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Review Article

Unani Regimenal Approaches for Pain, Function and Quality of Life in Knee Osteoarthritis: A Rapid Scoping Review of Current Evidence

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Abstract

Background: Knee osteoarthritis (KOA) is a prevalent degenerative joint disorder that leads to chronic pain and disability. Conventional therapies provide only limited long-term relief and are often associated with adverse effects and high cost. In Unani medicine, KOA is closely related to *Waja' al-Rukba*, categorized under joint disorders, and managed through various regimenal therapies.

Objective: This scoping review aimed to evaluate the effectiveness of Unani regimenal therapies in the management of KOA.

Methods: A systematic search was conducted across PubMed, Google Scholar, and other relevant databases for studies published between January 2009 and March 2024. Keywords included "Knee osteoarthritis, *Waja' al-Rukba*, Unani medicine, Greco-Arab medicine." Eligible studies consisted of clinical trials, observational studies, and case studies assessing outcomes such as the Visual Analogue Scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and Knee Injury and Osteoarthritis Outcome Score (KOOS).

Results: A total of relevant Unani regimenal therapies were identified, including *Hijama* (cupping), *Dalk* (massage), *Tadhīn* (oiling), *Takmīd* (fomentation), *Dimād* (poultice), *Irsaal-e-'Alaq* (leech therapy), and *Qai* (emesis). Across multiple studies, these therapies demonstrated statistically significant improvements in pain reduction and functional outcomes (p<0.001 in several trials). Notably, no major adverse effects were reported.

Conclusion: Existing evidence suggests that Unani regimenal therapies are effective and safe in improving pain and function among KOA patients. However, most studies to date are small-scale, single-center, and methodologically heterogeneous. Larger, well-designed randomized controlled trials are needed to validate these findings and establish Unani therapies as cost-effective, complementary options in KOA management.

Keywords: *Waja' al-Rukba*, Unani medicine, Cupping, Massage, Fomentation, Traditional medicine

INTRODUCTION:

Osteoarthritis (OA) is primarily a disorder of abnormal joint biomechanics, marked by the gradual degeneration of articular cartilage. Its underlying pathological alterations are largely mediated through biochemical mechanisms¹. Among the various joints affected, the knee is one of the most common sites of OA and is considered highly debilitating². Knee osteoarthritis (KOA) most frequently involves the patellofemoral and medial tibiofemoral compartments. Its high prevalence,

particularly among the elderly, and its significant association with disability makes it one of the leading causes of functional decline in aging populations³. Clinically, KOA is manifested by pain, tenderness, restricted mobility, crepitus, occasional effusion, and varying degrees of inflammation⁴.

Conventional management options for OA include pharmacological interventions such as non-steroidal anti-inflammatory drugs (NSAIDs) and cyclooxygenase-2 inhibitors, physical therapies like exercise and

thermotherapy, intra-articular corticosteroid injections, and surgical approaches including joint repair and replacement⁵. Despite these options, the disease is progressive in nature and often leads to persistent pain and disability. Since existing modalities are either costly, associated with adverse effects, or unable to halt disease progression, there remains a strong need for safer, more affordable, and effective alternatives. This necessity has drawn attention toward the scientific validation of traditional medicines.

In the Unani system of medicine, the specific term for KOA, *Waja' al-Rukba*, is not explicitly found in classical texts. Instead, the broader term *Waja' al-Mafāsil* is extensively described to denote joint disorders, encompassing conditions like *Niqris* (gout), *Waja' al-Warik* (hip pain), *Iraq al-Nasa* (sciatica), and *Waja' al-Rukba* (knee pain)⁶. Prominent Unani scholars, including *Buqrāt* (Hippocrates, 460–377 B.C.), *Jālinūs (Galen, 129–200 A.D.)*, *Rabban Tabri (770/780–859 A.D.)*, *Zakariya Rāzi (850–923 A.D.)*, *Ali Ibn Abbas Majūsi (930–994 A.D.)*, and *Ibn Sīna (980–1037 A.D.)* interpreted *Waja' al-Mafāsil* as a result of qualitative and quantitative disturbances in the *Akhlāt* (humours)⁷. *Rāzi* emphasized that the pain arises mainly due to the accumulation of abnormal humours within the joint spaces, which originate from defective *chylous* formation. ⁶ Specifically, abnormal accumulation of *Balgham* (phlegm) in the joint leads to *Sū²-i-Mizāj* (derangement of temperament), producing pain and tenderness. When caused by pathological *Balgham*, the disorder is termed *Waja' al-Mafāsil Balghami*, which parallels chronic OA in modern medicine. When localized in the knee, this condition is referred to as *Waja' al-Rukba*.

