



Massage therapy research review



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ABSTRACT

In this review, massage therapy has been shown to have beneficial effects on varying conditions including prenatal depression, preterm infants, full-term infants, autism, skin conditions, pain syndromes including arthritis and fibromyalgia, hypertension, autoimmune conditions including asthma and multiple sclerosis, immune conditions including HIV and breast cancer and aging problems including Parkinson's and dementia. Although many of the studies have involved comparisons between massage therapy and standard treatment control groups, several have compared different forms of massage (e.g. Swedish versus Thai massage), and different active therapies such as massage versus exercise. Typically, the massage therapy groups have experienced more positive effects than the control or comparison groups. This may relate to the massage therapy providing more stimulation of pressure receptors, in turn enhancing vagal activity and reducing cortisol levels. Some of the researchers have assessed physical, physiological and biochemical effects, although most have relied exclusively on self-report measures. Despite these methodological problems and the dearth of research from the U.S., the massage therapy profession has grown significantly and massage therapy is increasingly practiced in traditional medical settings, highlighting the need for more rigorous research.

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Since a rather extensive massage therapy research review by Field was published in 2014, a significant literature has amassed on massage therapy effects on a variety of conditions that are reviewed here [1]. Empirical studies, systematic reviews and meta-analyses on massage therapy effects were found on a Pubmed search for the years 2013–2016. The studies were evaluated for treatment integrity, sample size and reliability of measures. Of the 159 studies that were initially selected for review, 79 were excluded because the entire article could not be located or the full paper was in a foreign language or the research failed to meet the criteria of being an empirical study (single-arm, randomized controlled waitlist or treatment comparison), a systematic review or a meta-analysis. Qualitative studies, case studies and small sample size studies were excluded. The final selection included 9 single-arm studies, 48 randomized controlled trials, 3 systematic reviews and 5 meta-analyses (see tables). These were focused on a variety of conditions including in vitro fertilization, prematurity, full-term newborns, autism, skin conditions including burn scars and surgical sores, pain syndromes including fibromyalgia and arthritis, blood

pressure and hypertension, autoimmune conditions including asthma and multiple sclerosis, immune disorders including HIV and breast cancer and aging problems including menopause, Parkinson's and dementia. The empirical studies, systematic reviews and meta-analyses on massage therapy effects on these conditions are summarized here with respect to their primary findings, methodological flaws, potential underlying mechanisms, and suggested future research.

1. In vitro fertilization (see Table 1 for a listing of these studies and their primary results)

In vitro fertilization is probably the earliest developmental research involving massage therapy. In an in vitro fertilization study, oscillating vibrations were used prior to the transfer of the embryo [2]. The positive effects included greater pregnancy rates based on urine assays and ongoing pregnancies measured by fetal heart rate and birth rates as well as miscarriage rates. The problem with this study, however, was that only those who were willing to undergo the massage treatment were allocated to the massage therapy group, suggesting a potential self-selection problem. Nonetheless, it is a suggestive finding and one of the only studies on the use of massage therapy as an assisted reproduction technique.

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Table 1

Prenatal and postnatal development conditions that are improved by massage therapy: reference numbers, trial types, comparison groups and primary results.

Conditions	Reference	Trial type	Comparison group	Primary results
Prenatal Development				
In vitro fertilization	2	RCT	control	> pregnancy rates
Prenatal depression	3	RCT	yoga	<depression & prematurity
Infants				
Preterm infants	4	RCT	usual care	> weight and height
	5	RCT	non-oil	>weight
	6	RCT	usual care	>vagal activity
	7	RCT	usual care	># natural killer cells
	8	META		5–6 days < intensive care
	9	RCT	usual care	>cognitive scores (12mos)
	11	RCT	exercise	>vagal activity
	12	RCT	coconut oil	>oxygen saturation
	13	RCT	control	NICU nurses < stressed
Full-term infants	14	RCT	usual care	>attachment
	15	RCT	no lotion	>sleep patterns
	16	RCT	usual care	<bilirubin levels
	17	RCT	usual care	<need for phototherapy
	18	RCT	usual care	<cortisol levels
	19	RCT	usual care	>feeding interactions
Children				
Autism spectrum disorder	21	REVIEW		>sleep patterns
	22	Single arm		>oxytocin levels

And the researchers did control for the participants' ages, hormonal substitution protocols and quality of the transfer of embryos, and no adverse effects were noted for the massage therapy. The authors speculated that the improved embryo implantation may have related to relaxation, reduced stress as well as decreased uterine contractions and possibly increased blood flow to that region.

2. Reducing prematurity by decreasing prenatal depression (see Table 1)

We have conducted several studies showing that massage therapy by a therapist and by significant others reduces prenatal depression and in turn increases gestational age and birthweight (see Field 2014 for a review) [1]. In a recent study, massage therapy was compared to yoga, with yoga being considered a form of self-massage [3]. Both groups of prenatally depressed women became less depressed and their newborns were greater gestational age and birthweight. Despite the positive findings for both groups, the effects are confounded by yoga also being a source of social support from other prenatally depressed women in the group sessions. Despite these prenatal therapies, some depressed women unfortunately still experience preterm delivery.

3. Preterm infants (see Table 1)

3.1. Growth measures

The most frequently reported effects for massage therapy with preterm infants are their greater weight gain and earlier hospital discharge. In a recent study, massage therapy was performed twice daily for two weeks for 15 min per session [4]. In this study, weight gain, height and head circumference were significantly increased. In addition, the frequency of pre-feed gastric residual was decreased and the number of bowel movements was increased in the group who received massage therapy. The authors concluded that NICU nurses needed to be trained in massage therapy techniques so that all preterm infants could receive massage therapy.

In another recent study, preterm infants were randomly assigned to 3 different groups including an oil massage group, a non-oil massage group and a control group [5]. Medium-chain triglyceride oil was used for the oil massage group as a

nutritional supplement. The mean weight gain on the seventh day of the study was 105 g for the oil massage group, 52 g for the non-oil massage group and 54 g weight loss for the control group. The greater weight gain by the oil massage group could be related to the oil being absorbed by the skin which could contribute to the weight gain as has been reported in other studies and/or it could be related to increased vagal activity leading to greater gastric motility resulting in more efficient food absorption, as we have shown in an earlier study [1].

3.2. Vagal activity and gastric motility

The improved gastrointestinal function noted in the oil massage study just described [5] may relate to increased vagal activity leading to greater gastric motility, as has been shown in one of our studies on preterm infants [1]. In a related study on vagal activity, preterm infants were assessed for heart rate variability (vagal activity) after two weeks of twice daily massage therapy sessions [6]. The authors reported that the infants showed increased heart rate variability during caregiving, suggesting increased parasympathetic activity.

3.3. Natural killer cell activity

In one of the only studies on immune function of preterm infants following massage therapy, the researchers measured natural killer (NK) cell number and NK cell cytotoxicity (activity) [7]. Although the number of NK cells did not differ between the massage and the standard treatment control groups, the increase in NK cell activity was significantly greater for the massage group, particularly for those who received more than 5 days of therapy. The infants were also heavier and showed greater daily weight gain at the end of the study. The increased natural killer cell activity is consistent with data we have reported in other studies on massage therapy effects on individuals with immune disorders including women with breast cancer, and adolescents and adults with HIV ([1]). It is therefore not surprising that once again the immune measure most affected was NK cell activity. But given the greater NK cell activity, it is surprising that the number of infections did not differ between groups in the preterm infant study inasmuch as NK cells “kill” bacterial, viral and cancer cells. That the length of

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