

INTERNATIONAL JOURNAL OF UNANI AND INTEGRATIVE MEDICINE



E-ISSN: 2616-4558
P-ISSN: 2616-454X
www.unanijournal.com
IJUIM 2024; 8(3): 29-34
Impact Factor (RJIF): 6.3
Peer Reviewed Journal
Received: 09-07-2024
Accepted: 16-08-2024

Dr. Mohammed Ismail
P.G. Scholar, Tahaffuzi wa Samaji Tib H.S.Z.H Government Autonomous Unani Medical College, Bhopal, Madhya Pradesh, India

Iftikhar Ahmad
Professor, Tahaffuzi wa Samaji Tib H.S.Z.H Government Autonomous Unani Medical College, Bhopal, Madhya Pradesh, India

Syed Ameer Hasan
Lecturer, Tahaffuzi wa Samaji Tib Yunus Fazlani Unani Medical College & Hospital, Kunjkhedra, Kannad, Aurangabad, Maharashtra, India

Madiha Ali
P.G. Scholar, Tahaffuzi wa Samaji Tib H.S.Z.H Government Autonomous Unani Medical College, Bhopal, Madhya Pradesh, India

Mohd Anas
P.G. Scholar, Tahaffuzi wa Samaji Tib H.S.Z.H Government Autonomous Unani Medical College, Bhopal, Madhya Pradesh, India

Corresponding Author:
Dr. Mohammed Ismail
P.G. Scholar, Tahaffuzi wa Samaji Tib H.S.Z.H Government Autonomous Unani Medical College, Bhopal, Madhya Pradesh, India

Dietary patterns in Unani medicine: An integrative approach for managing diabetes mellitus: A comprehensive review

Dr. Mohammed Ismail, Iftikhar Ahmad, Syed Ameer Hasan, Madiha Ali and Mohd Anas

DOI: <https://doi.org/10.33545/2616454X.2024.v8.i3a.294>

Abstract

Diabetes is a chronic metabolic disease caused by the inability of the pancreas to produce enough insulin or the body's inability to use it effectively. It is influenced by daily changes in nutrition, excretion, stress and infection. It is a major cause of morbidity and mortality worldwide. Diabetes can be classified into three broad types: Type 1, Type 2 and gestational. The prevalence of diabetes is estimated to increase from 171 million in 2000 to 528 million in 2035. In the Unani System of Medicine, diabetes is a chronic condition characterized by a vicious cycle of water intake and excretion, often referred to as Dawwarah and Barkarriyaah, Silsil-Al-Baul, Zalaqul-kulliyah, Marz-e-Majari, and Zalaq-e-Kulliya. Various Unani physicians have described diabetes in their literature, Diabetes can be managed by certain diet and several herbal drugs in the unani system of medicine. The present review presents a brief introduction focusing on common single herbal drugs having hypoglycaemic activity used for the treatment and control of Diabetes in unani medicine throughout the Indian Subcontinent.

Keywords: Diabetes, Unani system of medicine, Dawwarah, Ilaj-Bil-Ghiza, Ziabetus

1. Introduction

Diabetes is a chronic metabolic disease that occurs when the pancreas does not make enough insulin or the body's inability to effectively use the insulin it does produce. Insulin controls blood glucose. Hyperglycemia, also called raised blood glucose level or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to the body's systems, especially the blood vessels and nervous system [1]. Diabetes is a disorder significantly impacted by daily changes in nutrition, exercise, stress, and infection [2].

Diabetes is a major cause of morbidity and mortality worldwide. The word diabetes comes from the Greek "diabanein" which means to pass through, about the excessive urine produced as a symptom of these diseases [3].

1.1 Types of Diabetes

The majority of diabetes can be classified into three broad classifications, they are type 1, type 2 and 3 (Gestational diabetes).

Type 1 diabetes mellitus also known as Insuline dependent diabetes mellitus [IDDM]. Type-1 DM is characterized by loss of insulin production it occurs because of dysfunction or absence of β -cell in the islet of Langerhans in the pancreas [4]. This type of diabetes of the immune-mediated or idiopathic [5]. It may occur at any age of life but when it occurs in infancy due to a congenital disorder it is called "juvenile diabetes".

