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Review

Applications of Massage in Children from the Perspective of Persian Medicine

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Abstract

In Persian medicine (PM), massage is one of the principles for maintaining health. This study presents the viewpoint of PM about massage in pediatrics and the scientific evidence for its efficacy. The PM textbooks including Canon of Medicine, *Mufarrah al-qulub, Kholase-alHekmah, Kholase-al-Tajareb, Tadbir al-hobali val atfal va-sebyan, Exir-e-Azam, Ehya-al-Atfal, Risalat-al-Dallakieh* were reviewed for applications of massage in children. The keywords were Dalk, Ghamz, rubbing, and massage. The effectiveness of PM recommendations for massage in modern medicine was searched in Google Scholar, PubMed, Scopus and science direct, SID, and Magiran with the keywords massage, pediatrics, and children. The selection criteria were clinical trials or reviews on pediatric massage in English or Persian language without time limitation. Applications of pediatric massage in PM which scientific articles approve their efficacy include facilitating the growth, development, and weight gain, reducing muscle and joint pain, relieving colic and bloating, helping to treat skin dryness, and convulsion. Other applications including sore throats, colds, vomiting, and eye aberrations are needed to be evaluated in clinical studies.

Keywords: Massage; Pediatrics; Child; Traditional medicine; Persian medicine

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Introduction

Massage is a therapeutic method that dates back to the prehistoric period and has been used by therapists in various ways [1]. Massage has a prolonged history in traditional Chinese and Indian medicine and some types of massage, such as Swedish massage, have been used frequently in western countries in recent decades [2].

The efficacy of massage has been studied to control disorders such as depression, anxiety, insomnia, pain, and increasing immunity in adults [3].

Massage is also an important issue in pediatrics, and its effects on immunity, weight gain, cerebral palsy, developmental disorders, asthma, and some other diseases have been evaluated in children [4].

In Persian medicine (PM), massage is divided into "Dalk" (rubbing) and "Ghamz" (squeezing with the fingers) and is a subset of exercise. It is one of the principles of maintaining health (*Hifz-ol-Sihhat*) and also is an important practice in the treatment of diseases [5].

Masters of PM have stated several mechanisms of effects for exercise and massage, which include cleansing the body from the waste materials and keeping the body's excretory pathways active, preparing members to receive food, and increasing the basal energy. In fact, the main effect of exercise or massage is increasing the body's core temperature, improving the metabolism and the function of the body organs, assisting to better absorption of food and excretion of waste substances [6].

In the field of treatment, massage is generally used to cope with the dominance of cold temperament and excess body moisture, which causes some kind of disorders in the body organs [6].

Hundred years ago, the masters of PM were aware of the importance of massage in children and made some important recommendations in this regard. Therefore, this study has been conducted to review the applications of massage in the prevention and treatment of pediatric diseases from the perspective of PM.

Methods

The PM textbooks including, *Mufarrah al-qulub* (11th and 12th AH) [7], *Kholase-al-Hekmah* (12th AH) [8], *Risalat-al-Dallakieh* (13th AH) [9], *Ehya-al-Atfal* (14th AH) [10], *Kholase-al-Tajareb* (10th AH) [11], *Tadbir al-hobali val atfal va-sebyan* (4th AH) [12], *Exir-e-Azam* (13th AH) [13], *Canon of Medicine* (11th AH) [14] were reviewed with the keywords of Dalk, Ghamz, rubbing and massage. The review was continued until data saturation. After determining the applications of massage in children from the perspective of PM, the effectiveness of massage in modern medicine was searched in Google Scholar, PubMed, Scopus, and science direct with the keywords of massage, pediatrics, and children. The Persian language databases (Magiran and SID) were also searched with the equivalent Persian keywords. The selection criteria were clinical trials or systematic reviews on pediatric massage in English or the Persian language without time limitation.

Results

1- Persian medicine and massage in pediatrics

In PM, the first stage of life is named 'hedasat" which is up to 30 years and is classified into the following age groups:

1. Tofuliyat: when the baby is not yet ready to move and stand;
2. Sebabat: when a child stands, but the organs of the body are not strong enough;
3. Taraaro: after limb strengthening and teething, and before puberty;
4. Bolugh: when the signs and symptoms of puberty appeared and
5. Fata: the beginning of youth when the growth and development stops [11,14].

In PM literature, massage for children has been explained generally, and it was not separately explained for each age group.

Massage in children should be done gently because strong and intense massage causes the body to lose moisture, which is necessary for the growth of the child [14].

Massage has been recommended since infancy to strengthen the body [14].

Bathing is considered a very beneficial passive movement for children. It is said to have a physical (natural) and mechanical (stimulating) effect, and it can promote the growth and development of the body through increasing the blood flow in the body organs and improving their nutrition and basal heat [10].

