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Traditional Iranian Medicine Approaches to Heatstroke: Insights for Mitigating Health Challenges in a Warming World

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Abstract

The Middle East and the Iranian Plateau's location in a hot and arid climate has led classical Iranian medical texts to pay special attention to the impact of environmental factors, such as heat, on human health, often referred to as “heatstroke.” Findings from research in Iranian medical texts reveal that the nature of the issue is classified within the framework of the humoral theory of Hippocratic medicine, where heat is considered one of the most significant environmental factors causing various bodily injuries and functional disorders. In this context, maintaining balance and preserving the body's health were closely linked to the recommendations of classical Iranian physicians regarding preparing and normalizing the body's adaptation to heat and its associated complications. This research employs a library-based methodology, drawing on traditional medicine and environmental geography. It critically examines and analyzes the content of Iranian medical texts to address environmental heat as an external threat to health, focusing on maintaining balance and the therapeutic methods proposed by Iranian traditional physicians. The study is descriptive in nature and relies on classical Iranian medical texts to explore, identify, and introduce strategies for combating heat-related health challenges. Given the increasing global temperatures in recent years and the associated challenges, familiarity with the insights of prominent past physicians on dealing with heat can be highly beneficial and practical. Thus, this study aims to provide a comprehensive analysis of Iranian medical texts, offering methods to maintain health and appropriate treatments for heat-related conditions.

Keywords: Heatstroke, Disease, Iranian Physicians, Iranian Medical Texts, Travel Medicine, Iran.

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Introduction

The human body is the primary asset of every individual, defining material existence. Measures to maintain health, identify causes of diseases, and various therapeutic approaches are recognizable and explainable within the medical framework of each era. Before the advent of modern medicine, Iranian physicians operated within the epistemological framework of the four humors. Disease-causing factors in this system were primarily categorized into internal and external factors. Internal factors related to changes within the body and the imbalance of humors, while external factors included environmental conditions such as temperature (heat/cold) and unforeseen events like trauma or falls. Neglecting environmental factors, such as air temperature, could disrupt thermal balance and lead to conditions like heatstroke or hypothermia.[1,2]

Hyperthermia, the most dangerous effect of heat on the human body, occurs when the body's thermoregulatory mechanisms fail, causing body temperature to rise to around 40°C, which the body cannot dissipate. Heatstroke was more common during summer, especially during travel for pilgrimage, trade, or military campaigns.[3,4] Given that negligence toward heat could have irreversible consequences on health, livelihood, and social life, this study aims to identify and

explain the health measures and therapeutic methods proposed by prominent Iranian physicians during the Islamic period to combat environmental heat.

Regarding the research background, few Persian-language articles have briefly touched on some aspects of this study. For example, the article "Geographical distribution and how to deal with the Samum wind in the history of Iran during the Islamic period" examines the history and methods of coping with the Samum wind in Islamic Iran, sharing some similarities with this study.[5] The article "Traveler hygiene measures in Safavid Iran" briefly mentions maintaining traveler health during heat.[6] Another article, "Health Protection Measures in Safavid Iran," briefly discusses health measures during hot weather.[7] The article "The role of air in maintaining health; Perspectives of Persian Medicine" explores the negative effects of air pollution on the human body and ways to combat it.[8] Among international articles, "Therapeutic potential of traditional Chinese medicine on heat stroke" introduces traditional Chinese medicine treatments for heatstroke,[2] while "Unusual heat stroke caused by herbal therapy with traditional Chinese medicine" discusses herbal treatments for heatstroke in Chinese medicine.[9] The article "Public health approach of Unani medicine to cope and stay safe in hot environmental conditions" evaluates effective therapeutic or preventive measures against heat-related illnesses in Unani medicine.[10]

None of these studies specifically address how to combat heat. Therefore, this research seeks to answer the question: What preventive and therapeutic measures did the Iranian medical system propose to address environmental heat and heatstroke?

Methodology

The methodology of this research is library-based and relies on traditional medicine and environmental geography. It critically examines and analyzes the content of Iranian medical texts to address environmental heat as an external threat to health, focusing on maintaining balance and therapeutic methods proposed by Iranian traditional physicians. The research is descriptive and relies on classical Iranian medical texts.

The research process includes the following steps:

A) Thorough examination and study of classical Iranian medical texts and discussions on the geography and climate of Iran's hot and arid regions, referencing both English and Persian sources. B) Note-taking on materials relevant to the research topic. C) Systematic organization of notes for optimal use and analysis. D) Final drafting and writing of the research.