Type-2 diabetes mellitus is known as Non insuline dependent diabetes mellitus [NIDDM].

Type 2 diabetes is known as noninsulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. It is a metabolic disorder that is defined by high blood glucose in the context of insulin resistance and relative insulin deficiency. It occurs due to the absence or deficiency of insulin receptors [6].

Gestational diabetes is a type of diabetes mellitus conditions which occur in a non-diabetic pregnant woman. This condition usually develops near the end of 38 weeks of pregnancy until 12 weeks of parturition. This condition usually returns to normal soon after delivery. Glucose is used by cells in the body for fuel for growth and energy. Abnormal glucose levels

during pregnancy can be extremely harmful to both the mother and the baby ^[7].

1.2 Prevalence of Diabetes

The prevalence of diabetes among all age groups was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of diabetics is expected to grow from 171 million in 2000 to 366 million in 2030 and 528 million in 2035. The urban population in developing nations is projected to double between 2000 and 2030. The most important demographic change related to diabetes prevalence across the world appears to be increase in the proportion of people >65 years of age ^[8, 9].

Currently available medication for curing or managing diabetes: Patients with diabetes are a major player in the management of their condition. Diabetes self-management entails taking prescribed drugs as directed by a diabetes specialist; however, medication nonadherence may be partially attributed to the drugs themselves, including weight gain, erratic postprandial glucose fluctuations, and sharp drops in blood sugar that result in hypoglycemic episodes.

Although multifactorial, medicine nonadherence may also be caused by comorbidities of diabetes, encompassing cognitive impairment and depression, as well as financial strictures ^[10]. Antidiabetic drugs are a basic strategy for managing type 2 DM. Current commonly used antidiabetic drugs incorporate the following groups: metformin, sulfonylureas, clinides, thiazolidinediones, α -glucosidase inhibitors, incretin-based agent-like glucagon-like peptide-1 (GLP-1) receptor agonists, dipeptidyl peptidase-4 (DPP-4) inhibitors, sodium-glucose cotransporter 2 (SGLT-2) inhibitors and insulin ^[11].

Other novel antidiabetic drugs are currently emerging. Importantly, natural products, i.e. Herbal medicines and their active ingredients have been shown to have antidiabetic properties while causing less toxicity and adverse effects.

1.3 Literature Review

The Unani system of medicine, enormously rooted in historical traditions, has traversed centuries and cultures, contributing to the healthcare landscape through its holistic and individualized approach. Developed by ancient physician in Unani medicine, such as Hippocrates and Galen, Unani medicine amalgamates wisdom from Greek, Roman, Persian, and Indian sources, creating a comprehensive framework focused on reinstating and sustaining harmony among the body, mind, and spirit. The global health epidemic of diabetes has cast its shadow on millions of lives, placing an overwhelming burden on healthcare systems and individuals alike ^[12].

1.3.1 Many unani physicians have described diabetes in unani literature

Maqala Fil-Baul of Rufs al-Afsi (2nd cent.AD), Kitab Fil-Baul of Hunain Ibn Is'haaq (1188 AD), and Kitab Ma'rafa Al-Baul of Is'haaq Bin Hunain (828-911 AH), are worth mentioning ^[13]. Diabetes is referred to as Dawwarah and Barkarriyaah (Revolving, whirling) due to the seemingly never-ending vicious cycle of water intake and excretion. Diabetes mellitus is also known as Silsil-Al-Baul because, as the disease advances, the urgency of micturition also occurs, which is frequently not curable. Apart from that,

diabetes is also referred to as Zalaqul-kulliyah, Marz-e-Majari & in some books. Ibn Hubal Baghdadi referred to the disease by the names of Ziabetus, Barkariyah, Dulabiya, Zalaq-e-Kulliya etc. ^[14, 15].

According to Ahmad al-Hasan urbani, there are four primary factors responsible for the causation of polyuria in Ziabetus: weakness of the kidneys, dilatation of the urethra, and cold temperament of Liver or Kidneys ^[16].

