

Ilaj bil-Ma' (Hydrotherapy) as a Regimenal Modality in Pain Management: Conceptual Foundations in Unani Medicine and Modern Correlation

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Abstract

Waja (pain) is one of the most common clinical complaints encountered worldwide and remains a leading cause of disability, impaired functional capacity, and diminished quality of life. In the Unani system of medicine, pain is not considered merely a symptom but a significant manifestation of disturbed physiological balance. Classical Unani scholars describe pain as arising from derangement in Mizāj (temperament), imbalance of Akhlāt (humours), Sudad (obstruction within bodily channels), Waram (inflammation), or Tafarruq-i-Ittiṣāl (disruption of continuity or structural integrity). Management, therefore, aims not only at symptomatic relief but also at correction of the underlying causative imbalance. Among the various therapeutic modalities of 'Ilāj bi'l Tadbīr (regimenal therapy), *Ilaj bil-Ma'* (Hydrotherapy) occupies an important position due to its non-pharmacological, safe, and versatile nature. Hydrotherapy utilizes water in different forms, such as baths, compresses, fomentation, steam, immersion, irrigation, and showers, applied at varying temperatures according to the patient's condition and temperament. In Unani medicine, these procedures are believed to restore humoral equilibrium, enhance circulation, soften morbid matter, relieve muscular spasm, open obstructed channels, reduce inflammation, and strengthen the Quwwat-e-Mudabbira-e-Badan (Tabi'at), the body's innate healing force. Hot water applications are commonly employed for chronic pain, stiffness, and cold temperament disorders, whereas cold applications are preferred for acute inflammatory pain, swelling, and burning sensations. Alternating hot and cold therapies may further stimulate vascular response and improve tissue recovery. This paper comprehensively reviews the role of hydrotherapy in pain management from the Unani perspective, discussing its historical background, conceptual basis, physical principles, static and dynamic properties of water, mechanisms of analgesic action, therapeutic indications, methods of administration, precautions, and contraindications. It also correlates classical Unani concepts with contemporary scientific evidence, including effects on circulation, neuromuscular relaxation, inflammatory mediators, and pain modulation pathways. Hydrotherapy emerges as an economical, accessible, and effective complementary approach for managing musculoskeletal, neurological, inflammatory, and functional pain disorders.

Keywords: Hydrotherapy, pain management, 'Ilāj bi'l Tadbīr, Unani medicine, Hammām, Waja.

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INTRODUCTION

Pain is a complex sensory and emotional experience associated with actual or potential tissue damage [1, 2]. It may be acute or chronic and can originate from musculoskeletal, neurological, inflammatory, or visceral causes. In modern clinical practice, pain management largely depends on pharmacological agents, such as analgesics, non-steroidal anti-inflammatory drugs, and opioids, which often provide symptomatic relief but may lead to adverse effects with prolonged use [3–5].

Unani medicine adopts a holistic approach to pain management by identifying and correcting the underlying causes rather than merely suppressing symptoms. Among the various therapeutic modalities described in Unani medicine, hydrotherapy holds a special position due to its simplicity, safety, cost-effectiveness, and wide applicability. The therapeutic use of water has been practiced since ancient times and remains relevant in contemporary integrative medicine, particularly for the management of chronic pain conditions [6].

METHODOLOGY

This study was conducted as a narrative descriptive review synthesizing classical Unani literature and contemporary scientific evidence on hydrotherapy in pain management. Relevant material was obtained from authoritative classical texts and electronic databases, including PubMed, Google Scholar, and ScienceDirect, using keywords such as *hydrotherapy*, *balneotherapy*, *aquatic therapy*, *pain*, and *Unani medicine*. Publications available in English or Urdu up to 2024 were considered. Sources relevant to therapeutic mechanisms, clinical applications, or traditional concepts were included, while non-relevant and duplicate materials were excluded. The data were analyzed qualitatively and synthesized thematically.

HISTORICAL BACKGROUND OF HYDROTHERAPY

The use of water as a therapeutic agent has been documented since ancient civilizations. Buqrāt (Hippocrates) advocated the use of hot and cold-water applications to relieve pain, inflammation, and stiffness [1]. Jālīnūs (Galen) further elaborated on the effects of baths on circulation, muscle tone, and balance of the nervous system [7].