Results

The Role of Iran's Climate and Geography in Studying Heatstroke:

One of the areas emphasized by traditional Iranian physicians and authors of classical Iranian medical texts is heatstroke, a condition specific to the hot and arid climate of Iran and various regions of the Middle East. Key characteristics of this climate include subtropical zones, which feature hot winds, extremely dry air, and intense, direct sunlight. The skies in these regions are often cloudless for most of the year. However, in the afternoons, due to the heating and movement of air layers near the ground, fog and dust storms can occur. Humidity is low, and the absence of clouds leads to significant temperature fluctuations. In summer, daytime sunlight can heat the ground surface to up to 17°C, while nighttime temperatures in some desert areas can drop to -31°C. Winters are harsh and cold, while summers are hot and dry. This climate can be divided into two regions: semi-desert and desert. The semi-desert region includes the slopes and foothills of the northern, western, and southern highlands of Iran, as well as Mesopotamia and the Arabian Peninsula, which benefit somewhat from moist winds passing over them. However, as one moves from west to east, the influence of moist winds decreases, and the air becomes drier. The desert region encompasses the low-lying central, eastern, and southeastern basins of Iran. Key features of this climate include significant temperature differences between summer and winter, as well as large diurnal temperature variations in summer.[11] (Figure 1).

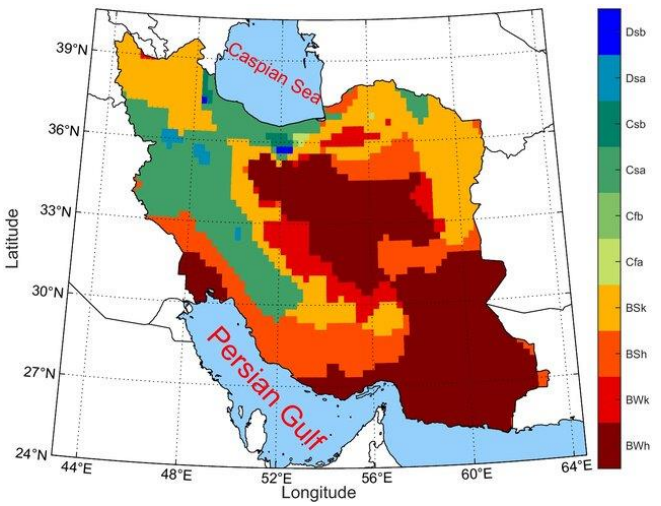

Figure 1. Hot and dry climate areas on the Middle East map of Iran.[12]

The Impact of Hot Air on Bodily Functions:

Iranian physicians, operating within the framework of the Hippocratic humoral system (theoretical/practical), presented their theories. In the theoretical section, under

"Natural Affairs," they provided essential knowledge about the origin, normal functioning, and changes in the body, the nature of health and disease, factors influencing health preservation, the onset of diseases, and the recognition of disease symptoms. In the practical section, Iranian physicians focused first on preserving health and second on restoring lost health during illness. In the humoral approach, health preservation was achieved through six preventive measures related to "air, food/drink, movement/rest, sleep/wakefulness, evacuation/retention, and mental states." In the second step, if illness occurred, various therapeutic methods, often based on the principle of "treating with opposites," were employed. The goal of health preservation and therapeutic methods was to maintain or restore balance to the body's temperament and humors. In the health preservation strategies proposed by Iranian physicians, the first essential element was air. Since the body is always surrounded by air, maintaining thermal balance played a crucial role in preserving health. According to Iranian physicians, the body's constitution depended on the three natural, animal, and apperception, whose functions were mediated by the spirit. In this chain, the qualitative balance of air, as the material and nourishment of the spirit, played a vital role in preserving and restoring health. Inhaling air balanced in temperature (hot/cold) and humidity (moist/dry) soothed the heart's heat and expelled waste materials from the spirits. Conversely, any imbalance in the air caused various complications, such as corruption of the spirit, cardiac imbalance, and subsequent corruption of the temperament of all bodily organs. Excess heat/moisture led to putrefaction, while excess heat/dryness caused burning and increased the density of bodily humors.[13-20]