The baby can be rubbed every 2-4 days during washing and after drying. Rubbing and gently squeezing could be done with a finger on the limbs, the abdomen, and then on the back. It is also recommended rubbing the baby with oil after a bath up to 2-4 months of age (for boys and girls respectively) [7,12]. The recommended oil is cow oil for boys and violet or almond oil for girls [7,8]. Some have considered the oil-free massage to be enough and recommended rubbing the baby with a thin cloth for a few minutes after bathing [10].

Rubbing (Dalk) the back muscles help to decrease the pressure on the back and relieve the muscle stiffness and cramps caused by excessive immobility which is a cause of crying and restlessness of the baby. Massage could help the baby to sleep [7,8,11].

Moving the baby in a cradle is also a kind of massage. Using a cradle is recommended after 3-7 days after birth (some said 40 days after birth). It must be done after breastfeeding, the baby's head must be higher than the body, and it also should not be shacked intensely so much that it causes mal-digestion [7,8,12].

Dalk is one of the recommendations for abdominal pain, bloating, and vomiting.

In the case of vomiting, Dalk of the stomach with oil is recommended when the stomach is empty [12].

When excessive thirst is occurred in infants due to the presence of too much milk in the baby's stomach, it is necessary to remove the extra milk from the baby's stomach with Dalk [12].

At the time of tooth extraction, a gentle Dalk of the gum with fingers is recommended [12].

In gingival swelling, Dalk of the gums decreases the materials and swelling disappears [7].

When the child begins to speak, Dalk of the tongue with honey and salt is recommended [12].

When children begin to walk, Dalk is recommended daily, along with exercise and bathing

after waking up and at the end of the day before feeding the child [14].

If the child's walking is delayed, rubbing the foot with oil and washing the feet with cold water in the bath is said to be helpful [13].

In the case of convulsion, Dalk is one of the recommended treatments for contracted muscles [7]. Also, Dalk is recommended as a treatment for convulsion in children (Omme Sebiyan) [11]. Dalk with warm-tempered oils, such as chamomile oil, is recommended for muscle or joint pain in children [7].

In skin dryness, which occurs in children and is considered equivalent to skin eczema, Dalk is one of the most common recommendations [12,13].

In eye deviation, Dalk of soles of the feet is recommended [13].

A gentle Ghamz is recommended on the child's bladder two or three times a day so that the urine is completely emptied from the bladder and taken out easily (although the child's age is not mentioned) [7].

When a child has a cough or cold, frequently rubbing the outside of the throat using honey and Ghamz of the end of the tongue with a finger is recommended [13,14].

2- Massage in conventional medicine

Some applications of pediatrics' massage in PM have been approved scientifically (Table 1).

Table1- comparison between Persian medicine and conventional medicine for pediatrics' massage

applications of massage	traditional medicine	Conventional medicine
improves nutrition	√	√
development of the body	√	√
growth	√	√
helping to speak	√	
Improve muscle tone	√	√
colic	√	√
cough	√	√
cold	√	√
convulsion	√	√
Muscle and joint pain	√	√
skin dryness	√	√
sleep	√	√
deviation of the eyes	√	
tooth extraction	√	

In the case of growth and weight gain, some studies have been done on preterm infants [16].

A review article has collected the studies of massage on weight gain in preterm infants and concluded that a moderate-intensity massage can increase the weight of low birth weight infants [17]. Fallah *et al*. observed that moderate massage with sunflower oil has a better effect on weight gain in preterm infants [18].

In full-term infants, most of the massage studies focus on reducing bilirubin and improving sleep, and relieving colic because these problems are common in these infants [19].

Regarding the effect of massage on motor development, a clinical study in 2019 on 1 to 3-year-old children with developmental delay showed that massage accelerates the process of motor and sensory development [20].

In infant colic, a review study conducted in 2016 concluded that massage relaxes the gastrointestinal tract and improves digestion, reduces the gas, and helps the infant to be calm and sleep [21]. Another study in 2019 also confirmed this effect [22].

Besides, the effect of massage on nausea and vomiting in children undergoing chemotherapy has been presented [23].

Massage has also been shown to be effective in chronic constipation [24], and a meta-analysis has shown a greater effect of massage on diarrhea than medication [25].

The effect of massage on muscle strain was evaluated in congenital torticollis and the effect of traditional Chinese massage therapy on the treatment of these children was confirmed, but there was not a significant difference between this type of massage and the stretching therapy [26].

Studies have also shown an improvement in muscle tone following massage in cerebral palsy (hyper-tonicity) [27] and Down syndrome (hypo-tonicity) [28].

The effect of massage on reducing pain and increasing quality of life in children with cancer has been shown as well [29].

Numerous studies have been conducted on the effect of massage on children's sleep, which has been collected by Field *et al* [4,30].

Regarding the effect of massage on skin disorders, the effect of massage on improving redness, scaling, and itching in children with atopic dermatitis has been presented and the effect of massage on reducing distress in burn dermatitis has been shown [31,32].