In Unani medicine, Zakariyyā Rāzī emphasized the use of hot and cold baths for musculoskeletal and inflammatory pain [8]. Ibn Sīnā, in *Al-Qānūn fi'l Tibb*, provided detailed descriptions of *Hammām*, fomentation, and water compresses, highlighting their role in dispersing morbid matter and relieving pain [9]. Later scholars, such as Ibn Hubal Baghdādī and Ismā'īl Jurjānī, refined hydrotherapy into a structured regimen, integrating it with the principles of *Mizāj* and humoral balance [10, 11].

CONCEPT OF WAJA' (PAIN) IN UNANI MEDICINE

In the Unani system of medicine, *Waja'* (pain) is regarded as an unpleasant sensory perception that arises due to a disturbance in the normal physiological and structural state of an organ. Pain is not viewed as an independent disease entity; rather, it is considered a clinical manifestation of underlying derangements in *Mizāj* (temperament), *Akhlāṭ* (humours), or structural integrity, indicating disharmony in the internal environment of the body [8, 9].

Classical Unani scholars, particularly Ibn Sīnā and Jālīnūs, emphasized that the fundamental mechanism of pain is *Tafarruq-i-Ittiṣāl*, which refers to a loss of continuity or coherence at the tissue level. According to this concept, any factor, whether temperamental, humoral, obstructive, or inflammatory, that disrupts the natural structure or functional unity of an organ ultimately leads to pain. Importantly, gradual and balanced *Sū'-i-Mizāj Mustawī* (stable morbid temperament) does not produce pain; rather, it is the sudden or abnormal deviation from normal temperament, *Sū'-i-Mizāj Mukhtalif* (unstable morbid temperament), that gives rise to painful sensations [9, 11].

Unani theory explains that pain may originate from multiple etiological factors, including alteration in *Mizāj*, accumulation of *Akhlāṭ Fāsida* (morbid humours), *Sudda* (distension or obstruction) in vessels and tissues, *Waram* (Inflammation), and the presence of *Rīḥ* (gaseous substances). These factors cause either direct tissue irritation or mechanical pressure, both of which result in *Tafarruq-i-Ittiṣāl* and subsequent pain. Additionally, weakness of *Harārat Gharīziyya* (innate heat) reduces the organ's ability to tolerate pathological stimuli, thereby enhancing pain perception [11].

From an Unani perspective, pain also reflects a derangement in *Mizāj*, which denotes the harmonious balance required for normal physiological functioning. When this harmony is disrupted, the *Quwwat*

Hissiyya (sensory factor) becomes abnormally stimulated, producing various qualities of pain depending on the nature of the causative factor. Hence, Unani scholars described pain not only in terms of its cause but also based on its qualitative sensations, as elaborated in the Galenic classification of *Aqsām-i-Waja* [7, 11].

The Unani approach to pain management is, therefore, etiology-oriented and holistic. Effective treatment aims at the removal of the underlying cause, restoration of normal temperament, elimination of morbid humours, relief of obstruction, and strengthening of innate heat. This is achieved through an integrated application of *Ilaj bil Ghidha* (dietotherapy), *Ilāj bil Dawa* (pharmacotherapy), and *'Ilāj bi'l Tadbīr* (regimenal therapy), rather than merely suppressing the sensation of pain [12].

***Aqsām-i-Waja* (Types of Pain) in Unani Medicine**

According to this classification, pain manifests in the following forms:

- *Waja' Hakkāk (Pruritic Pain/Itching Pain)*: Itching type of pain accompanied by irritation, caused by sharp, penetrating, or saline humours [13, 14].
- *Waja' Khāshin (Course/ Rough pain)*: Rough or coarse pain produced by thick and viscid humours irritating tissue surfaces [8, 15].
- *Waja' Zaghit (Compression/Squeezing pain)*: Compression or crushing pain resulting from the accumulation of dense matter exerting pressure on an organ [13, 16].
- *Waja' Nākhis (Pricking Pain)*: Pain commonly affecting membranous structures, such as the pleura, caused by stretching and hardening of tissues [14, 17].
- *Waja' Tamaddudī (Distension Pain)*: Pain due to gaseous substances or morbid humours causing expansion of organ cavities or layers [8, 13].
- *Waja' Mufassikh (Incisive Pain)*: Muscular pain caused by humoral infiltration into muscle fibres leading to their expansion and irritation [15, 16].
- *Waja' Mukassir (Fractural/Bony Pain)*: Bone-breaking pain arising from flatus or morbid humours accumulating between bone and periosteum; exposure to cold may aggravate it [13, 14].
- *Waja' Rikhū (Dull pain)*: Pain associated with muscular weakness and reduced tone, usually mild but persistent [8, 17].
- *Waja' Sāqib (Perforating Pain/Piercing Pain/ Boring Pain)*: Perforating or penetrating pain, often colicky in nature, caused by vaporous matter within organ cavities or tissue layers [13, 16].
- *Waja' Mithālī (Stabbing pain)*: It is a colicky nature of pain caused by the accumulation of flatus or humour in the compartment of the large intestine. As a result, transverse stretching in its layers results in the separation of continuity [8, 14].
- *Waja' Khadarī (Neuropathic Pain)*: Neuropathic pain characterized by pain with paraesthesia, caused by obstruction of sensory perception due to excessive cold temperament [13, 15].
- *Waja' Zarabānī (Throbbing Pain)*: A pulsating nature of pain caused either by acute inflammatory processor accumulation of irritating and acrid humours such as migraine [8, 14].
- *Waja' Saqīl (Heavy Pain)*: A type of heavy pain about less sensitive /viscera, e.g., lungs, kidneys, spleen, or when the sensory loss of any sensitive part, such as the cardiac end of the stomach, is highly sensitive when carcinoma affects it, producing *Waja' Saqīl* (heavy pain) [13, 16].
- *Waja' Ayā'ī (Fatigue Pain)*: A type of pain caused by fatigue due to overwork, which produces a perception of incongruity in the body. Excessive movement and acrid humour cause tension in muscles and nerves, which leads to impaired temperament and discontinuity, resulting in fatigue pain [8, 15].
- *Waja' Ladh'ī (Irritative Pain)*: Irritative pain produced by *Khilṭ-e-Lāzija* (irritant humours), leading to burning and discomfort at the site of accumulation such as *Waja' -ul-Fu'ād* [8, 15].

CONCEPTUAL BASIS OF HYDROTHERAPY IN UNANI MEDICINE

Water possesses an inherent *Bārid Raṭb* (cold and moist temperament). By altering its temperature, duration, and mode of application, it can be used effectively for both hot and cold disorders [9]. The selection of hydrotherapy depends on the patient's temperament, nature of disease, stage of pain, strength, age, and seasonal factors [10].

Hydrotherapy supports *Tabi'at* (the natural healing force of the body) by enhancing circulation, improving metabolism, facilitating elimination of waste products, and inducing muscular and nervous relaxation [8]. It also assists in humoral modulation by dispersing and evacuating morbid matter, reducing congestion, and restoring humoral balance, which is central to pain relief in chronic disorders [3, 11].

CLASSIFICATION OF HYDROTHERAPY USED IN PAIN MANAGEMENT

Based on Temperature

Ilāj bi'l-Mā' al-Ḥārr (Hot Water Therapy)

Hot water therapy is indicated in chronic, non-inflammatory pain states characterized by stiffness, rigidity, and humoral stagnation. It is preferred where cold temperament predominates, and tissue relaxation is required [8, 9].

Ilāj bi'l-Mā' al-Bārid (Cold Water Therapy)

Cold water therapy is employed in acute and inflammatory pain states, particularly where excessive heat, swelling, and recent tissue insult are present. It is primarily used to control acute pain and inflammatory responses [4, 11].

Contrast Therapy (Ilāj bi'l-Mā' al-Ḥārr wa'l-Bārid)

Contrast therapy involves the alternate application of hot and cold water. It is utilized in transitional stages of pain management, especially during recovery and rehabilitation, to restore functional balance and tissue adaptability [4, 10].

Based on the Mode of Application

- *Hammām* (Therapeutic Bath).
- *Kimād* (Fomentation).
- *Pāshoya* (Footbath).
- *Naṭūl* (Douche).
- *Sakūb* (Irrigation).
- *Ābzān* (Sitz bath).
- Hot and cold compresses.
- Water massage and showers [9, 12].