It is worth noting that breathing air has two important functions. On the one hand, inhalation supplies the body with necessary oxygen, and on the other, exhalation removes waste materials. To combat and alleviate the effects of hot air on the human body, Iranian physicians proposed various health preservation measures and therapeutic methods, which will be discussed further. Qualitatively, moderate heat stretched the blood vessels, causing facial redness and benefiting individuals with cold temperaments or cold-related diseases. However, excessive heat disrupted the body's thermoregulatory mechanisms, leading to various complications and functional disorders in bodily organs. According to Iranian physicians, prolonged exposure to sunlight and inhaling hot air increased sweating, depleted bodily moisture, caused putrefaction of humors, led to bodily weakness, increased bile, thickened and closed skin pores, reduced appetite, and caused weight loss.[13-25]

A significant relationship exists between air temperature and the onset, alleviation, treatment, or reduced prevalence of certain diseases. According to Iranian physicians, if summer maintained its natural moderate heat, diseases were rare that year. If summer resembled spring in temperament, fevers were less severe, and crises often manifested as sweating or nosebleeds. Qualitatively, if the summer air was excessively hot/dry, diseases were sharper and shorter in duration. Excess heat/moisture in the air increased putrefaction, leading to prolonged fevers, internal and external inflammations, and various eye pains. Cholera and smallpox were more likely in hot/moist summers, while typhoid was more common in hot/dry summers. In terms of treatment duration, diseases were cured more quickly in summer. Recovery and treatment were closely related to the patient's strength. If the patient was strong, the heat aided the body in overcoming the disease. However, if the patient was weak, the heat caused severe depletion and ultimately death.[14, 17, 18, 22, 26]

Caution was necessary when using therapeutic methods during heat. Attention to environmental temperature and season was crucial when performing bloodletting or using purgatives. Generally, body cleansing through bloodletting and purgatives was recommended in spring and autumn. If cleansing was necessary in hot seasons, induced vomiting was advised. Bloodletting was discouraged in hot seasons and regions due to the increased fluidity of waste materials in the body. If bloodletting was necessary, precautions were essential to prevent complications. Similarly, the use of purgatives for body cleansing in hot seasons was discouraged for the general population, especially thin individuals, due to excessive moisture loss. In emergencies, physicians cautiously prescribed purgatives, considering the season and the patient's condition. Given the impact of heat on health, protecting the body from temperature changes in various ways and adhering to health preservation recommendations were essential. Some recommendations focused on the surrounding environment, such as housing and living spaces, while others emphasized protecting the body from heat, adapting to seasonal temperatures, or safeguarding the body during activities like travel.[13, 16, 17, 21, 27].

Discussion

Measures to Combat Heat:

Selection of Dwelling, Habit Adjustment, and Body Cleansing:

One of the most important recommendations by Iranian physicians was to consider thermal comfort and temperature when choosing a dwelling or campsite. It was

advised that during summer, individuals should reside in shaded, cool areas for greater comfort. To reduce the temperature of the dwelling, the use of ice was recommended, and to freshen the air, the application of cool fragrances such as Elymus repens, Ipomoea tricolor, rose water, sandalwood, and camphor was suggested.[14,16,18,27]

To prevent air contamination, certain architectural principles were essential. Houses were recommended to have high ceilings and large east-facing openings to allow morning sunlight to freshen the air. In case of contamination, air circulation was necessary to remove impurities and improve health.[16-18]

Additionally, selecting an appropriate campsite for military operations during heat was crucial. Neglecting this could lead to health issues. It was advised that during summer, camps should be set up on elevated ground, with tents spaced apart and facing the north wind.[13,21] Adapting the body to seasonal temperatures or adjusting to temperature changes during travel was essential for maintaining health. Given the role of excessive heat in exacerbating bodily disorders, gradual acclimatization to heat was necessary to minimize harm. It was recommended to avoid prolonged exposure to the sun, excessive physical exertion, and exhausting the body during summer.[13,16,21,23,25-28]

Preparing and cleansing the body before traveling in heat was crucial. Despite the general prohibition of bloodletting and purgatives during hot seasons, travelers were advised to cleanse their bodies through bloodletting and purgatives to prevent imbalances in bodily humors and the onset of swelling or illness during the journey. Alongside cleansing, travelers were encouraged to adjust their habits to prepare for the journey, such as increasing physical activity, practicing walking or horseback riding, adapting dietary habits, reducing sleep, and acclimating to warm environments and sunlight.[13,17-19,23,24] These adjustments were vital for maintaining health and preventing complications during travel.