For centuries, Unani physicians have treated *Waja' al-Rukba* through four approaches: *'Ilāj bi'l-Tadbīr* (regimenal therapy), *'Ilāj bi'l-Dawā* (pharmacotherapy), *'Ilāj bi'l-Ghidhā* (dietotherapy), and *'Ilāj bi'l-Yad* (surgery)⁸. Regimenal therapy includes procedures such as *Dalk* (massage), *Fasd* (venesection), *Dimād* (paste application), *Takmīd* (fomentation), *Irsāl al-'Alaq* (leech therapy), and *Hijāma* (cupping). Among these, *Dimād* is a significant dosage form in Unani practice, consisting of powdered drugs mixed with oil or water at the time of use to form a paste. The ingredients usually possess *Muhallil* (resolvent), *Habis* (styptic), *Qabiz* (astringent), and *Dāfi^c-i-Taffun* (antiseptic) properties.

Several clinical studies have examined different Unani regimenal therapies for KOA. *Tadheen* (oiling) has been explored as a therapeutic option in three studies^{14,22}. *Irsāl al-'Alaq* (leech therapy), also assessed in clinical studies, involves application of medicinal leeches to evacuate morbid humours and deliver bioactive molecules present in leech saliva. These secretions have been shown to exhibit analgesic, anti-inflammatory, anticoagulant, antiplatelet, thrombin regulatory, extracellular matrix degradative, and antimicrobial properties. The therapeutic benefits may also be attributed to the *Mussakkin* (sedative) and *Muhallil* (anti-inflammatory) actions of leech saliva. Clinical

evidence supports the efficacy of leech therapy in relieving KOA symptoms^{14,22}.

Takmīd (fomentation), included in another study, is the application of hot (*har*) or cold (*bārid*) substances over the body for therapeutic benefits¹⁵. It exerts multiple effects, including pain relief, muscle relaxation, improved circulation, reduced inflammation, enhanced absorption through skin, and modulation of cutaneous nerve endings depending on the applied temperature. This method has wide therapeutic use in joint diseases, spinal ailments, geriatric disorders, and systemic conditions.

One study also reported the role of *Qai* (emesis) in managing *Waja' al-Rukba*. This regimen eliminates *akhlāt-e-raddiya* (morbid metabolic humours) from the stomach and the entire body via induced reverse peristalsis using specific emetic drugs (*Advia-e-Muqiyāt*). Emetics act by irritating the gastric mucosa, which activates the central vomiting center. Historically, Unani physicians have employed *Qai* to manage conditions such as headache, migraine, *Junoon* (mania), melancholia, gastrointestinal and hepatic disorders, kidney and skin ailments, joint diseases, and febrile illnesses. A study evaluating the efficacy of *Qai*, *Munzīj wa Mushil-e-Balgham* (concoctive and purgative of phlegm), along with *Dalk* using *Roghan-e-Chobchini*, demonstrated that this combined regimen is safe and effective in significantly improving KOA symptoms.

Methods

Ethics and Dissemination

As this review is based solely on published literature and does not involve direct patient participation or collection of personal data, ethical approval was not required.

Eligibility Criteria

Types of participants

Human clinical studies that evaluated Unani regimenal therapies in the management of *Waja' al-Rukba* (knee osteoarthritis) were considered eligible.

Types of intervention and control

Studies were included if participants received Unani regimenal therapy either as a standalone treatment or in combination with a limited number of Unani drugs. Control groups could include active controls, placebos, or any comparative design against Unani regimenal therapy. Research not specifying Unani regimenal modalities were excluded.

Types of studies

Eligible designs comprised case reports, case series, pilot studies, randomized controlled trials (RCTs), and non-randomized controlled clinical trials (CCTs).