Massage and herbal supplements are the most commonly used alternative therapies in epileptic patients [33]. There have been studies that have shown that relaxation techniques and massage decrease seizure frequency. Massage therapy promotes relaxation and helps to relieve stress which could be a possible trigger of some seizures [34,35].

Other applications of pediatric massage including asthma, diabetes, neonatal hyper-bilirubinemia, PTSD, ADHD, eating disorders, learning disorders, and cystic fibrosis which have been evaluated in scientific studies [4] were not relevant to the objectives of our study.

Discussion

In the present study, applications of massage in children were reviewed in PM literature.

From the perspective of PM, massage with different mechanisms is effective in preventing and treating diseases. The most important mechanisms of massage seem to be the excretion of concentrated waste substances from the organs, local strengthening, and warm-up of the organs, and absorption of blood and nutritional materials into the massage site [15].

Increasing the blood flow following the massage seems to be a factor for enhancing the growth of the child [15].

Now we have evidence that show increasing vasodilation and temperature after the massage. Diego et al. showed the effect of massage on increasing the temperature of preterm infants, which occurs as a result of increased blood flow [36].

The effect of massage on the growth of preterm infants has been studied in conventional medicine, and it has been shown that massage stimulates ornithine decarboxylase, which is an important enzyme in protein synthesis. Massage also relieve stress in the baby and decreases cortisol levels, increases gastrin, insulin, and cholecystokinin, and improves digestion and absorption in the gastrointestinal tract. Weight gain is also due to improved metabolic efficiency and is associated with increased fat, muscle, and bone mass [37].

Another study has noted an increase in insulin and IGF-1 through the celiac branch of the vagus nerve after the massage. In general, there is a significant correlation between IGF-1 levels and weight gain and body length. IGF-1 levels are low in preterm infants and increase after a massage [38].

In addition, increased gastric activity through the gastric branch of the vagus nerve after massage and its role in weight gain has been shown. [38].

The difference between exercise and massage and the different mechanisms of them should be considered. Exercise in infants includes flexion and extension of the arms and legs.

Diego *et al.*, compared massage with exercise in infants. The results showed that both of them caused weight gain, but with two different mechanisms. Exercise caused energy consumption and reduced vagal activity in the heart, while massage increased vagal activity in the heart and gastrointestinal tract, which in turn increased the weight. In fact, exercise caused weight gain through energy expenditure and massage did it with vagal stimulation. In addition, moderate pressure has a greater effect on weight than light pressure [39].

From the perspective of PM, massage reduces the wind [15], and with this mechanism, it is helpful in infant colic. In studies on neonatal colic, abdominal massage improved neonatal colic with the mechanism of stimulation of parasympathetic activity and increasing the gastrointestinal response. Abdominal massage also reduces abdominal distension and increases bowel movements by increasing intra-abdominal pressure and creating a mechanical and reflex effect on the intestines [40].

In respiratory and skin diseases, massage appears to help improve symptoms by the expulsion of concentrated substances from the organ. Massage could significantly improve lung function, but its mechanism is not understood [41].

Also, in atopic dermatitis and other skin allergic problems, the effect of massage has been proven [42].

In PM, strains or spasms in the muscles are presentations of the excessive cold temperament of muscles, and massage therapy is used to treat them by creating local heat [15]. This could be the mechanism of action of massage in the treatment of muscle aches or spasms.

Following the massage, parasympathetic activity is increased, and serotonin is secreted, which in turn causes analgesia in the body [3].

In moderate pressure massage, increased parasympathetic activity increased serotonin, and decreased substance P occur which are effective in controlling pain.

In addition, a decrease in cortisol, an increase in the number of natural killer cells and an increase in the activity of the immune system will occur after massage [3].

Improving the function of the hypothalamic-pituitary-adrenal axis and improving the function of the organs is also mentioned as another mechanism of the massage effect [43].

Functional magnetic resonance imaging data showed that a moderate pressure massage affects multiple areas of the brain, including the amygdala, hypothalamus, and anterior cingulate cortex and areas affected by stress and emotion regulation [3].

The use of Ghamz in children is much more limited than in adults, and no scientific studies have been found in conventional literature.

In most review studies, different types of massage have been studied, and there are very few studies with appropriate methodological quality.

Besides, the long-term effects of massage on different diseases also need to be further investigated.

The side effects of massage on children must be evaluated. In one case report, topical spreading of osteosarcoma was reported following massage [44], and metastasis was reported in another study [45].

In a systematic review of massage in adults, disc protrusion, soft tissue trauma, neurological disorder, spinal cord injury, rupture of spinal vessels were the main reported complications [46].

Conclusions

Massage is one of the principles of maintaining health from the perspective of PM. Although many scientific studies approved the effect of massage in children, more scientific studies should be done to assess the efficacy and safety of this therapeutic method.

Conflict of interest

There is nothing to declare.

Authors' contributions

F.HD, conceptualized the study. F.B. conducted the search and drafted the manuscript. FHD revised and finalized it, and tracked the publication process.

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