ISSN: 2320 - 0251

**Review Article** 



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# Dalak (Massage) in Unani Medicine: A Review

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Publication Date: 27 January 2014

Article Link: http://medical.cloud-journals.com/index.php/IJAAYUSH/article/view/Med-118



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Abstract Regimental therapies are mostly non medicinal procedures for health promotion in *Unani* system of medicine. Several regimens have been used by *Unani* physicians since ancient time, among which *Dalak* (massage) is the most common and widely practiced regimen that is used for restorative, preventive as well as for therapeutic purposes. Massage which has been used in almost all the civilizations in the history, evidence of this is present in several manuscripts. According to Hippocrates (460 BC–370 BC), the father of medicine, massage, balanced diet, exercise, rest and fresh air are essential to maintain health of a person. According to *Ibne Rushd*, massage is a type of exercise used for removal of toxins or waste metabolites from the body. In *Unani* medicine, *Dalak* is one of the very important regimes among the procedures of *Ilaj Bil-Tadbeer* (Regimental therapy) for neurological and musculoskeletal disorders. A number of *Unani* physicians recommended *Dalak* as preventive as well as curative measure. Historical background of *Dalak*, timing, duration, its types and importance, mechanism of action, recent scientific reports and the disorders in which massage can be used have been discussed in this paper.

Keywords Dalak; Massage; Unani Medicine; Musculoskeletal; Neurological Disorders

## 1. Introduction

The *Unani* system of medicine is one of the oldest systems of medicine that is practiced in India and all over the world. The basic principles of this system rely on the concept put forward by Hippocrates and Galen. This system, earlier known as "*Galenics*", later known as *Unani Tibb*, (*Unani* being the Arabic word for "Greek" and *Tibb* for "medicine" [1]. Before 400 BC, the medicine was surrounded by the imagination of magic, spirits and superstition. Hippocrates (460-377 BC) was the person who had freed medicine from superstitious believes and gave the basis for the foundation of medicine [2, 3, 4]. According to his concepts human body is composed of four *Akhlaat* (Humors) viz. *Dam* (blood), *Balgham* (phlegm), *Safra* (yellow bile) and *Sauda* (black bile). The temperament of a person can accordingly be *Damwi* (sanguine), *Balghami* (phlegmatic), *Safrawi* (choleric) and *Saudawi* (melancholic) depending on the presence and combination of humors. According to *Unani* theory, the

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humors and medicinal plants have their own temperaments. Any change in quantity and quality of the humors, bring a change in the health status of the human body. Hence a proper balance of humors is required for the maintenance of health and for the prevention of disease [3, 5, 6, 7].

The concept of *Tabiyat* (nature) has a vast and unique meaning in itself and is considered to be the best physician who is responsible for the maintenance of equilibrium of four humors of the body [3, 8].

In *Unani* system of Medicine, to restore the health, various types of treatment are employed such as *Ilaj-bil-Tadbeer* (Regimental therapy), *Ilaj-bil-Ghiza* (Diet therapy), *Ilaj-bid-Dawa* (Pharmacotherapy) and *Jarahat* (Surgery) [9, 10].

Regimental therapies are mostly non medicinal procedures for health promotion in *Unani* medicine. Several regimens have been used by *Unani* physicians, among which *Dalak* (massage) is the most common and widely practiced method that is used restorative, preventive as well as therapeutic purposes.

The word 'massage' is derived from the Arabic word- Mass (to touch), or from the Greek word- Massein (to knead). Hippocrates used the term anatripsis, meaning to rub down and this was translated into the Latin 'frictio' meaning friction or rubbing [11]. French colonies in India first used the term "massage" during 1761-1773 and included it for the first time in 1812 in French-German dictionary. According to Oxford dictionary, in 1879 this word entered in the English literature [12].

## 2. Historical Background

The history of *Dalak* (Massage) dates back to the starting of human civilization. The massage was used principally to expel the evil spirit from the body of the patient in Babylon and Assyria. In eastern cultures, massage has been practiced since ancient times. Massage is an oldest practice, which was used almost all the civilization in the history and evidence of this are present in the several manuscript which are given below [11, 13].