Main outcomes

To be included, studies had to assess at least one clinically relevant outcome measure of KOA, such as the Visual Analogue Scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC),

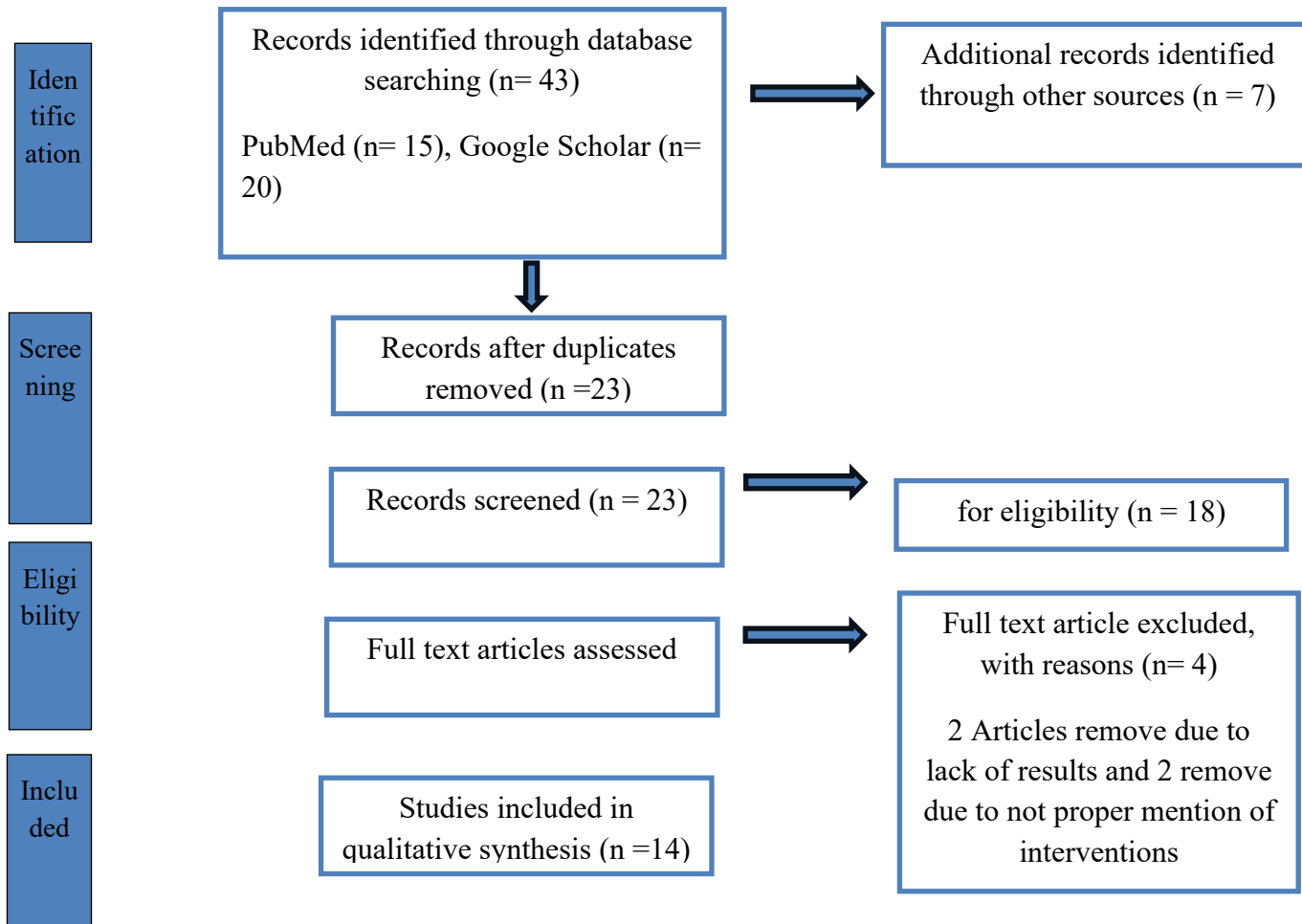
or the Knee Injury and Osteoarthritis Outcome Score (KOOS).

Data Sources and Search Strategy

Relevant data were retrieved from PubMed, Google Scholar, and Google using a predefined set of keywords:

“Knee osteoarthritis, *Waja' al-Rukba*, *Waja'al-Mafāsil*, *Ilaj bi'l-Tadbīr*, Unani Medicine, Greco-Arab Medicine.” The search was restricted to English-language articles published between January 2009 and March 2024. The process of study selection is shown in Figure 1.