According to Ibn Rushd (1126-1198 AD), increased kidney Quwwat-e Jaziba (Power of absorption) is the cause of diabetes. At the same time, the water is expelled without going through metabolism due to the weakening of the Quwwat-e-Masika (Power of retention). He was referred to the disease as Silsil-al-Baul (Polyuria), Barkan & Barkariyah ^[17].

Zakariyah Razi recited the Jalinoos statement in Al-A'za-e-Alima that Ziabetus (Diabetes) is similar in nature to Zalaqul-Ama (Lienteric diarrhoea) ^[18].

Burhanuddin Nafees (d.1438 AD) mentioned renal dysfunction, fault, Weakness, hot temperament, and kidney inflammation as contributory factors of diabetes. He claims that diq, which is caused by abnormal fluid excretion and results in a state of dehydration, maybe a consequence of diabetes. Burhanuddin Nafees also mentioned cold temperament as a causative factor of diabetes which weakness the Quwwat-e-Masika (Power of retention) ^[19].

1.4 Holistic approaches

Unani System of Medicine is one of the oldest traditional systems of medicine which has worked through ages in the prevention and treatment of several medical conditions. Unani is derived from the Arabic word for Ionian, or Greek. Popular Unani medicine is also known as Unani Tibb or Graeco-Arab Medicine, as Arabs have developed and refined it through systematic experiments prominently by Avicenna. Under the patronage of the Hippocrates, the Unani medical system began to emerge in ancient Greece in the 5th and 4th centuries B.C. Scientific principles and profound philosophical insights form the foundation of its framework. This medical system treats patients as individuals and provides preventive, curative, and rehabilitative care. The true source of disease is an imbalance in the body's natural humours. Disease results from an imbalance between the quantity and quality of these humours; however, maintaining one's health requires restoring this balance. According to the holistic perspective, mental, physical, and spiritual discord frequently leads to illness and injury. A dysfunction in any one of these domains can frequently be the source of discord. This system provides treatment of diseases related to all systems and is based on the Hippocratic theory of four humours that is Blood (Dam), Phlegm (Balgham), Yellow bile (Safra), and Black bile (sauda) and also the four qualities of state of living human body like Hot, Cold, Moist and Dry. They are represented as Earth, water, fire, and air ^[20].

2. Fundamental Principle of Unani medicine

Greek beliefs were put by Arabic physicians as seven principles, the health of the human body is maintained by the homeostasis of al-umoor al-tabiyyah, the seven basic physiological principles of the Unani doctrine ^[21-23].

2.1 The doctrine of six essential factors (Asbabe sitta zooriya):

According to Unani medicine, health is defined

as a state of the body with humours in equilibrium and body functions normal. Health is made up of six essential elements: 1. Air 2. Drinks and food 3. Sleep and wakefulness 4. Excretion and retention 5. Physical activity and repose 6. Mental activity and repose [24]. This proposition bears some resemblance to the widely recognized definition of health, which is a state of mental, physical, and social well-being. The Unani system of medicine addresses homeostasis of the body, which depends on the balance of the four humours and disturbance in six essential factors such as atmospheric air, diet, sleep and wakefulness, removal and retention, mobility, and psychological condition will become a cause of the disease. Understanding these convictions to find the cause is the key to treatment. Therefore, practical science is based on the fundamental principles rooted in the oldest classical texts of Unani medicine [21].

Hippocrates categorized the humours into four groups grounded on their colour. They are known in Unani practice as dam (Blood), balgham (phlegm), safra (Yellow bile), and sauda (Black bile). The human composition corresponds to these humours: sanguine (damwi), phlegmatic (balghami), choleric (safrawi), and melancholic (saudawi). Every person is considered to have an individual humoral makeup, which is determined by the prevalence of a humour appropriate for him or her.

Disturbance in the quality and quantity of the humours is considered to produce pathological changes due to morbid humour leading to the development of an ailment. Once a deranged humour is identified, correction through regimenal therapy, dietary therapy, or pharmacotherapy will help in the maintenance of humour homeostasis, *viz.* health [25].