Year	Concept and Contribution
2nd millennium BC	The 1 <sup>st</sup> description of massage is found in <i>Ayurveda</i> – medical part of
	Atharvaveda
2700 BC	Description of massage found in a Chinese book "The Yellow Emperor's
	Classic of Internal Medicine"
Asclepius (1200 BC)	Asclepius used massage for relieving pain
907 – 619 BC	First time Tang Dynasty recognized massage as a part of medical practice
Hippocrates (460 – 375 BC)	Buqrat has prescribed a combination of massage, proper diet, exercise, rest,
	fresh air and He was the first man to discuss the qualities and contraindications
	of Massage
Celsus (1st century)	Celsus wrote an eight volume book "De Medicine" and in the 7th volume he
	clearly deliberated the use of rubbing and massage in prevention and
	Therapeutics of some ailments
Galen (125 – 195 AD)	Galen wrote about 16 books related to exercise and massage
Avicenna (980 – 1037 AD)	The great physician Avicenna discussed the various types of <i>Dalak</i> in the 1 <sup>st</sup>
	Vol. of "Cannon of Medicine"
Ambroise Pare	Advised the application of massage to surgical patients
(1510 – 1590 AD)	
Fabricus Ab Aquapendente	Fabricus was the teacher of William Harvey wrote a book on massage
(16th century)	
Nicholas Andry (1741 AD)	Nicholas Andry in his book "L'Orthopedie" has mentioned effects of massage
	on the Circulation and the skin colour

Per Henrik Ling(1776 AD)	His system (Swedish massage) was based on the study of Gymnastics and Physiology and on the techniques acquired from China, Egypt, Greece and Rome
Estraderf (in 1863 AD) and Mezger (in 1868 AD)	Two doctoral Theses were written on massage

# 3. Unani Concept of Massage

Dalak is one of the very important regimes among the procedures of *Ilaj Bil Tadbeer* for neurological and musculoskeletal disorders.

In *Unani* medicine, *Dalak* is considered as the method where pressure or friction, kneading, rubbing, tapping, pounding, vibrating or stimulating against the external soft parts of the body with hands or other objects like rough cloth with or without oils, creams, lotions, ointments or other similar preparations [13]. Hippocrates (460 BC–370 BC), the father of medicine, stated that "The physician must be experienced in many things, but assuredly also in rubbing, for things that have the same name have not always the same effects. For rubbing can bind a joint that is too loose, and loosen a joint that is too rigid, rubbing can bind and loosen". He prescribed a combination of massage, proper diet, exercise, rest, and fresh air etc. to restore the health [14].

According to Ibne Rushd, massage is a type of exercise and used for the removal of waste metabolites of digestion (*Hazme Uzwi / hazme akheer*) [15]. Number of *Unani* physicians advocates the use of *Dalak* for the preventive as well as the curative purpose in various diseases. They recommended several varieties of *Dalak* e.g. *Dalak e sulb* (hard massage), *Dalak e layyin* (soft massage), *Dalak kaseer* (prolonged massage), *Dalak moatadil* (moderate massage) etc. Hard friction or massage is *Mufatteh-e-Sudad* (deobstruent) and makes the body firm. Soft massage is sedative and relaxes the body while prolonged massage reduces the fat of the body; moderate massage develops the body as well as improves and maintains blood circulation of the particular organ; rough friction with a rough cloth (*Dalak khashin*) enhances vasodilatation of the particular organ etc. [16].

## 4. Mechanism of Action of Massage

According to Unani Medicine the mechanism of action of *Dalak* (Massage) is based on holistic approach of two fundamental concepts i.e. *Tanqiyae Mawad* (Evacuation of morbid humour) and *Imalae Mawad* (Diversion of humour). *Tanqiyae Mawad* means the resolution and excretion of morbid humors and excess fluids from the body, thereby maintaining the homeostasis in the quality and quantity of four bodily humors, which is actually responsible for the maintenance of normal health. *Imalae Mawad* refers to the diversion of the morbid fluids from the site of affected organ to the site where from it is easily expelled out from the body tissues. It also induces sedation, analgesia and increases blood circulation [17].

#### 5. Classification of Massage

In Unani system of medicine various kinds of massage has been recommended for different purposes. **Ibne Sina** and **Ibne Rushd** have classified *Dalak* as *Dalak Baseet* and *Dalak Murakkab* and they again divided the *Dalak Baseet* on the basis of kafiyat (quality) and kammiyat (quantity) into 6 types [15, 16].