Figure 1: PRISMA flowchart of the study selection process



Data Extraction and Management

Two reviewers independently extracted information regarding study design, interventions, outcome measures, and results using a structured extraction

form. The following data points were systematically recorded: author name, year of publication, intervention used, outcome measures assessed, and main findings (Table 1).

Table 1: Screened Articles

Author	Year of publication	Study design	Sample Size	Internal Medication	Regimena l Therapy	Scale used	Outcome	Ref
Dr. Meraj Meraj et al.	2024	Case study	1		<i>Dimād</i> (semisolid paste) with <i>Dimād jalinoos</i>	VAS	Before the treatment VAS score were 9 and WOMAC Score 72 after treatment VAS were 1 and WOMAC were 28	9
Dr. Mubasheera Begum et	2024	A randomised single-blind parallel-arm comparative	60 Patients in 4 groups,1	<i>Habb-e-Gule Aakh</i> in different doses		VAS and WOMA	shows significant improvement(p<0.001) in patients of all groups and values of	10

al.		(dose escalation study)	5 patients in each group	in 4 groups		C	VAS baseline to 14 th day was <0,001	
Shaheen Khatoon	2023	Comparative clinical trial	60 patients 30 in each group	<i>Habb-e-hudari</i> (in group a)	Dry cupping (in group b)	VAS and WOMA C	Group A WOMAC: 59.17 → 23.33 VAS: 8.90 → 2.40 Group B WOMAC: 8.90 → 0.90 VAS: 8.90 → 0.90 Conclusion: Group B showed greater improvement in both WOMAC and VAS scores compared to Group A (p<0.001).	11
Sadaf T.A. Shaikh et al.	2023	Case study	1		<i>Dimād</i> (semisolid paste)	VAS and WOMA C	The total score (subjective and objective parameters) at baseline was 68 which improves to 52(23.5%) and 29(57.3%) which signifies the considerable improvement	12
Meara Ul Islam, et al.	2021	A randomized comparative control clinical trial	48 patients 24 in each group		Prolonged massage (group A) Dry cupping (group b)	KOOS and VAS	VAS Score Results: Group A showed a significant decrease in VAS score from 8.05 ± 1.46 to 3.2 ± 1.19 (mean difference 4.85 ± 0.27, p ≤ 0.001). Group B showed a reduction from 7.85 ± 1.42 to 3.66 ± 1.42 (mean difference 4.19 ± 0.00, p ≤ 0.001). Intergroup Comparison: The difference in VAS scores between the groups at both day 0 and day 20 was not statistically significant (p > 0.05). KOOS Assessment: Intragroup improvements were highly significant (p ≤ 0.001), but intergroup differences remained non-significant at both time points.	13

Dr Sayyed Adnan, Dr Abdul Nasir Ansari	2020	An open labelled, pre and post Clinical study	30 patients	<i>Munzij wa Mus'hil -e- Balgha m</i>	<i>Qaiand Dalkwith Roghan- e- Chobchini</i>	KOOS	KOOS were found to be highly significant. (p=<0.001) VAS score was also highly significant. No adverse events were observed throughout the trial.	14
Aysha Ansari	2019	Case study	1	<i>Habb-e-Sūranjān</i>	<i>Takmid-e-Hār Ratab</i>	KOOS	At the end of the treatment patient got significant relief in subjective and objective parameters	15
Aysha Ansari, Saima Saleem	2019	A Comparative Observational Study	20 patients 10 in each group	<i>Habb-e-Muqil</i> In control group Analgesic and muscle relaxant	<i>Dalk</i> (massage) was done with <i>Roghan-e-Haft Barg</i>	VAS	Both groups showed equal recovery, but the Unani treatment group reported higher satisfaction. The Unani formulation is safe, cost-effective, and free from side effect	16
MCN Razana	2018	A comparative , open, randomized, active control clinical trial	20 patents in test group and 15 in control group	<i>Habb-e-Sūranjān</i>	<i>Dimād</i> in test group In control group <i>Hijama bila shart</i>	WOMAC	Results: There was a statistically significant improvement in subjective parameters, KOOS total score increased from 33.09 ± 2.19 to 46.74 ± 2.03 (p < 0.001) VAS score reduced from 66.83 ± 1.90 to 56.80 ± 2.57 after 4 weeks (p < 0.001). Walking time decreased from 23.97 ± 0.62 to 22.85 ± 0.53 seconds (p < 0.05).	17
Mohamed Shiffa	2016	Series of case studies	30 patients	<i>Qurs-e-mufasil</i>		KOOS and VAAS	KOOS score improved significantly from 33.09 ± 2.19 to 46.74 ± 2.03 (p < 0.001) VAS score decreased from 66.83 ± 1.90 to 56.80 ± 2.57 after 4 weeks (p < 0.001) Walking time reduced from 23.97 ± 0.62 to 22.85 ± 0.53 seconds (p < 0.05), showing significant improvement.	18
Abdul kabir dar, Azad Hussain lone	2015	Observational trail	75 patients		Dry Cupping	WOMAC and VAS	Post-treatment mean WOMAC and VAS scores were significantly reduced compared to pre-treatment scores (P < 0.001).	19