Functional Food Recommendations in Heat

A significant portion of the recommendations by Iranian physicians for maintaining health in heat focused on dietary and beverage guidelines. Certain dietary restrictions were essential for preserving health. Avoiding foods with hot/dry temperaments, such as sweet, fatty, spicy, and salty foods, as well as overeating and mixing incompatible foods, was crucial during heat. Neglecting these restrictions could lead to digestive issues, increased waste materials, and bodily heaviness.[13,18,22]

In line with the preventive and "treat with opposites" approach of the humoral system, it was recommended to consume light, balanced, or cold/moist foods in small portions during summer. Beneficial foods included those made from barley, green beans, squash, boiled foods with vinegar, beef cooked in vinegar, chicken marinated in barley flour, soft-boiled eggs, onions soaked in vinegar/yogurt/whey, and dishes like cooked purslane with yogurt and oil. Additionally, water-rich and sour/astringent fruits such as melons, cucumbers, plums, peaches, grapes, apples, pears, pomegranates, sour grapes/dates, sorrel, sumac, lettuce, chicory, purslane, poppy seeds, and vinegar were recommended.[13,17,18,21] The goal of consuming cold/moist foods was to increase bodily moisture, counteract excessive heat and dryness, and prevent the dominance of bile in the body.

Maintaining health during travel in heat was closely tied to adhering to dietary and beverage recommendations. To prevent complications, travelers were advised to gradually reduce food intake and acclimate to hunger and thirst several days before the journey. Adapting to small portions of high-quality, nutritious, and dense foods, such as roasted liver in fat, almonds, almond oil, and beef fat, helped endure hunger during travel. Timing meals and drinks to coincide with rest periods was also important.[17,18]

Traveling on an empty or full stomach was discouraged. An empty stomach, especially in thin individuals, increased the risk of weakness and bodily depletion, while a full stomach could cause shortness of breath, swelling, and abscesses. Drinking large amounts of water before travel was also discouraged due to the risk of bloating. Eating and drinking during travel were to be minimized, with only small amounts consumed if necessary.[13,18,19,21,23,24]

The body's need for water varied based on environmental conditions. Exposure to sun, wind, and heat, especially during travel, increased sweating and thirst. To prevent severe dehydration, which could be fatal, traveling during the cool morning or evening hours was recommended.[13,15,16,20] Wearing appropriate clothing, avoiding rapid movement, excessive talking, and moving slowly were also important in preventing thirst.[13,17,18] Placing a tablet made from cucumber, squash, lettuce, and purslane seeds, along with sweet licorice extract, pomegranate seeds, dried plums, or tamarind in the mouth was beneficial in preventing thirst. In case of exposure to toxins, cold/moist beverages such as "mucilage of quince seeds with rose oil and vinegar," "purslane seed paste with vinegar," "vinegar with water," "purslane seed extract with pomegranate juice," and syrups made from *Nymphaea alba*, apple, sour grape, and barley flour with or without sugar were recommended to quench thirst.[17,18,21-24,29]

Protecting Various Body Parts from Heat and Heatstroke

Skin, Eyes, Ears, and Nose

The skin, as the most exposed organ, is constantly at risk from environmental factors such as heat and intense sunlight. Given that past travel often occurred overland during hot seasons, Iranian physicians proposed preventive measures and treatments for various skin injuries. To prevent sunburn during unavoidable daytime travel, it was recommended to protect the skin with appropriate clothing to shield it from direct sunlight and hot winds. One of the most important preventive measures was applying a protective layer, known as Gold (a medicinal lotion), to the skin before exposure to heat and sunlight. Beneficial lotion formulations for preserving skin tone included mucilages made from quince seeds, psyllium, purslane leaves, tragacanth gum (alone or combined with gum arabic and starch), tragacanth with egg white, egg white alone, and bread soaked in water. Additionally, massaging the skin with cold/moist oils such as violet/lotus oil and applying a mixture of sesame oil, tragacanth mucilage, and psyllium was recommended to treat skin cracks.[13, 17, 18, 21, 30]