# 5.1. Dalak Baseet (Single Massage)

On the basis of **Kaifiyat** (pressure exerted on the part) and **Kammiyat** (duration of massage) it is again divided into six types:

## On the basis of Kaifiyat

## (i) Dalak Sulb (Hard Massage)

It is a type of massage where firm pressure is applied while stroking is done with hands.

## (ii) Dalak Layyan (Smooth Massage)

In this type, massage is done slowly and softly with hands, without exerting much pressure.

## (iii) Dalak Moatadil (Moderate Massage)

In this type of massage pressure is applied moderately between Sulb and Layyan.

## On the basis of Kammiyat

## (iv) Dalak Kaseer (Prolonged Massage)

This type of massage is done for longer duration.

## (v) Dalak Qaleel (Short Massage)

This type of massage is done for shorter duration.

## (vi) Dalak Moatadil (Moderate Massage)

The duration of this massage is in between Kaseer and Qaleel.

#### Dalak Murakkab (Compound Massage)

Dalak Murakkab is the combination of different types of Dalak and it is divided in to nine types [15, 16].

- Dalak Sulb Kaseer
- Dalak Layyan Kaseer
- · Dalak Moatadil Kaseer
- · Dalak Sulb Qaleel,
- Dalak Layyan Qaleel
- Dalak Moatadil Qaleel
- Dalak Sulb Moatadil
- Dalak Layyan Moatadil
- Dalak Moatadil Moatadil

Apart from the above varieties of massage there are also few other types of massage like:

## Dalak Khashin (Rough massage)

This type of massage is done with a rough piece of cloth. It draws the blood rapidly to the surface.

## Dalak Amlas (Gentle Massage)

This type of massage is carried out softly with hands or soft piece of cloth. It increases blood flow in the treated area.

## Dalak Istedad (Preparatory Massage before Starting Exercise)

(Qawi, zaeef, moatadil, taweel, qaseer, and moatadil) it is a special type of massage which is done gently in the beginning and then vigorously towards the end. It is done before exercise in order to prepare the body for undergoing different movements during exercise.

## Dalak Isterdad (Relaxing Massage)

It is also known as Dalak Musakkin. It is done towards the end of exercise and should be carried out gently and in moderation, preferably with oil [16, 18].

## 6. Purpose of Dalak

After describing the various kinds of *Dalak*, Ibne Sina has also mentioned the purpose of different types of *Dalak*:

- To make the body firm, if it is loose and flabby; to soften it, if the body is hard and vice versa;
- To eliminate the *rutoobat* (fluid) from the body that is left after purgation;
- To develops the body as well as to improve and to maintain blood circulation of the particular organ;
- For dissolution of *riyah* (morbid gases) from the body;
- To remove the barid mizaj (cold temperament);
- For imalah (to divert the matter from one organ to another);
- Massage is done by using oil with an aim to retain the *rutoobat* (moisture of the body);
- Massage is done to relieve pain [19].

## 7. Time of Massage

In *Unani* literature physician has emphasized more on the time of massage. It is very important to know when massage has to be done for better benefits and good results, and also to avoid the adverse consequences. Time of massage depends on the type and nature of massage required.

According to Unani literature

- Massage should not be done immediately after taking food.
- Massage should not be done in empty stomach.
- It should be done in the morning.
- It can also be done in the evening but 3-4 hours after lunch.

Time of massage also differs according to changes in weather, in *Mausam e rabee* (Spring season) and *Mausam e khareef* (Autumn) massage should be done at Noon, in *Mausam e Saif* (Summer season) massage should be done in the morning, and in *Mausam e Shitaa* (Winter season) in afternoon [19].

#### 8. Duration of Massage

In *Unani* literature duration of massage is not exactly mentioned in terms of minute or hours, but it has been extensively discussed depending upon various conditions as follows:

- · Strength of organ,
- Mizaj of organ to be massaged
- Type of oil used

- Mizaj of disease
- Mizaj of person
- Condition of disease (acute, sub-acute, chronic)
- Condition of patients (obese, lethargic, lean, healthy)
- Seasons
- Desired outcome
- Temperature of the massage cabin

#### 8.1. Other Factors

- In healthy individuals with no pains just for relaxation: massage for 30 to 40 minutes;
- In pains and aches: for longer duration;
- In physically weak: 15-20 minutes in beginning slowly then increased to 30-35 minutes;
- For those who are habitual to it, daily massage: 25-30 minutes;
- Old people need massage for one hour or more [12].

