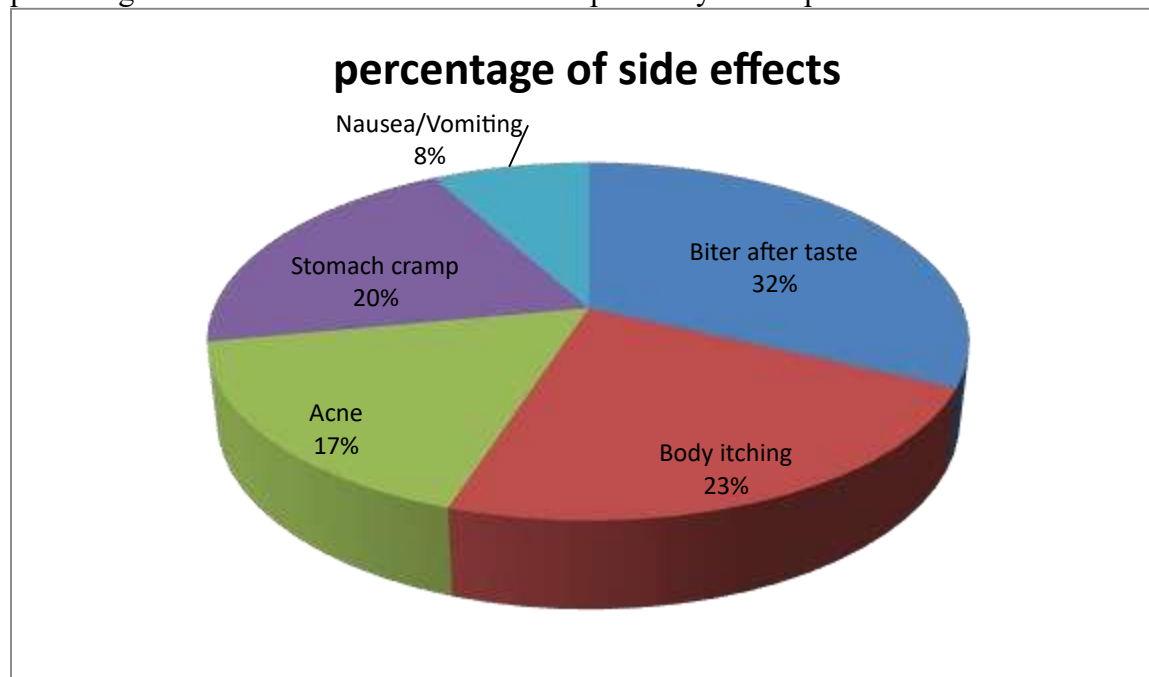


Fig. 3: Pie Chart Showing the Percentage Occurrence of Side Effects of Almonds and African Black Walnuts

Data in Fig. 3 showed that 32 percent of the respondents reported bitter after taste of the nuts for rejecting it in their diets, 20 percent reported having stomach cramps and irritation immediately after consuming Almonds and Black Walnuts, hence the reason for rejecting them in their diets. Meanwhile, 23 percent of the respondent do not like to consume these very important functional foods on the ground that Body itching is usually the result of consuming them. Only 17 percent of the respondents rejected these nuts because they result in Acne while 8 percent often experience nausea/vomiting after consuming Black Walnuts and Almonds.

These findings corroborates those of [14] & [15] who believe that although the consumption of tree nuts including Almonds and Walnuts have generally been proven to be healthy source of diet, they however can also induce some adverse allergic reactions in susceptible individuals and thus recommend that clear allergen labeling of food products containing nuts and other potentially allergenic foods is required to help educate people living with these allergies and their families on how to recognize early symptoms of an allergic reaction and how to treat them promptly.

3.4. Views and Opinions of Traditional Herbal Practitioners on the utilization of Black Walnuts and Almonds in curing and preventing diseases in human

Table 4: Diseases Traditionally Cured/Treated with Black Walnuts and Almonds

S/N	Diseases	Nuts	Parts Used	Method of preparation	Administration/Dosage
1	Sickle cell Anemia (5)	Almond	Fresh leaves	A decoction of the leaves taken as tea (The fresh leave are washed and dry in dark place without sunlight, crushed and cook in clean water to be taken as tea)	A glass cup to be taken morning before food and at light after dinner
2	Sores and Wounds (8)	Black Walnuts	Fresh leaves and nuts	Juice is extracted from the fresh leaves. Oils are extracted from uncooked fresh nuts	The juice is used to wash the affected parts. The oil is then used to rub the parts. This is done morning and night until significant improvement is seen
3	Headache and Malaria (10)	Black walnut and Almond	Leaves and husk	Fresh leaves and husk is boiled together in clean water. Juice is extracted from the fresh leaves	The decoction is taken regularly as tea. Young fresh leaves is rubbed on the forehead so that the juice can penetrate to relief headache
4	Insect sting and Scorpion sting (7)	Black walnut	Fresh leaves	Fresh young leaves are squeezed using the palm to extract the juice	An incision is made with blade on the spot of sting and applied on the spot generously to neutralize the poison

Source: (Field investigation, 2019)

From the result in Table 4, five (5) of the 30 herbal practitioners have used and recommended the fresh leaves of Almond to treat sickle cell anemia, 8 of them have used and recommended the fresh leaves and nuts of Walnuts to treat sores and wounds while 10 of the herbal practitioners have utilized the leaves and husk of walnuts to solve problems of headache and malaria. The juice from the fresh leaves of walnut plant has been used by 7 of the herbal practitioners to neutralize the poison from insect and scorpion stings. The report of some of the Traditional Herbalist interviewed corroborated the fact that almonds and walnuts are functional foods loaded with healing and therapeutic properties to treat or cure different diseases ranging from tuberculosis, diarrhea, headache, malaria, cancer, sickle cell anemia [6].

4. CONCLUSION

Results of the current study have shown that Black Walnuts and Almonds are functional foods with inherent nutritional composition and bioactive compounds capable of promoting multiple health benefits. These compounds have been associated with protection against multiple diseases, including cardiovascular health, certain cancers, diabetes, neurodegenerative conditions, and others disease states related to oxidative and inflammatory stress. In a nutshell, almonds and walnuts are natural healthy food choice for the individuals and family members.

5. RECOMMENDATIONS

Based on the results and conclusion drawn from the study, the researchers provided the following recommendations

1. The consumption of black walnuts and almonds should be encouraged as potential food source to improve and promote public health. These nuts should be used to replace foods that are high in saturated fatty acids, sugars and salts and those lacking in vitamins, minerals and antioxidants constituents.
2. Those seeking to regulate their body weight and reduce cholesterol level significantly in their body should embrace regular inclusion of Black walnuts and almonds in their diets.
3. Health officials and nutritionist should collaborate in organizing seminars and workshops on the need to live healthy life and fight against commons preventable diseases through consumption of nuts (walnuts and almonds)
4. As interest in incorporating almonds and walnut into the habitual diet grows, it is important that consumers understand how to include them in a healthy diet without promoting weight gain and avoiding negative allergic reactions. Thus, clear allergen labeling of food products containing nuts and other potentially allergenic foods is required to help educate people living with these allergies and their families on how to recognize early symptoms of an allergic reaction and how to treat them promptly.

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