PHYSICAL PRINCIPLES OF HYDROTHERAPY (FLUID MECHANICS)

Hydrotherapy is founded on the principles of fluid mechanics, which describe the behaviour of water and its interaction with the human body during immersion and movement. Water is a fluid with a definite volume, minimal compressibility, and the capacity to exert pressure uniformly in all directions. The physical behaviour of water during hydrotherapy is governed by parameters such as buoyancy, hydrostatic pressure, density, viscosity, and hydrodynamic resistance [4, 18].

Buoyancy, as explained by Archimedes' principle, refers to the upward force exerted by water on an immersed body. The magnitude of this force depends on the volume of water displaced and results in an apparent reduction of body weight during immersion.

Hydrostatic pressure increases proportionally with the depth of immersion and acts evenly on all submerged surfaces. This pressure is a fundamental physical property of fluids and is independent of body movement.

Viscosity describes the internal friction within water that resists motion, while hydrodynamic resistance arises when a body moves through water. Factors, such as surface area, velocity, and direction of movement, influence the magnitude of resistance encountered. These properties determine the physical environment experienced by the body during hydrotherapy sessions [5].

THERAPEUTIC MECHANISMS AND PHYSIOLOGICAL RESPONSES IN PAIN RELIEF

The pain-relieving effects of hydrotherapy arise from an integrated interaction of mechanical, neurophysiological, and psychological mechanisms that collectively modulate pain perception and support functional adaptation [19, 20].

Mechanical unloading of the body during water immersion reduces external stress on joints, muscles, and the spine. This redistribution of load creates favourable conditions for movement with minimal strain and facilitates activity in a supported environment [19].

From a neurophysiological perspective, continuous sensory stimulation of cutaneous and proprioceptive receptors during immersion influences pain transmission at spinal and supraspinal levels [21]. This sensory modulation alters pain signalling and contributes to reduced pain perception.

Hydrotherapy further promotes neuromuscular relaxation, leading to a reduction in muscle tension and improved movement efficiency. Simultaneously, the aquatic environment produces a psychological calming effect by reducing anxiety, stress, and pain-related apprehension, thereby enhancing pain tolerance [19].

The combined influence of these mechanisms results in modulation of pain perception, improved movement efficiency, and enhanced physical and psychological adaptability. By acting through non-pharmacological pathways, hydrotherapy provides a safe and supportive environment for pain modulation and rehabilitation, particularly in chronic pain conditions.

THERAPEUTIC APPLICATIONS IN PAIN MANAGEMENT

Hydrotherapy is clinically applied in the management of musculoskeletal pain disorders, including *Waja'al-Mafāsīl* (osteoarthritis and rheumatoid arthritis), *Waja'al-Raqaba* (cervical spondylosis), *Waja'al-Qaṭan* (lumbar spondylosis), *Waja'al-Zahr* (chronic back pain), and *Waja'al-'Aḍālāt* (muscular spasm), where it supports pain reduction and restoration of functional capacity [22, 23]. It is also utilized in acute injuries and sports-related pain, such as *Waja'Ḥādd*, *Ḍarb*, and *Ṣadmah* (traumatic injuries), and *Wathā* (ligament sprain), as part of structured rehabilitation programs to assist recovery and facilitate a gradual return to physical activity [24].

Hydrotherapy serves as a supportive modality in neuropathic and functional pain syndromes corresponding to *Waja'Aṣabī* (neuropathic pain) and *Waja'Nafsānī* (functional or psychosomatic pain), where it improves patient comfort and tolerance to therapeutic interventions [25].

Specific applications, such as *Ābzan* (sitz bath), are employed in gynaecological and pelvic pain disorders, including *Waja'al-Raḥim* (uterine pain), *Warm al-Raḥim* (pelvic inflammatory conditions), and perineal pain [20]. Hydrotherapy also plays a supportive role in postoperative rehabilitation, particularly in *Ba'd al-Jarāḥat* (post-surgical pain), by facilitating early mobilization and recovery of functional capacity [22].

CONTRAINDICATIONS AND PRECAUTIONS

Hydrotherapy should be avoided or administered with caution in acute febrile illnesses, severe cardiovascular disorders, extreme debility, advanced pregnancy, and in patients with sensory impairment [4, 5]. In Unani medicine, careful assessment of *Mizāj*, disease stage, and overall strength of the patient is considered essential before initiating hydrotherapy to prevent adverse outcomes and to ensure optimal therapeutic benefit [9].