In case of skin damage, to restore pallor, it was advised to apply a mixture of chicken fat or breast milk to the skin at night and wash it off in the morning with hot water and chickpea flour. Nighttime applications of pastes made from starch, tragacanth, and milk-soaked radish seeds or a combination of peeled sweet almonds, starch, and tragacanth were also beneficial.[13, 22, 24] To restore skin brightness, softness, and smoothness, various gums such as tragacanth, wheat starch, ladanum, frankincense, figs, lily roots, litharge, Venetian ceruse, powdered ivory, decayed bone, gelatin sheets, cooked shellfish, fenugreek, and yellow sweet clover were usedas lotions. For washing, flours made from chickpeas, barley, unripe wheat, peeled broad beans, lentils, sweet almonds, black seeds, radish seeds, melon seeds, and squash seeds were recommended.[18, 24]

Excessive heat, sweating, and inadequate washing could lead to small, red, burning rashes known as hasf or khoshk rande. To treat these rashes, bloodletting and purgatives like *Terminalia chebula* or *Fumaria officinalis* were recommended if blood dominance was suspected. Other treatments included applying lotions made from coriander water, vinegar, rose water, and flower oil; henna and vinegar; boiled myrtle water, vinegar, and rose water; salt, henna, and vinegar; or oak apple, turmeric, and flower oil mixed with rose water and vinegar. This was followed by bathing with chamomile, myrtle, barley bran, and barley flour.[18, 31]

The eyes, as one of the most sensitive organs, were prone to damage from sunlight and heat, such as vision impairment, conjunctivitis, inflammation, increased secretions, redness, cloudiness, eye pain, and night blindness. To prevent eye damage, it was essential to avoid direct sunlight, exposure to unbalanced air (hot/cold), and contact with wind, smoke, or dust. If damage occurred, removing the causative factor would alleviate the issue.[13, 18, 24, 32]

The most common eye condition caused by heat was dryness. Washing the eyes several times with cool, clear water was recommended to increase moisture and remove foreign particles. Certain medicinal formulations, such as specific surma (kohl) preparations, were used to prevent inflammation and pain.[22] In case of inflammation, resting in a dark room with closed eyes was advised. Cold-temperament drinks like violet, *Nymphaea alba*, poppy, and sour pomegranate syrups were beneficial. Avoiding prolonged staring, excessive talking, shouting, overeating, or fasting, as well as refraining from thick, salty, and spicy foods and drinks, was essential to reduce inflammation.[18]

If eye inflammation resulted from both heat and bodily waste, bloodletting from the qifal vein (a vein in the arm), cupping, and purgatives were recommended. To reduce pain and restore balance, herbal drops and ointments were used. A suppository made from egg white, breast milk, and fenugreek decoction could restore eye health within a day.[18] For external application, a mixture of opiate, hematite, starch, gum arabic, and Venetian ceruse was beneficial for treating heat-related eye conditions.[17] The ears and nose were also at risk from heat and heatstroke. It was recommended to cover them with cloth or a scarf to prevent exposure to dust and hot air.[16, 18, 19, 23]

Protecting the Body from the Samum Wind

Upon encountering the samum (a hot, dry wind), it was advised to immediately immerse oneself in water. If water was unavailable, one should distance themselves from the wind's path and avoid inhaling or being exposed to it. Covering the head with clothing and sealing the mouth and nose with a scarf or turban until the wind passed was essential for health. To prevent thirst, swishing water in the mouth and drinking it if cool, or sucking on water-rich plants like purslane leaves or cucumber, was recommended.[5, 14, 18, 19, 24]

If someone suffered extreme thirst due to the samum, they were advised against drinking large amounts of water at once to avoid sudden death. Washing the body with water was more beneficial than drinking it. Pouring a mixture of flower oil, willow water, and rose water over

the head helped reduce body heat and thirst. If drinking water was necessary, it should be mixed with flower oil, swished in the mouth, and consumed gradually.[14, 17, 18, 21, 22].

To alleviate dryness caused by the samum, massaging the soles of the feet, navel area, chest, abdomen, and muscles with violet or flower oil was beneficial. Applying almond, violet, squash seed, or willow oil inside the nose was also recommended. To complete the treatment, the affected person should rest in a cool, north-facing place for an extended period. Cold/moist foods and drinks, as well as inhaling the scents of sandalwood, camphor, and rose water, were advised to strengthen the body and reduce heat.[14, 17-24]

Other Heat-Related Diseases and Complications (Causes, Prevention, and Treatment)

Qashfi (Dehydration and Sunburn):

