Chapter 3: Marketing Research for the Massage Therapist

By: John Vinacci

Learning objectives

Upon completion of this course, the learner should be able to:

- Recognize the importance of research competency for massage therapists.
- Explain the scientific method.
- Define the different types of research.
- Identify the components of a research article.
- Summarize the consequences of not being involved with massage research.
- List the scientifically verified benefits of massage therapy.

Introduction

Stress relief, relaxation, maintaining wellness, and injury rehabilitation are among the many reasons clients seek massage therapy. Although it is widely assumed that massage therapy provides relief from stress and helps maintain the body’s wellness, it is not widely known – not even by many massage therapists – how massage provides these benefits. It can be difficult to explain to a client how the pain relief of a rotator cuff injury and increased range of motion have been achieved through massage. Moreover, if it is hard to explain to a client how massage has helped them, how can a massage therapist be certain they are using the most effective techniques? Is it ethical to ask for payment if it is difficult to explain why a particular course of treatment is chosen over another? Should a therapist be expected to be taken seriously as a professional health and wellness provider by medical institutions or insurance companies without any verification that massage therapy actually provides benefits?

Questions such as these can be answered by becoming familiar with scientific research. While the word research may appear intimidating without a background in science or mathematics, the basic premises of scientific research are simple to understand. The word research means little more than a means by which questions can be asked and answered accurately. The goal of this course is to help the learner understand how scientific research is conducted to provide accurate answers. In addition, methods are discussed to decode a research article and study it for flaws or biases that may affect the conclusions. Finally, the learner will discover what some studies have scientifically verified about massage therapy. Armed with this knowledge, the therapist can provide truthful answers to clients when asked how massage works.

What is research?

Research is specifically defined as a “careful study that is done to find and report new knowledge about something or the activity of obtaining knowledge about a subject [1].” The goal of research is to discover new facts about a new or existing question so revised or new conclusions can be drawn. To do this, scientists use a procedure called the scientific method, which uses measurements or observations to collect facts. As it relates to massage therapy, scientific research can be used to study the relationship between cause and effect. For example, does massage help reduce a client’s pain by stimulating their nervous system to release endorphins (pain-killing neurotransmitters)? To answer such a question, research must be conducted carefully so answers about certain effects can be shown to be the result of the cause that is being studied – otherwise, flawed conclusions will be drawn. Fortunately, the scientific method is self-correcting, so even flawed conclusions can eventually be revised for greater accuracy.

The scientific method

The scientific method is a step-by-step procedure for collecting information and subsequently drawing conclusions. In a best case scenario, accurate conclusions can be inferred from gathered information because the scientific method allows for the replication of an experiment to see if the information can be repeated. In a worst case scenario, either the information that is gathered may be completely unexpected due to a flaw in the execution of an experiment or a conclusion may be incorrect due to the biases of the researcher. The scientific method is meant to either confirm or deny particular questions about the way the world works, or it may lead to additional research in hopes of answering these questions.

There are generally five steps to the scientific method, which help show cause and effect. They are:

1. **Ask a question.** What is the goal? What should be discovered or confirmed?
2. **Create a hypothesis.** Given the background knowledge or study of existing information, what will happen when an experiment is performed to answer the question? Hypotheses should be stated so that results of an experiment can be measured in a way that anyone performing the experiment can get the same results.
3. **Design an experiment that can confirm or deny the hypothesis.** What variables are involved? What equipment is needed? What tools will be used to measure the results?
4. **Record and organize the results of the experiment.** This will help make analyzing the results easier.
5. **Analyze the results and draw conclusions from the data.** The data will either confirm or deny the hypothesis, or require additional results or experiments to verify a hypothesis.

As it relates to massage therapy, the scientific method may be applied in the following fashion using this fictional, but quite possibly real-life, scenario:

- Develop a question based on your observations of the world. Does massage reduce a client’s pain? If this is what clients tell you after
a massage, you can put their subjective experiences to the test. For example, if clients tell you that your trigger-point therapy helps reduce pain in a certain muscle when you press your thumb into a knot, you may ask, “If I press on a client’s muscles, what happens in their muscle or body that helps alleviate pain?” In this case, you would be trying to discover why the effect of pain reduction occurs when you apply a cause (massage). Keep in mind that the more narrow your question, the easier it will be to design an experiment later. Definitions are important as well. Exactly what particular technique is going to be used to press on a client’s muscle and thereby reduce their pain, acupressure?