2.2 Basic principle of treatment (Usool-e-Ilaj)

According to the Unani System of Medicine, pathological changes in an organ are caused substantially by derangement in the temperament and quantity of humours which leads to the collection of mawad-e-fasida (Morbid material). Thus, therapeutic measures aim at, restoring the equilibrium of colourful elements by neutralizing the effect of pathological temperament being at the time of disease with medications and diet, endorsed with Ilaj bit tadbeer (Regimenal therapy) and after that removal of raddi akhlat (Morbid humours) by istafragh (Evacuation) from the body. This helps restore the normal homeostasis of humours [26].

2.3 Modes of therapies in Unani medicine

These 4 modes of treating an ailment are available in the Unani system of medicine.

Ilaj-bil-Tadabeer (Regimenal therapy)

Ilaj-bilGhiza/ Ilaj bi'l-Taghziya (Dietotherapy)

Ilaj-bil-Dawa (Pharmacotherapy)

Ilaj-bil-Yad (Surgery) [27, 28]

According to Unani philosophers Abu Sahal Masihi, Rabban-Tabri and Ibn-e- Sina, four types of naturally occurring edible things exist:

Ghiza (Food)

Dawa (Drug): a compound

Ghiza-e-Dawai (Food cum drug):

Dawa-e-Ghizai (Drug cum food)

2.4 Principles of Dietotherapy (Ilaj bi'l-Ghiza)

In Unani medicine Diet (Ghiza) is considered a two-sword, helps in maintaining health and redundant or bad quality is a

seed to disease [27].

The simplest and most natural course of treatment recommended by a hakim is diet therapy (Ilaj bi'l-Ghiza), which involves suggesting a particular diet. Before receiving medication, Unani physicians have advised patients to restrict or modify their daily diet. This should be performed based on the individual's condition and may need to be delayed for a few days, as certain conditions can be healed through diet alone. Therefore, particular/precise diets are advised according to disease. Initially, the treatment of various diseases has been tried through changing dietary patterns or the quality or quantity of food [6].

In the case of chronic diseases, Unani scholars have advised the administration of a nutritious proteinaceous diet in good quantity to serve wear and tear (Badan-e-ma-yatehul) caused by disease and maintaining the tabiat (immunity) to fight diseases over a long period [29].

Ghiza and Ghiza-e-Dawai include cereals, fruits, vegetables, eggs, flesh/meat, sugar, and honey. While Dawa and Dawa-e-Ghizai include different plant parts, herbal, animal, and mineral items including horns, teeth, liver, brain, fat, blood, glands and wags of animals and birds and Zavi-al-ajsad (Zinc, gold, silver, Iron, copper), Zavi-al-arwah (sulphur, mercury, arsenic), Hajaryat (Diamond, jad, sapphire) and Araziaat (gil-e-makhtoom, gil-e-armani, gil-e-multani) from mineral origin. Ghiza and Ghiza-e-Dawai are used to maintain physical and mental health, while Dawa and Dawa-e-Ghizai are applied to treat the diseases, not purely by supplying nutrition but also by combating the disease either by their act on the micro-some enzyme systems of the body or microorganism directly. Principally, Ghiza and Ghiza-e-Dawai nourish the body and ultimately increase its resistance to protect the body from disease [30].

Unani physicians have been treating diabetes mellitus since ancient times. They use several unani drugs both mufradat and murakkabat and diet for the prevalence of diabetes mellitus [31].

3. Prevention and Management of Diabetes

Over the last few decades, evidence from prospective observational studies and clinical trials has converged to support the importance of individual nutrients, foods, and dietary patterns in the prevention and management of type 2 diabetes. The quality of salutary fats and carbohydrates is more important than the volume of these macronutrients. Diets rich in whole grains, fruits, vegetables, legumes, and nuts, moderate in alcohol consumption, and lower in refined grains, red/ processed flesh, and sugar-enhanced potables have been demonstrated to reduce diabetes threat and enhance glycemic control and blood lipids in patients with diabetes. Several healthy dietary patterns emphasizing overall diet quality can be acclimated to applicable particular and artistic food preferences and calorie needs for weight control and diabetes prevention and management [32, 33].