Excessive physical activity and prolonged exposure to sunlight and heat could lead to severe sweating, dehydration, sunburn, and a condition known as qashfi, characterized by a feeling of dryness and stiffness in the limbs. Various treatments aimed at restoring moisture to the body were recommended, tailored to the individual's age, physical strength, and complexion. The primary recommendation was a sitz bath ofcold water and then lukewarm water for three consecutive days. After three days, the person was advised to immerse themselves in cold water. Washing the body with decoctions of chamomile, marshmallow, mallow, and beet, or using soft acidic solutions and ash water, was considered beneficial. Another approach was massaging the body with oils such as violet, almond, chamomile, dill, seaweed, wild rue, cumin, and oils derived from *Ecballium elaterium*, marshmallow, and beet roots. To increase bodily moisture, consuming soft, moist foods and drinks like kashkab (a yogurt-based drink), psyllium mucilage, barley kashk, pumpkin stew, mung beans, spinach, chicken broth, soft-boiled eggs, and a mixture of almond oil and sugar was recommended.[18, 24, 26]

Bloody Diarrhea:

Traveling in extreme heat and enduring thirst, especially for individuals with hot temperaments or those who were thin, could lead to an imbalance of heat and dryness in the liver, causing the blood to thicken and resulting in bloody diarrhea. To counteract this, treatments aimed at increasing moisture and reducing body heat were recommended. Drinking ice water on an empty stomach with poppy syrup and kashkab, as well as using camphor and *Bambusa arundinacea* tablets, were advised. Importantly, diarrhea should not be stopped abruptly during treatment.[18]

Minor Jaundice:

Traveling in hot, dusty conditions could block skin pores and lead to minor jaundice. To treat this condition and open the pores, bathing with a decoction of common violet, *Melilotus officinalis*, chamomile, marshmallow, and bran was recommended.[33]

Sahar (Insomnia):

Traveling in heat combined with excessive sleep deprivation could reduce brain moisture, corrupt the temperament, deplete the spirit, weaken bodily faculties, and impair mental function, leading to a condition called sahar (insomnia). The affected individual, despite desiring sleep, would be unable to sleep. Treatments included applying oils of damask rose, common violet, pumpkin, almond, and poppy to the head and dripping them into the ears and nose, washing the head with a cold decoction of poppy and violet, bathing in lukewarm sweet water, inhaling pleasant fragrances, consuming light foods like pumpkin stew and beet, and applying cold-temperament lotions to the chest and liver.[16, 18, 22, 26]

Suda' (Headache):

The most significant consequence of exposure to intense heat on the brain was suda' (headache). Preventing this condition required avoiding direct sunlight and wind and keeping the head covered. Symptoms included a sensation of heat, lightheadedness, dry mouth, throat, and nose, excessive thirst, and a strong desire for cold water and water-rich fruits. Immediate treatment was emphasized, as neglect could lead to severe complications.[22- 24]

To alleviate symptoms, cooling substances with cold temperaments were prioritized. Placing a cloth soaked in vinegar or rose water on the forehead and frequently replacing it, inhaling the scents of rose water, vinegar, camphor, common violet, *Nymphaea alba*, and sandalwood, and sitting in warm water or water boiled with common violet and chamomile were recommended.[14, 24] Additionally, applying mixtures of *Nymphaea alba* oil and camphor, willow oil and hemlock extract, or dill oil and rose oil into the nose and ears was beneficial.[18, 22, 24]

Another approach was applying cerates and lotions to the head and forehead. Beneficial cerates included mixtures of willow, apple, purslane, damask rose, and fox grape leaves soaked in rose water, as well as poultices made from Melilotus officinalis and Chondrus crispus. lotions included white/red sandalwood mixed with coriander water, sandalwood, damask rose, saffron,

opium, lettuce seeds, and camel's thorn manna; *Nymphaea alba* leaves in water or willow oil; lettuce extract, Solanum *nigrum*; marshmallow and psyllium; purslane with rose oil; rose oil, cucumber extract, and vinegar; and black poppy powder with vinegar.[14, 23, 24, 25, 32]

Dietarily, the patient was advised to avoid gas-producing foods. Consuming foods cooked in vinegar and sour grape juice, pumpkin stew, spinach kashkab, lettuce, and poppy, as well as drinking kashkab, willow extract, pomegranate juice, and syrups made from barley husks and sugar, psyllium and rose water, rose water and honey, rose oil and cold water with vinegar, and *Ocimum basilicum* with ice water and rose water, was recommended to alleviate heat-induced headaches.[18, 24]