- Next, develop a hypothesis. You might recall from your massage therapy training or other literature that massage affects the nervous system and that one of the neurotransmitters of the nervous system, endorphins, help reduce pain in the body. This leads you to hypothesize that pressing on a client’s muscle will release endorphins into their bloodstream. There should always be some kind of rationale behind a hypothesis, and not pure speculation.

- Third, design an experiment that will tell you what will happen in a muscle or the bloodstream when you apply a certain technique or certain amount of pressure to a person (the subject of the experiment). Here, you may wish to enlist the aid of a physician to measure blood composition and an exercise physiologist to measure your pressure (for the sake of knowing exactly what will happen when you use varying pressures). Getting help from several people who are experts in their respective fields can help minimize mistakes as well as provide varying viewpoints when it comes to interpreting results.

- Fourth, perform the experiment, collecting and organizing data. For this experiment, you might or might not see endorphins enter the subject’s bloodstream. You might see endorphins enter the bloodstream only when a certain amount of pressure is applied. You might even see a different neurotransmitter enter the bloodstream instead of the one you expected to see. It should be ensured that all the steps in an experiment are followed in order so that the experiment can be performed again or refined if necessary.

- Finally, draw the conclusions. Perhaps you did see endorphins enter the subject’s bloodstream and this explains why your clients say they feel less pain after a massage. Perhaps, though, you did not see endorphins enter the bloodstream, causing you to abandon your original hypothesis and coming up with a new one. Or, perhaps you forgot something when designing the experiment. Did you forget to time how long each instance of acupressure is applied? Forgetting even seemingly minute details of an experiment can have a profound impact on results.

In massage, an experiment such as this one can be either clinically significant or clinically insignificant. Such an experiment would be considered clinically significant if the subject’s endorphin levels rose to such a degree that their pain was reduced to a point that improved their quality of life. The experiment would be considered clinically insignificant if their endorphin levels rose only slightly and this did not do much to reduce their pain level.

Possibly the most important part of research is that the results gained from experimentation should be repeatable. If the results cannot be replicated and explained to others, the experiments will be meaningless. In the scientific community, the results and conclusions of research, known as findings, are checked in a process called peer review. The peer-review process uses people in the same or similar fields to conduct and verify findings. Every aspect of the experiment is reviewed for quality of the results and concurrence of the conclusion. Findings that have been rigorously reviewed and are considered important to the scientific community are then published in peer-reviewed journals.

Finally, an important point is that an experiment never proves anything; it simply supports or denies a hypothesis, which may lead to further questions. This is not unusual – sometimes the scientific method is a circular process.

Several types of research

There are many types of research. Generally, as it applies to massage therapy, most research currently falls into one of two types: basic research or clinical/applied research. Basic research is meant to unveil fundamental information at either the molecular, cellular, or tissue level of organization. The example used to explain the scientific method in the previous section would be considered basic research. In addition, basic research is usually conducted in a lab. Clinical, or applied, research is used to investigate questions about functions. If the previous example used the scientific method for clinical research, the mechanisms responsible for endorphin levels rising in the bloodstream when acupressure is applied to a muscle (if such were the case) would be investigated.

Other categories of research include analytical research, which offers an in-depth analysis of historical information and summaries of already completed research, and descriptive research, which analyzes surveys, questionnaires, and interviews. An example of descriptive research would be to find out which techniques are most effective for rehabilitating a rotator cuff injury. Therefore, knowing the type of research to conduct will influence how and to what extent the experiment is designed.

Variables in research

Variables can affect research studies and must be accounted for in any well-designed experiment. Often, these variables are specifically known as independent variables, which are things that can be controlled in an experiment. The independent variables in the imaginary study may include, but are not limited to, who or what is applying the acupressure, amount of time the acupressure is applied, depth or angle of the acupressure, whether the subject is standing, sitting, or lying down, and the gender and/or ethnicity of the subject. Sometimes, there are variables that can influence or corrupt an experiment. These are known as confounding variables and are things that cannot be controlled and sometimes are not considered. Examples include a subject’s general health, genetic dispositions, diet, home or work environment, or even sleeping habits. A good experiment will find a way to balance the effects of confounding variables by including a large number of subjects or using a control group that receives placebo treatments with a group receiving the actual treatments.