3.1 Dietary Compounds in Unani for Managing Diabetes

Natural products have hypoglycemic potential that acts through either insulin-mimetic or secretagogues properties also hypoglycemic activity of the plants is mainly due to their ability to restore the function of pancreatic tissue by causing an increase in insulin output or inhibit the intestinal absorption of glucose or to the facilitation of metabolites in insulin-dependent processes. However, searching for new

hypoglycemic drugs from natural sources is still attractive, because they contain biomolecules that demonstrate alternative and safe effects on diabetes, out of these some murakkabat (Compound formulations) and mufradat (Single drugs) have been used from ancient times and described in our classical text.

3.2 Few single drugs with phytoconstituents and anti-hyperglycemic effects are indicated for diabetes Mellitus in the Unani system of Medicine

The main focus of the review is related to about pharmacological studies performed as anti-hyperglycemia exertion of the Indigenous shops material (Described in unani drug) and effective bioactive factors related to the stimulation of β -cells of the pancreas or its product and its action [34].

3.4 Tukhm-e-Karela (*Momordica charantia*): The search for novel hypoglycemic activities derived from natural sources remains appealing due to the presence of biomolecules, such as Tukhm e Karela (*Momordica charantia*), that exhibit safe and alternative effects on diabetes. Water-soluble fruit extract from *M. charantia* significantly lowers blood glucose levels in patients with NIDDM, according to a clinical trial. Without raising serum insulin levels, fried karela fruits taken as a daily dietary supplement decrease the modest but notable improvement in glucose tolerance in diabetes mellitus [35]. Its anti-diabetic qualities have made it extremely well-liked. Additionally, it has a lot of micronutrients, which are necessary to prevent diabetic complications [36].

3.4 Tukhm-e-Meethi (*Trigonella Foenum gracium*): Fenugreek seeds are widely available in India and are frequently one of the primary ingredients in Indian spices. 4-hydroxyisoleucine, a novel amino acid from fenugreek seeds, improved isolated islet cell release of insulin in both rats and humans. Additionally, fenugreek seeds enhanced the metabolism of glucose and restored normal creatinine kinase activity in the liver, heart, and skeletal muscle of diabetic rats. Additionally, it decreased the activity of fructose 1, 6-biphosphatase and liver and renal glucose-6-phosphatase. Additionally, this plant exhibits antioxidant activity [37].

3.5 Gurmar Booti (*Gymnema sylvestre*): *Gymnema sylvestre* is one plant that is thought to have potent anti-diabetic properties. *G. sylvestre* leaves that are soluble in water cause the pancreatic β -cells to regenerate both *in vitro* and *in vivo*, releasing insulin [38].

Giloy (Tinospora cordifolia): *Tinospora cordifolia* is widely used in Indian Unani/ Ayurvedic medicine for treating diabetes mellitus [39].

3.6 Tukhm-e-Jamun (*Eugenia jambolana/Syzygium cumini*/Indian gooseberry)

Eugenia jambolana kernel decoction is a common home treatment for diabetes. This also makes up a significant portion of several herbal diabetes formulas used in Unani medicine. Aqueous extract and powder both have an antihyperglycemic action, lowering blood sugar levels. In contrast to the seed of the same fruit, the extract from jamun pulp demonstrated hypoglycemic action in diabetic rats after 30 minutes of dosing. The oral administration of the extract resulted in an increase in serum insulin levels in diabetic

rats [40].

3.7 Kalonji (*Nigella sativa*): Extracts from *N. sativa* seeds improve the release of insulin induced by glucose in rat-isolated Langerhans islets [41], *N. sativa* supplementation at a dose of 2 gm/day for 12 weeks may improve dyslipidemia associated with type 2 diabetic patients [42], The petroleum ether extract of *N. sativa* exerts lipid-lowering and insulin-sensitizing actions in the rat [43], immunomodulatory activity, (44) *N. sativa* decoction given by intragastric lavage for 9 months was able to correct diabetes and obesity in desert gerbil *Meriones shawi* [45].