## 9. Physiological Effects of Massage

## 9.1. Increases Venous and Lymphatic Flow

According to Paikov (1986), the human body contains 1200-1500 ml of lymph moving at the speed of 4 mm/sec and massage increases these to eight folds. The contraction of the skeletal muscles compresses the blood vessels and exerts a pressure on the fluid present inside. This increase in intravascular pressure stimulates the contraction of the smooth muscles present in the wall of the vessels. Contraction of smooth muscles further increases the pressure inside the vessels. When this pressure increases beyond the threshold, the valves open up and the fluid moves into the next segment.

#### 9.2. Increases Arterial Blood Flow to the Muscle and Skin:

A moderate, consistent and definite increase in the arterial flow is observed.

## 9.3. Assists Removal of Secretions from Lungs

Percussion and vibration techniques of massage assist the removal of secretions from the larger airways.

## 9.4. Assists in Removal of Wastes Products of Metabolism

Massage speeds up the lymphatic and venous flow, which promotes rapid disposal of the waste products of metabolism.

# 9.5. Increases Excitability of Alpha Motor Neuron

The tone of muscle is maintained by the activity of muscle spindle. Muscle spindle contains the intrafusal fibres supplied by gamma motor neurons and lies parallel to the extra-fusal fibres of the muscles that are supplied by the alpha motor neurons. The capsules of muscle spindle are attached with the extra-fusal fibres. Any stretch to the muscle spindle, either by activation of gamma motor neuron or by passive mechanical procedures, activates the reflex arc. The impulse travels via the afferent nerve fibers and propagates towards the spinal cord. Some impulses are mono synaptically

transmitted to the alpha motoneuron of the same muscle. The activation of alpha motor neuron produces contraction of the extra fusal fibres of the muscles.

- **9.6.** It has been claimed that petrissage or massage in which muscles are kneaded can exert an inhibitory effect on motor neuron. Deep rhythmic massage with pressure, over the insertion of muscles has been proved effective in some cases of spasticity.
- **9.7.** Modulates psychosomatic arousal.
- 9.8. Breaks the soft tissue adhesions.
- 9.9. Accelerates various metabolic processes.
- 9.10. Increases gaseous exchange across pulmonary capillaries.
- **9.11.** Increases activity of sweat and sebaceous glands [11, 20, 21].

#### 10. Indications of Dalak

In *Unani* System, *Dalak* is recommended for both preventive and therapeutic purposes.

## 10.1. For Preventive Application

#### In Children

Children start walking in their 3<sup>rd</sup> year of life (early days of childhood). They should be massaged lightly when they wake up from the sleep in the morning and be given bath [15]. It boosts immunity and endows strength to the bodily organs.

## In Youngsters

On completion of digestion of meal the whole body should be massaged slowly with *Roghan-e-Zaitoon Shireen* (sweet olive oil). The purpose of this application is to prepare the body for exercise, as exercise before massage leads to the hardness of skin pores and results in the stagnation of waste metabolites which should excreted through skin. Oil dissolves the waste metabolites and evacuates them. After exercise, body is massaged with firm hands for two purposes: (1) to evacuate the stagnant waste metabolites in subcutaneous tissues. (2) To make body muscular and strong. Galen has said that hands should be moved in such a way that it simultaneously covers the whole body so as to dissolves the morbid materials [15].

# In Elderly Person

In elderly persons moderate massage is very effective if done with oils, it may be done twice a day in lean and thin persons [16].

## In Pregnant Women

It is strongly recommended to massage back, abdomen and pubic area, few days before the delivery with *Roghan-e-Zanbaq* and *Roghan-e-Kheeri* as it helps in easy passage of foetus at the time of delivery [8].

#### 10.2. For Therapeutic Application

#### In the Treatment of Pain

To relieve pains the affected part of the body should be massaged softly for a longer duration [16].

## Pain Due to Galba-e-Buroodat (Excessive Cold)

Massage the affected part with Roghan-e-Nargis/Roghan-e-Sosan mixed with Dhatoora oil [22].

## Pain Due to Galba Haraarat (Excessive Heat)

Dalak should be done with Roghan-e-Hina [22].

#### Acute Neurologic Pain

Turkish bath, local massage of *Roghan-e-Sosan, Roghan-e-Nargis* and *Roghan-e-Gaar* relive the neurologic pain and flaccidity [22].