Another important variable is the placebo effect, which is the theory that a subject’s belief that a treatment will produce certain results actually causes the results. It is estimated that as many as 15% of all changes in a subject group during clinical drug trials are the result of the placebo effect [2]. This, too, should be accounted for when drawing conclusions from experiments (in cases where scientific experiments involve living subjects). Accounting for as many variables as possible in an experiment lends research more credibility, even when the results are not what might have expected.
Reading a scientific article

Although scientific articles vary slightly from journal to journal or between fields of study, they have a commonly accepted structure. This is to done to increase the flow of information. For example, if one wanted to see which neurotransmitters were released into the bloodstream during a massage, one could proceed directly to the Results portion of the article without having to read the entire entry. An abstract is typically provided at the beginning of scientific articles to provide a summary of all the relevant research and usually includes information about the subjects, methods used, variables, and conclusions. Abstracts are meant to be a quick-read and should be read in advance to decide whether or not to read the entire article for a more in-depth understanding of the findings. A scientific article is organized into sections, including:

- **Introduction** – provides a basic overview of the topic and includes a summary of existing research, also explains why this particular research needs to be done and should end with a hypothesis.
- **Methods** – provides details about who or what is being studied, the equipment used, how data will be gathered and organized, and a step-by-step guide to the procedure so that it can be replicated by peers.
- **Results** – reports the data that were collected.
- **Discussion** – interprets the results (with the researchers attempting to explain them), their relationship to existing research, and limitations of the experiment. This is usually the longest section because the researchers try to elaborate on why the results turned out the way they did.
- **Conclusion** – summarizes the Discussion section’s findings and the experiment’s relevance.
- **References** – lists all the existing literature relevant to this particular research; it may include references to other scientific articles whose findings were limited or flawed and/or references that help explain the findings of this research.

What follows is a fictional example of an abstract related to the field of massage therapy:

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**Does Massage Therapy Benefit Diabetes Patients? A Review.**


Enzo J, Dormer S, Nicholas M, Wilcox M.

National Diabetes Foundation; Richmond, VA.

**Abstract**

Massage therapy is one of the fastest rising complementary therapies in the United States. This article reviews the existing evidence for the benefits and adverse effects of massage for patients with diabetes. Massage performed at the injection site has been shown to increase insulin absorption. In addition, preliminary research suggests that massage may have beneficial effects on glucose levels in the bloodstream and ease symptoms of diabetic neuropathy. Nonetheless, double-blind, placebo-controlled research is needed to verify any of the short- and long-term benefits of massage as a complementary treatment for diabetes patients and to delineate specific massage treatment protocols.

Massage has been a suggested treatment for diabetes for approximately 100 years. However, the benefits of this therapy for diabetic patients remain ambiguous as exemplified on Internet chat boards and social media websites. One writer may pose questions such as, “Does massage therapy help manage diabetes?” Typical replies include, “If you find any information on massage for diabetes patients, please let me know. I want to find a therapy that can aid my 55-year-old mother who has been diagnosed with diabetes. In what way does massage help?” or “Does anyone know if massage helps all types of diabetes?”

If the persons posting these messages were to search the Internet for answers to their questions, they may become discouraged, confused, and frustrated. Internet information on diabetes and massage is rife with unverified claims. For example, one website suggests that diabetes can be cured by self-massage. Another website describes a case in which a patient with diabetes who purportedly had his feet massaged with a technique known as Reflexology, reduced vast amounts of glucose in his urine during the second week of the specified treatment; ultimately resulting in the remission of his diabetes. Given such unverified claims, how do patients or loved ones decide, or physicians advise, about the efficacy of massage therapy for those with diabetes?

This article seeks to explain what is and is not known about the efficacy of massage therapy for patients with diabetes by systematically reviewing the existing scientific literature using the Brisbane review methodology, a method explicitly aimed at maximizing comprehensiveness and minimizing bias. Using this method, all relevant studies that meet specific inclusion benchmarks are included in this article, irrespective of their results.

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It should be noted that not all research articles are considered reliable simply because they are published. On occasion, some research articles may forgo the peer-review process, thus revealing a potential bias toward a positive outcome of the conducted research. An example would be a massage therapy clinic that conducted their own in-house experiment on whether deep tissue massage can provide relief of lower back pain, then collected data that confirmed their suspicions, and released the information to their existing clients without having it reviewed by an independent researcher.

How, then, does one tell a good research article from a bad one? There are some general signs to look for when reading a research article. They include, but are not limited to:

- The article has been peer-reviewed.
- A list of references or sources that the researchers have consulted in preparing their experiments.
- A name associated with each reference or source and their credentials. There may be no name associated with the reference or material, as is often the case with Internet articles. Reputable websites typically end in “.gov” or “.edu.”
- The references or sources have been peer-reviewed.
- The references or sources have historical significance or are up-to-date.
- The article tries not to stray from facts and gives reasons for the conclusions.
- The article uses technical or scholarly language.
- Quotations or precise information from references or sources are cited within the article’s text.