3.8 Tukhm-e-Kahu (*Lactuca sativa*): Decoction of *L. sativa* decrease in the intestinal glucose absorption and shows a hypoglycemic effect [46]. Methanolic leaf extract of *L. sativa* shows significant antioxidant potential both *in vitro* and *in vivo*. [14] *L. sativa* is capable of protecting neurons against glucose/serum deprivation-induced cell injury, an *in vitro* model of brain ischemia. *L. sativa* exerts neuro-protection and has the potential to be used as a new therapeutic strategy for common neurodegenerative disorders such as stroke [48] Tahlab (*Spirulina platensis*) *Spirulina* shows a hypoglycemic effect on noninsulin-dependent diabetic mellitus [49-51].

3.9 Dammul-akhwain (*Pterocarpus marsupium*)

Commonly referred to as vijasar or Indian kino, dammul-akhwain contains a variety of chemical components, including epicatechin, pterostilbene, and marsupin. Epicatechin, the active ingredient, has been shown to be insulinogenic, which increases the release of insulin and the conversion of proinsulin to insulin [52].

4. Conclusion

The role of Unani (Traditional) Medicine in the management of Diabetes is being appreciated on account of a better understanding of the mechanism of action of such drugs. Unani physicians have been treating Diabetes Mellitus since ancient times; they have described many Unani drugs/herbs both single and compound for the management of Diabetes Mellitus. Recently several single herbal drugs mentioned in classical Unani literature have been experimentally and clinically evaluated and reported as hypoglycaemic agents. A few theories concern their impact on the function of pancreatic β -cells, a rise in the inhibitory effect against the enzyme insulinase, an improvement in insulin sensitivity, or the ability of plant extracts to act like the effects of insulin. However, the scientific study of compound formulation is largely ignored by scientists and physicians despite the fact.

5. Conflict of Interest: Not available.

6. Financial Support: Not available.

7. References

- Mukhtar Y, *et al.* Moderate overview on Diabetes mellitus: A chronic endocrine disorder. *Eur. J Biol.* 2020;5(2):1-12.
- Ghosh A, *et al.* Effects of nationwide lockdown during COVID-19 epidemic on lifestyle and other medical issues of patients with type 2 diabetes in north India. *Diabetes Metab Syndr Clin Res Rev.* 2020;14:917-920.