Asim ali khan	2013	A randomized, controlled clinical trial	Total 60 patients, 30 in test and 30 in control group	Acetaminophen (group a)	Dry Cupping (group b)	Pain scale	The effect of both the cupping and acetaminophen was extremely significant with P value in Group A < 0.0018, whereas in Group B was < 0.0009.	20
Azad Hussain lone	2013	Open randomized uncontrolled trial	35 patients		leech	WOMAC and VAS	Post-treatment WOMAC and VAS scores were significantly reduced compared to pre-treatment scores (P < 0.001), indicating that leech therapy is statistically effective in managing osteoarthritis.	21
SM Abbas Zaidi	2009	Prospective single centered randomized controlled trial	Total 40 patients, 20 in each group	<i>Safoof mafasil khaas</i>	<i>Tadheen with Suranjan oil</i>	WOMAC and VAS	At the end of the treatment patient got significant relief in subjective and objective parameters.	22

Results

1. Studies Included

A total of more than 14 studies, including case reports, case series, randomized controlled trials, and observational studies, were identified and reviewed for this study.

Interventions Assessed

The regimnal interventions identified in the included studies were:

- *Dalk* (massage)
- *Hijama* (cupping therapy)
- *Irsal-e-Alaq* (leech therapy)
- *Dimād* (poultice/paste application)
- *Takmīd* (hot/moist fomentation)
- *Tadhīn* (oiling/liniment application)
- In some cases, these were supplemented with oral Unani formulations.

Outcome Measures

The clinical outcomes were evaluated using the following standardized tools:

- **VAS (Visual Analogue Scale):** for assessing pain severity.
- **WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index):** for pain, stiffness, and functional disability.
- **KOOS (Knee Injury and Osteoarthritis Outcome Score):** for knee-specific quality of life.

Key Findings

Case reports and series (e.g., *Dimād*, *Habb-e-Suranjan*, *Habb-e-Gule Aakh*):

- Reported marked clinical benefits. For instance, one case documented a reduction in VAS from 9 to 1 and WOMAC from 72 to 28 after treatment.

Comparative/controlled trials:

- **Massage vs. Cupping:** Both interventions produced significant reductions in VAS (4–5 points) with parallel improvement in KOOS.
- **Dry cupping vs. *Habb-e-Hudar*:** Both showed benefit, though cupping led to superior outcomes in WOMAC and VAS (p<0.001).
- **Leech therapy:** Consistently demonstrated highly significant improvements in pain and stiffness (p<0.001).
- ***Takmīd* (fomentation):** Associated with meaningful pain relief and functional enhancement.
- **Large observational trial (75 patients, dry cupping):** Significant reductions in VAS and WOMAC (p<0.001).

Overall:

Across all studies, Unani regimnal therapies resulted in statistically significant reductions in pain and stiffness, alongside improvements in mobility and quality of life. Most studies reported p-values <0.001. Importantly, no major adverse events were documented, supporting their safety.

Discussion

Review of the included studies revealed statistically significant improvements in WOMAC scores ($p < 0.001^{10}$, $p < 0.001^{11}$, 57.3%¹², $p < 0.001^{17}$, $p < 0.001^{19}$, $p < 0.001^{21}$) and in VAS scores ($p < 0.001^{10}$, $p < 0.001^{11}$, $p \leq 0.001^{13}$, $p < 0.001^{16}$, $p < 0.001^{18}$, $p < 0.001^{19}$, $p < 0.001^{21}$). Improvements in KOOS were also reported ($p < 0.001^{14}$, $p < 0.05^{18}$).