Fortunately, there are several reliable search engines for finding trustworthy research articles that relate to massage therapy. A list of these search engines can be found on the Massage Therapy
Foundation’s website on the Massage Research page, and includes links to Biomed Central, MerckMedicus, and PubMed. With these search engines, it is possible to find millions of scholarly articles, science journals, online books, citations, and other media that

Research and massage therapy

The purpose of researching massage can go beyond the desire to explain a course of treatment to a client. Accurate knowledge may help better a therapist by discovering which techniques are the most and least effective for treating clients given a specific ailment. As mentioned earlier, taking a clinical approach to massage can help the therapist and the profession gain respect and enhance stature in the health and medical community.

According to renowned massage therapist Susan Salvo, as a profession, there are several things that must be done to accomplish the goals discussed in this course. First, it must be shown that massage has a positive influence on clients, making the profession important to society. Second, it must be proven that massage’s positive influence on a client is backed by scientific findings. Third, massage therapists must convey the image of a professional that conducts research and continues improving their knowledge and skills. Lastly, massage therapists should be directly involved with the research on their profession instead of letting outsiders do all of the research [4].

By not being involved in research projects, massage therapists allow their profession and its image to be defined for them. The negative consequences of not being involved in the research process will diminish the standing of massage as a legitimate form of therapy and lead to missed income opportunities from physician referrals and insurance reimbursements. Many therapists are becoming involved in the research process, which improves the quality of research done on massage therapy. As research continues to confirm much of what massage therapists have been saying about the effects of massage on the human body, funding for research is increasing from well-regarded scientific institutions such as the National Institutes of Health (NIH). Improving the quality of studies will lead to better research and will legitimize the therapist as a health and wellness provider to be compensated accordingly.

The effects of massage

While research in the exact benefits of massage is in its infancy compared with other fields of study, there are many things currently known about massage. The effects of massage can be general, in that it can provide an overall sense of well-being in a client, or specific, in that massage has been shown to relieve lower back pain. This section provides an overview of scientifically verified effects of massage therapy and the variety of techniques used to produce those effects.

It is possible to break down the effects of massage into three broad categories: mechanical, physiological, and psychological. It is important to recognize that while the effects of massage can be broken down into any one of these categories, any category may overlap with another given the complex organization of the human body.

Mechanical effects of massage result from the direct placement of hands, forearms, elbows, or feet upon a client’s body to manipulate their soft tissues (which include, but are not limited to, muscles, tendons, ligaments, and joints). Furthermore, mechanical effects are produced by pushing, kneading, rolling, rubbing, compressing, stretching, or lifting soft tissue. Mechanical effects are difficult to measure because they may overlap with either physiological or psychological effects. For example, is the loosening of a tense muscle due to its manipulation or the client’s belief that massage will have that effect? Such an effect is difficult to measure and categorize. Still, it is known that the mechanical manipulation of soft tissue can move blood and lymph around the body, reduce edema, reduce scar tissue, lengthen muscle fibers, and possibly move substances along the gastrointestinal (GI) tract.

Physiological effects relate to changes in blood pressure, changes in hormone and/or neurotransmitter levels, improved tissue oxidation, and structural changes to muscles, tendons, and ligaments. These effects are generally easier to measure as blood can be drawn and its composition examined and magnetic resonance imaging (MRI) can reveal changes to bodily structures. These effects are considered broad, affecting the entire body and promoting a client’s general sense of well-being.

Psychological effects are associated with lower stress levels and bouts of anxiety or depression. These effects are the most documented in scientific research. There is a limitation to measuring the psychological effects of massage, however, as these known effects come by way of survey, questionnaires, and client interviews. These data are difficult to translate into a numerical value, and cannot demonstrate how reliable subjects’ answers are regarding their subjective experiences. Even so, if it is known that one physiological effect of massage is that it reduces hormone levels such as cortisol and epinephrine (stress hormones), it can be deduced that one of these effects would be that a subject’s stress levels are reduced. At this point, the scope of how massage affects the human body can be looked at more precisely.