3. Abdul Azeez R, Hafeel MHM. Case Report: Type 2 Diabetes Mellitus (Ziabetus shakari). *Sch. Int. J Tradit. Complement Med.* 2021;4(7):136-138.
4. Murugesh S, Dhandayuthapani M. A Brief Overview of Diabetes. *Int. J Pharm. Pharm. Sci.*, 2011, 3(4).
5. Fujinami RS, Herrath VMG, Christen U, Whitton JL. Molecular Mimicry, Bystander Activation, or Viral Persistence: Infections and Autoimmune Disease. *Clin Microbiol Rev.* 2006;19:80-94. DOI: 10.1128/CMR.19.1.80-94.2006.
6. Permutt MA, Wasson J, Cox N. Genetic Epidemiology of Diabetes. *J Clin. Invest.* 2005;115:1431-1439.
7. Diabetes.co.in. Gestational Diabetes. Available from: <http://diabetes.co.in/gestational-diabetes>.
8. Indian Council of Medical Research (ICMR). Assessment of Burden of NCDs. New Delhi: ICMR; c2006.
9. Wild S, Roglic G, Green A, Sicree R, King H. Global Prevalence of Diabetes. *Diabetes Care.* 2009;27:1047-1053.
10. Nam S, Chesla C, Stotts NA, *et al.* Barriers to diabetes management: Patient and provider factors. *Diabetes Res Clin. Pract.* 2011;93:1-9.
11. Fonseca VA. Section of Endocrinology, Tulane University Medical Center, 1439 Tulane Avenue, SL 53, New Orleans, LA 70112.
12. Izharul H. Unani Medicine's Insights: Navigating Challenges and Opportunities in Diabetes Management. *J Pharma Ayurved Res.* 2023;3(2):2582-8428.
13. Waseem A, Siddiqui MK, Siddiqui KM, Khan KZ. Ziabetus-Ek Tarikhi Jayeza. *Jahan-e-Tibb.* 2008;9(4):55-60.
14. Usaiba IA. Uyoon Al-Anba Fi Tabaqat Al-Attiba. New Delhi: CCRUM; c1990. p. 347-367.
15. Khan A. Al-Ikseer. M Siddique, trans. Rawalpindi: Tibbi Company; c2004. p. 1195-1197.
16. Baghdadi IH. Kitab Al-Mukhtatat Fil-Tibb. New Delhi: CCRUM; c2004. p. 326-327.
17. Ibn Sina. Al Qanoon Fil-Tibb. G H Kinturi, trans. Lahore: Book Printers; c1992. p. 201-202.
18. Jurjani AH. Zakhira Khwar-zam Shahi. H H Khan, trans. Lucknow: Munshi Nawal Kishore; c1903. p. 23-24, 30, 171, 540-541.
19. Rushd I. Kitab Al-Kulliyat. New Delhi: CCRUM; c1980. 1st ed. p. 54, 55, 87, 88, 89, 112, 146, 149.
20. Haider A, *et al.* Diabetes in Context of Unani System of Medicine: A Review Study. *World J Pharm Res.* 2018;7(17):627-637. ISSN: 2277-7105.
21. Faiz A, *et al.* Holistic Approach in Unani System of Medicine with Respect to Pheg, Humours and Six Essential Factors. *JETIR*, 2018, 5(3).
22. Kabeeruddin AM. Tarjuma wa Shrah Kulliyate Nafeesi. New Delhi: Idare Kitabul Shifa; c2009. p. 424-427.
23. Shabnam A, *et al.* Fundamentals of Unani System of Medicine: A Review. *Eur. J Biomed Pharm Sci.* 2018;4(9):219-223. ISSN: 2349-8870.
24. WHO. Unani medicine. 2013. Available from: <http://apps.who.int/medicinedocs/documents/s17558en/s17558en.pdf>.
25. Maruf K. Implication of Leech Therapy and Asbab-e-Sitta Zarooriyah in the Prevention and Treatment of Varicose Veins: A Comprehensive Review. *Int. J Adv. Res.* 2020;12(02):627-632. ISSN: 2320-5407.
26. Kabeeruddin AM. Tarjuma wa Shrah Kulliyate Nafeesi. New Delhi: Idare Kitabul Shifa; c2009. p. 424-427.
27. Azam Khan H. Al-Akseer Azam. H Kabiruddin, trans. New Delhi: Aijaz Publishing; c2010. p. 15-25, 40-95.
28. Hamadani KH. Usoole-Tibb. New Delhi: Komi Council Baraye Farg Urdu Zaban; c2001. p. 400-80.
29. Nigrami H. Tarike Tibb. New Delhi: Komi Council Baraye Farg Urdu Zaban; c2009. p. 345-50.
30. Azmi AA. Basic Concepts of Unani Medicine. New Delhi: Jamia Hamdard; c1995. p. 135-136.
31. Kabiruddin Hakim. Tarjuma-e Kabeer. 3rd vol. p. 27-36.
32. Khalik A. Clinical Study of Ziabetus Shakari (DM Type 2) and Comparative Evaluation of Unani Formulation (Maghz Tukhm-e-Jamun wa Tukhm-e-Hayat) and Metformin in its Management. Department of Moalijat, Faculty of Unani Medicine, AMU, Aligarh; c2016.
33. Heidemann C, Hoffmann K, Spranger J, *et al.* A dietary pattern protective against type 2 diabetes in the European Prospective Investigation into Cancer and Nutrition (EPIC)-Potsdam Study cohort. *Diabetologia.* 2005;48(6):1126-1134.
34. Imamura F, Lichtenstein AH, Dallal GE, Meigs JB, Jacques PF. Generalizability of dietary patterns associated with incidence of type 2 diabetes mellitus. *Am J Clin. Nutr.* 2009;90(4):1075-1083.
35. Saxena A, Vikram NK. Role of selected Indian plants in management of type 2 diabetes: A review. *J Altern Complement Med.* 2004;10(2):369-378.
36. Leatherdale BA, *et al.* Improvement in glucose tolerance due to *Momordica charantia* (karela). *Br Med J.* 1981;282(6279):1823-1824.
37. Ansari K. Diabetes and Unani Herbal Medicine: A Review. *J Med Plants Stud.* 2017;5(2):361-363.
38. Gaonkar VP, Hullatti K. Indian Traditional Medicinal Plants as a Source of Potent Anti-diabetic Agents: A Review. *J Diabetes Metab Disord.* 2020;19(2):1895-1908. DOI: 10.1007/s40200-020-00628-8.
39. Kanetkar P, Singhal R, Kamat M. *Gymnema sylvestre*: A Memoir. *J Clin. Biochem Nutr.* 2007;41(2):77-81. DOI: 10.3164/jcbn.2007010.
40. Stanley P, Prince M, Menon VP. Hypoglycaemic and other related actions of *Tinospora cordifolia* roots in alloxan-induced diabetic rats. *J Ethnopharmacol.* 2000;70(1):9-15. DOI: 10.1016/s0378-8741(99)00136-1.
41. Acherekar S, Kaklij GS, Kelkar SM. Hypoglycemic activity of *Eugenia jambolana* and *Ficus bengalensis*: Mechanism of action. *In vivo.* 1991;5:143-147.
42. Rchid H, *et al.* *Nigella sativa* seed extracts enhance glucose-induced insulin release from rat-isolated Langerhans islets. *Fund Clin Pharmacol.* 2004;18(5):525-529.
43. Kaatabi H, *et al.* Favorable impact of *Nigella sativa* seeds on lipid profile in type 2 diabetic patients. *J Fam Community Med.* 2012;19(3):155-161.
44. Phuong Mai Le *et al.* The petroleum ether extract of *Nigella sativa* exerts lipid-lowering and insulin-sensitizing actions in the rat. *J Ethnopharmacol.* 2004;94(2-3):251-259.
45. Swamy SM, Tan BK. Cytotoxic and immunomodulatory effects of ethanolic extract of *Nigella sativa* L. seeds. *J Ethnopharmacol.* 2000;70:1-7.
46. Labhal A *et al.* Propriétés antidiabétiques des graines de *Nigella sativa* chez le Meriones shawi obèse et