Hami Yawm (One-Day Fever):

Another complication of inhaling hot air was an increase in heart heat and animal spirit, spreading through the arteries and causing fever. Symptoms included increased liver heat, thirst, facial and eye redness, headache, and respiratory issues. Treatments included diuretic drinks like cucumber, melon, and purslane seed water with simple oxymel. To reduce body heat and soften the temperament, consuming cotoneaster, plums, cucumber pulp, mulberries, psyllium mucilage with sugar, and syrups of common violet, *Nymphaea alba*, rhubarb with a little rose oil, sweet-sour pomegranate juice, and tamarind was advised. Applying a cloth soaked in rose water, rose oil, and unripe vinegar to the head, face, and chest was effective. As the fever subsided, putting the feet into a dection of chamomile, *Andropogon schoenanthus*, Common violet, *Nymphaea alba*, *Ocimum basilicum*, and willow blossom, as well as a moderate-temperature bathing in lukewarm water, massaging the body with common violet oil, and resting on a soft bed were recommended. Dietarily, the patient was advised to avoid fasting and hot-temperament foods, instead consuming light, cold-temperament foods. Resting in a cool environment, enhanced with ice and cold-temperament fragrances, accelerated recovery.[14, 18, 24]

Conclusion

One of the overlooked yet fascinating topics in the history of medicine is the exploration and explanation of the role of environmental, climatic, and geographical factors as reflected in classical Iranian medical texts. These texts discuss the effects of heat and cold on human health and well-being. As mentioned, most regions of Iran are located in hot and arid climatic zones. Prolonged exposure to heat can lead to various bodily complications and reduced productivity in daily life. Given the increasing global temperatures and the issue of global warming in recent years, along with the associated challenges, familiarity with the insights of prominent past physicians on protecting the body from heat and its effects can be highly beneficial and practical.

Iranian physicians have always believed that environmental and climatic factors play a significant role in the decline or enhancement of human health. Among the most important environmental factors is air. The human body is perpetually surrounded by air, and biological survival depends on breathing—inhaling and exhaling. There is a direct relationship between the balance/imbalance of air and the decrease/increase in human health. Temperature changes, whether a decrease or increase, are among the factors that disrupt the qualitative balance of air. Exposure to heat during hot seasons or during changes in conditions, such as travel, can compromise an individual's health, leading to various injuries and functional disorders in different body parts.

Given the preventive approach emphasized in the humoral medical system, maintaining health in the face of heat is closely tied to adhering to the health preservation measures proposed by Iranian physicians. These measures, framed within the six essential principles (*Sitteh Zaruriyah*), involve gradually acclimating the body to heat to prevent any complications. A significant portion of the recommendations by Iranian physicians pertains to the consumption of foods and beverages suited to heat, often with cold/moist temperaments, aimed at combating dehydration and thirst caused by excessive sweating.

Exposure to heat, sunlight, and hot winds can lead to various injuries and illnesses affecting different body parts. Despite the emphasis on preventive measures, if heat exposure results in injury or illness, the use of various therapeutic methods is recommended. In light of the rising global temperatures and the issue of global warming in recent years, understanding the perspectives of past physicians on combating heat can be both beneficial and practical, offering a qualitative epistemological study.

Highlights

What Is Already Known?
Traditional Iranian medicine considers heatstroke to be caused by the qualitative imbalance of hot and dry air, and has previously recommended principles such as choosing cool dwellings, avoiding bloodletting during intense heat, and consuming cold and moist foods and drinks (e.g., barley, cucumber, and oxymel) for prevention and treatment.

What Does This Study Add?
This study, for the first time, comprehensively and systematically compiles and analyzes a complete set of preventive and therapeutic measures from traditional Iranian medicine against heatstroke, including methods for protecting body parts (skin, eyes, ears, nose), dealing with the Samum wind, and treating heat-related illnesses such as Qashfi, Suda', Hami Yawm, and Sahar, based on classical Iranian medical texts.

Authors' Contributions

JAS and SAG conceived and designed the study, conducted research, and collected and organized data. JAS GhM and SAG wrote the initial and final draft of the article and provided logistical support. All authors have critically reviewed and approved the final draft.

Consent For Publication

Not applicable.

Ethics approval

This research project, with for the grant number 31467, code IR.SUMS.REC.1403.340, has been approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran.

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The extent of AI use

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Conflicts of Interest

The authors declare no conflicts of interest.

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