#### Headache

In Suda Haar, apply Roghan-e-Banafsha on soles and in Suda Baarid apply lukewarm oils on the scalp and massage for few minutes [23].

## 10.3. Nervous System

#### Hemiparesis

Massage the affected side of the body with Roghan-e-Qust daily [8].

## Laqwa (Bell's palsy/ facial paralysis)

Massage should be done firmly with *Roghan-e-Qust* on face and cervical vertebrae [8]. If *Laqwa* (facial paralysis) is due to *Yaboosat*, massage the head with *Roghan-e-Banafsha* and cervical vertebrae with *Roghan-e-Khatmi* [22]. The ancient Greek physicians used sore vinegar boiled with mint or Sa'tar to massage on facial muscles, temporal area, neck and back for the treatment of *Laqwa*. The logic behind this therapy was that vinegar by its far-reaching effect removes the thick humors struck in the muscles [22].

# Tashannuje Muzmin (Chronic Spasm)

Apply lukewarm Roghan-e-Banafsha or Roghan-e-Kaddu on affected parts [8].

## Sarsaam (Meningitis)

Massage the scalp with vinegar mixed with Roghan-e-Banafsha and milk [8].

## Irqun Nasa (Sciatica)

Apply *Roghan-e-Kunjad* in the portions inflicted with the symptoms [18]. Local application of *Roghan-e-Sosan* is also described by Razi [8].

## Sakta (shock)

In shock apply warm tempered oil with sulphur on the whole body [22].

## Sidr (vertigo)

At the time of attack hold the limb tightly and massage them [22].

## Malikholiya (Melancholiya)

Massage the ribs with olive oil and Roghan-e-Sosan softly with hands on the abdomen [22].

## Muraaqiyya (A type of Melancholiya)

First give bath and then apply Roghan-e-Banafsha and Roghan-e-Gul on the scalp [22].

## Fasad-e-Zik'r (Dementia)

If it is resulted from excessive *Buroodat* and *Yaboosat*, then apply *Roghan-e-Khiri* and *Roghan-e-Sosan* on the scalp daily for the best results [22].

## Ikhtelaaj (Fasciculation)

This is commonly caused by excessive intake of chilled beverages, cold producing agents, cold weather and cold temperaments. So, on its infliction, massage the face with *Roghan-e-Farbiyoon* and *Roghan-e-Aaqar Qarha* [22] or massage with olive oil mixed with sulphur [24].

## Sara (Epilepsy)

During episodes of fits, massage the spasmodic body parts with oils, water and emollients. At first massage the whole body, then lower portion of head and cervical vertebrae [22].

## Mustarkhi Mafasil (Flaccid Joints)

Massage with Roghan-e-Qust as it has potential effect in the management of flaccid joints [22]. Roghan-e-Qust mixed with Roghan-e-Zaitoon shows very good results [22].

# Istirkhaa (flaccidity)

Apply Roghan-e-Sosan and Roghan-e-Nargis daily. It should be stopped when the affected part turns red. Besides this, massage with Olive oil, Natroon and Qand is said to be very effective in its management [22].

#### The Acute Management of Paralysis

Massage the body with *Roghan-e-Qust* and *Aaqar Qarha* with firm hands on affected parts of the body [22] massage the flaccid and paralysed joints with *Roghan-e-Qust*, *Farbiyoon* and *Miya* firmly till they turn red [22]. *Roghan-e-Qust* should be applied on the insertion points of the flaccid muscles [22].

## R'asha (Tremor)

According to Descorides, taking *Jund bedastar* orally or rubbing it on the manifested parts is very useful. Galen has also used the same for the tremor patients [22].

# Khidr (Paraesthesia)

In khidr, massage the diseased part with Roghan-e-Farbiyoon mixed with Castor oil and hot wax [22].

#### Tashannuje Haad (Acute Spasm)

Acute spasm can be managed by bringing the extended and spasmodic parts to their original positions and massage them with *Roghan-e-Suddab* and *Roghan-e-Qisa-ul-Himaar* [22] or massage with olive oil mixed with sulphur [24].

*Jund bedastar* is the drug of choice in all the diseases of nervous system which are caused by excessive *Buroodat*. Its oil should be utilized for *dalak* on the whole body as it stimulates the motor system [22].