- diabétique. *Espérance Médicale*. 1999;47:72-74.
47. Roman RR, Flores S-JL, Alarcon AFJ. Anti-hyperglycaemic effect of some edible plants. *J Ethnopharmacol*. 1995;48:25-32.
 48. Garg M, Garg C, Mukherjee PK, Suresh B. Antioxidant potential of *Lactuca sativa*. *Anc Sci Life*, 2004, 24(1).
 49. Sadeghnia HR, Farahmand SK, Asadpour E, Rakhshandeh H, Ghorbani A. Neuroprotective effect of *Lactuca sativa* on glucose/serum deprivation-induced cell death. *Afr. J Pharm Pharmacol*. 2012;6(33):2464-2471.
 50. Mani UV, Desai S, Iyer UM. Studies on the long-term effect of Spirulina supplementation on serum lipid profile and glycated proteins in NIDDM patients. *J Nutra Funct Med Foods*. 2000;2:25-32.
 51. Lee EH, Eun JP, Ju YC, KapBum H, Wha-Young K. A randomized study to establish the effects of Spirulina in type 2 diabetes mellitus patients. *Nutr Res Pract*. 2008;2(4):295-300.
 52. Kaur K, Sachdeva R, Grover K. Effect of supplementation of Spirulina on blood glucose and lipid profile of non-insulin dependent diabetic male subjects. *J Dairying Foods & H.S*. 2008;27(3/4):202-208.
 53. Modak M. Indian herbs and herbal drugs used for the treatment of diabetes. *J Clin. Biochem. Nutr*. 2007;40(3):163-173.

How to Cite This Article

Ismail M, Ahmad I, Hasan SA, Ali M, Anas M. Dietary patterns in unani medicine: An integrative approach for managing diabetes mellitus: A comprehensive review. *International Journal of Unani and Integrative Medicine*. 2024;8(3):29-34.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.