CORRELATION WITH MODERN MEDICINE

Contemporary medical research increasingly recognizes hydrotherapy as an effective non-pharmacological modality for pain management, particularly in chronic musculoskeletal, neurological, and inflammatory disorders, owing to its combined thermal and mechanical effects [4, 26]. Warm water

immersion produces peripheral vasodilation, enhances microcirculation, and improves tissue oxygenation, thereby facilitating the clearance of inflammatory mediators and metabolic waste products associated with pain [20, 27]. These physiological effects closely correspond with Unani concepts, such as *Tanqiya-i-Mawād* and *Tahlil-i-Waram*, wherein improved circulation supports dispersion and evacuation of *Akhlāt Fasida* (morbid humours).

Neurophysiological evidence suggests that thermal and tactile stimulation during hydrotherapy modulates pain perception by influencing afferent sensory input at spinal and supraspinal levels and activating endogenous pain inhibitory mechanisms, including gate-control and descending analgesic pathways [28]. From an Unani perspective, this modulation reflects restoration of the normal *Mizāj* of nerves and muscles and correction of *ikhtilāl-i-Hiss*, ultimately resulting in *Taskīn-i-Waja'* [14]. Furthermore, the buoyant aquatic environment reduces axial loading and mechanical stress on the joints and spine, thereby improving functional mobility and decreasing nociceptive input, resulting in alleviation of pain through reduction of mechanical load on body structures [29, 30]. This effect aligns with Unani principles, where reduction of *Imtilā'* (congestion) and correction of *Mizāj* are emphasized for pain relief and restoration of normal physiological function [8].

In addition to somatic benefits, hydrotherapy exerts significant psychological and autonomic effects, including reductions in sympathetic overactivity, enhancements of parasympathetic tone, stress reduction, and improvements in sleep quality – factors that play a critical role in chronic pain modulation [19, 26]. In Unani medicine, these outcomes indicate strengthening of *Tabi'at* and restoration of psychophysical equilibrium. Thus, both modern scientific evidence and Unani theoretical principles converge to support hydrotherapy as a rational, holistic, and integrative approach to pain management.

DISCUSSION

Hydrotherapy occupies an important place among non-pharmacological interventions for pain management within the Unani system of medicine. Unlike symptomatic approaches that focus solely on suppressing pain, hydrotherapy works by modifying the internal and external environment of the body, thereby addressing the underlying pathological factors such as abnormal temperament, accumulation of morbid matter, obstruction of channels, and muscular rigidity. The combined effects of thermal regulation, mechanical support, and neuromuscular relaxation make hydrotherapy a versatile regimen applicable to both acute and chronic pain conditions.

The integration of hydrotherapy with other Unani treatment modalities, particularly *'Ilāj bi'l Ghidhā'* (dietotherapy) and *'Ilāj bi'l Dawā'* (pharmacotherapy), enhances its therapeutic efficacy. Dietary regulation supports humoral balance, while appropriate Unani drugs assist in evacuating and correcting morbid humours. Hydrotherapy, in this integrated approach, facilitates better circulation, improves tissue receptivity, and accelerates the action of other therapies. Its holistic nature, safety profile, and adaptability according to *Mizāj* and disease stage make it especially suitable for long-term management of chronic pain disorders, where prolonged drug use may be undesirable.

CONCLUSION

Hydrotherapy is a valuable and effective regimenal modality for pain management in Unani medicine. Employing the physical properties of water in a rational and individualized manner, it alleviates pain through correction of temperament, dispersion of morbid matter, reduction of inflammation, and strengthening of the *Tabi'at* (body's innate healing power). Its ability to provide relief without significant adverse effects highlights its importance as a safe and sustainable therapeutic option.

In the present era of integrative medicine, hydrotherapy offers a bridge between classical Unani principles and contemporary pain management strategies. Standardization of therapeutic protocols and well-designed clinical studies can further validate its efficacy and promote its wider acceptance in evidence-based practice. Incorporation of hydrotherapy into comprehensive pain management programs may significantly improve patient outcomes and quality of life.

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Conflict of Interest Statement

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