The studies included: five case studies^{9,12,14,15,18}, six comparative trials^{10,11,13,16,17,22}, one standard controlled study²⁰, one observational study¹⁹, and one pilot trial²¹. In nine of these, internal medication was prescribed alongside regimenal therapy.

All studies employed *Ilāj bi'l-Tadbīr* (regimenal therapy), which is essentially the modification of *Asbāb Sitta Darūriyya* (six essential factors). The line of management for *Waja' al-Rukba* as per Unani classics includes modalities such as *Ḥammām* (therapeutic bath), *Riyāḍat* (exercise), *Ṭilā* (liniments), *Dimād* (poultice), *Pāshoya* (foot bath), *Naṭūl* (irrigation therapy), *Tadhīn* (oiling), *Dalk* (massage), *Hijama* (cupping), *Irsal-e-Alaq* (leech therapy), *Fasd* (venesection), *Takmīd* (fomentation), *Ishāl* (purgation), *Qai* (emesis), and *Tareeq* (diaphoresis).

Dalk (massage): Reported in three studies^{13,14,16}. This classical therapy, considered under *Riyāḍat*, employs manual manipulation with medicated oils to produce physiological and psychological effects. It helps dissolve *Akhlāt-e-Fāsida* (morbid humours), warms the body, reduces coldness, mobilizes viscous material, and strengthens musculoskeletal structures. Studies demonstrated significant improvements in KOA.

Hijama (cupping): Investigated in five studies^{11,13,17,19,20}. This procedure produces local evacuation/diversion of humours through negative pressure created by suction. Unani physicians have historically recommended it for arthritis, where the accumulation of disproportionate humours causes inflammation and joint pain. All studies confirmed benefits in KOA.

Dimād (poultice): Used in three studies^{9,12,17}. This preparation, applied in paste form, incorporates drugs with *Muhallil* (resolvent), *Habis* (styptic), *Qabiz* (astringent), and *Dafe' Taffun* (antiseptic) properties.

Tadhīn (oiling): Evaluated in three studies^{14,22}. Application of medicated oils was found to provide symptomatic relief.

Irsal-e-Alaq (leech therapy): Reported in two studies^{14,22}. Leech saliva contains more than 20 active molecules with analgesic, anti-inflammatory, anticoagulant, and antimicrobial effects, contributing to its efficacy in KOA.

Takmīd (fomentation): Assessed in one study¹⁵. Application of hot or cold substances improved circulation, reduced inflammation, and alleviated pain.

Qai (emesis): Investigated in one study. This method eliminates *akhlāt-e-raddiya* (morbid humours) via induced reverse peristalsis using emetic drugs. Its

historical applications include neurological, gastrointestinal, hepatic, and joint disorders. A combined regimen of *Qai*, *Munzij wa Mushil-e-Balgham*, and *Dalk* with *Roghan-e-Chobchini* was reported as safe and effective in KOA.

Overall, all included studies demonstrated statistically significant benefits of Unani regimenal therapies in KOA, though further large-scale clinical trials are necessary to validate these findings.

Limitations

This review is subject to certain limitations. Restricting the search to English-language studies may have excluded relevant research in other languages. Furthermore, the use of only three databases raises the possibility that some gray literature was overlooked.

Conclusion

KOA in modern medicine parallels *Waja' al-Rukba* described in Unani texts. While conventional medicine primarily employs anti-inflammatory drugs that carry potential adverse effects, Unani regimenal therapies have shown promising results in alleviating KOA symptoms without significant side effects. Interventions such as *Hijama* (cupping), *Tadhīn* (oiling), *Dalk* (massage), and *Takmīd* (fomentation) are relatively well studied, whereas therapies like *Naṭūl* (irrigation), *Ḥammām* (therapeutic bath), *Irsal-e-Alaq* (leech therapy), *Riyāḍat* (exercise), *Ṭilā* (liniment), *Dimād* (poultice), *Pāshoya* (foot bath), and *Fasd* (venesection) remain underexplored. Evidence suggests that regimenal therapies, especially when combined with internal medication, yield better outcomes. However, more rigorous clinical trials are needed to strengthen the scientific basis for Unani regimenal management of KOA.

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