## 10.4. Respiratory System

#### Nafsuddam (Haemoptysis)

Massage with lukewarm astringent oils on the chest to arrest the bleeding. If it is caused by *Nazlavi* material-morbid phlegm collected in the head, then apply lukewarm oil or *Roghan-e-Qisaa-ul-Hemaar* [22].

# Zeequnnafas (Asthma)

If the cause of **Zeequnnafas** (Asthma) is *yaboosat* (dryness), then massage the lateral parts of the thorax with *Roghan Naardeen, Roghan Gaar, Roghan suddab* and hot temperament oils to alleviate the symptoms of asthma [25].

# 10.5. Musculoskeletal System:

## Nigras wa Wajaul mafasil (Gout & Arthritis)

Soft massage daily with Roghan-e-Sosan is very useful in these conditions [8].

# Waja-ul-Unq (Cervical Spondylosis, Frozen Shoulder)

Massage the affected areas with Roghan-e-Shibbat, Roghan-e-Baboona and Roghan-e-Murakkab [24].

#### Waja-uz-Zohar and Waja-ul-Warik (Backache)

Apply Roghan-e-Joz Ma'sil, Roghan-e-Tukhm-e-Injeer, Roghan-e-Qurtum and Roghan-e-Qust firmly with hands [26].

## Wrist Joint Pain /Carpel tunnel syndrome

Local application of *Roghan-e-Haft Barg*, *R.babooba and R. murakkab* softly with hands is very useful in such pain [16].

#### 11. Miscellaneous

#### For the Generalized Weakness

The whole body should be massaged softly with hands daily in the morning with *Roghan-e-Zaitoon* (olive oil) and hot wax. It rejuvenates as well as awakens the dormant *Quwatt-e-Jaaziba* (absorbant faculty) of the body parts [16].

#### In Swollen Limbs

Boil Zoofa Khush'k, Kamoon and Sa'atar in Roghan-e-Naardeen and massage on the affected limbs [27].

#### In Sexual Disorders

It is very effective to do massage on male sexual organ with certain oils like: Roghane Soosan, Roghane Zambaq, Roghane Nargis, roghane yasmin, Roghane Kheeri, Roghan Punba Dana with Agar Qarha etc. in different conditions [26].

## 12. Scientific Repots

- > Zarnigar et al. conducted a study entitled, "role of Dalak and Riyazat in the rehabilitation of patients with post stroke hemiplegia", the results of Dalak showed significant effect in improvement of Fugl Meyer upper limb score [28].
- A study was carried out by Haji Amanullah *et al.* "to evaluate the efficacy of massage with *Roghan Seer* in motor recovery in hemiplegia secondary to ischemic stroke". They reported that the massage with test drug has significant improvement in voluntary movements and basic mobility of the lower limb [29].
- ➤ Lone A.H. *et al.* in a case study have evaluated the efficacy of massage with different oils in various musculoskeletal and nervous disorders; they concluded that massage may be used effectively in various disorders specially musculoskeletal and nervous disorders where medical treatment is of less value [17].
- A study was conducted on 'Effect of *Dalak Layyan kaseer* with *Roghane Shibbat* in slowing the progress of *Wajaul Unuq* (cervical pain)' in NIUM Hospital. The regimen was found highly significant both statistically and clinically in relieving acute and chronic cervical pain [30].

## 13. Conclusion

Dalak which is still popular among people throughout the world as a cosmetic and relaxant therapy in spa and beauty centers, very few know about its therapeutic values. The main purpose of this article is to make aware and update the knowledge of ancient art of massage of *Unani* medicine, beginning from history to the present era. From the above discussion it can be concluded that *Dalak* plays an important role in maintaining normal health, it is beneficial in both preventive and curative regimen. *Dalak* is used effectively for the management of musculoskeletal and nervous disorders where medical treatment is of less value. As most of the *Unani* physicians has described and mentioned about the timings, types and purpose of *Dalak*, its importance and how it differs from person to person according to age and need. By *Tanqiyae Mawad* (Evacuation of morbid humour) and *Imalae Mawad* (Diversion of humour) *Dalak* removes toxins from the body and enhances the blood circulation and there by helps in restoration of health. The efficacy of *Dalak* have been proved by many scientific studies, however still more studies should be conducted to validate its mechanism of action by modern parameters with different techniques and pressures applied in different types of *Dalak*.

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