Effects of massage on body systems

Cardiovascular system

Effects of, or changes to, the cardiovascular system would generally be considered part of the physiological effects of massage. Research conducted in 2008 on 263 subjects concluded that the application of deep tissue massage had the effect of lowering blood pressure and heart rates by as much as 10 beats per minute [5]. Research conducted in 2009 discovered that the compression of trigger points in the lower leg stimulated a parasympathetic response from the nervous system, thereby reducing a subject’s heart rate. To quote the study’s abstract, “The therapeutic effects of [trigger point] compression were assessed by a subjective fatigue scale. Parasympathetic nervous activity was also assessed by spectral analysis of heart rate (HR) variability…The results indicated that [trigger point] compression (1) decreased HR, [systolic blood pressure] and [diastolic blood pressure], (2) increased parasympathetic activity, [and] improved the fatigue scores. These findings suggest that an increase in parasympathetic nervous activity after the [trigger point] compressions induced a reduction of fatigue [6].” Having shown that massage can also reduce the arterial pressure associated with the heart rate makes it valuable for patients with cardiovascular disease whether they are in the pre- or posttreatment phase of their pathology. Thus, there is no evidence to suggest that massage can invoke a cardiac event in susceptible clients. This is probably because most of the changes to the cardiovascular system stem from the stimulation of the nervous system’s parasympathetic system (the resting, or calming, division of the nervous system). Moreover, a study conducted in 1933 revealed that massage can increase blood platelet count [7], while similar research in 2006 showed that red and white blood cell counts increased in cancer patients when combined with other therapies[8]. Other observed effects of massage on the cardiovascular system include increased blood vessel dilation, increased histamine levels (which aid the immune system by enhancing white blood cell function), and increased tissue temperatures. Along with a
number of other studies, the available research strongly indicates that massage affects the cardiovascular system in a positive manner.

It is still unclear whether research regarding massage and the cardiovascular system improves blood circulation. While it may seem obvious that blood circulation would improve throughout the body due to mechanical effects, this has not been clearly demonstrated. What has been demonstrated in one 2004 study is that massage improved blood circulation where localized edema occurred [9]. Challenges to studying the effects of massage on the cardiovascular system lie partly in knowing that the cardiovascular system works on several levels, causing researchers to carefully consider what, exactly, they are measuring, as measurements concerning the cardiovascular system may relate to overall blood flow, arterial vs. capillary blood flow, nutrient exchanges at the tissue level, or even lymph drainage. Research in these areas is on-going.

Summary of the effects of massage on the cardiovascular system:
- Reduces blood pressure.
- Reduces heart rate.
- Increases red blood cell, white blood cell, and platelet counts.
- Increases neurotransmitters in the bloodstream that affect the parasympathetic nervous system.
- Increases histamine levels.
- Increases tissue temperature.
- Local improvement in blood circulation.

Nervous system
As the skin is sometimes thought of as the superficial nervous system, it may appear obvious that massage can have multiple effects on the nervous system given the multiple divisions of the nervous system. Most of the research on massage and its relationship to the nervous system has dealt with the effect of massage on neurotransmitters such as endorphins (which reduce pain), serotonin (which regulates mood, sleep, cognitive functions, appetite, and to a small degree, muscle contractions), and dopamine (which helps control heart rate, blood pressure, and activities of the pituitary gland). Generally speaking, much of the research done on the nervous system’s response to massage has focused on massage’s relaxation and stress-reducing benefits, as well as effects on depression. Studies conducted in 2010 and 2009, respectively, have revealed that massage decreased cortisol (the stress hormone) levels in the bloodstream for women recovering from breast cancer [10] and that shiatsu (an Asian modality of massage) decreased chronic stress in a study of 70 subjects [11].

Research about massage and its positive effects on the nervous system are not limited to just its relaxing effects. Several studies have been investigating the effects of massage on patients with spinal cord injuries and motor neuron function impairment and have found that massage can assist in the recovery of some dysfunctions. Massage has also been shown to reduce motor neuron excitability, resulting in an increased range-of-motion when the cause of such restrictions was due to muscle tension [12]. Massage has also been shown to be an effective therapy for increasing alertness and mathematical skills [13], and relieving depression in adolescents [14]. Massage has even been shown to speed the development of visual function in infants [15].

Summary of the effects of massage on the nervous system:
- Increases neurotransmitter levels associated with the parasympathetic nervous system.
- Decreases cortisol levels.
- Alleviates chronic stress and depression.
- Assists in recovery from spinal cord injuries.
- Decreases motor neuron excitability.
- Increases alertness and cognitive function.
- Advances visual development in infants.

Muscular system
While clients often seek massage to relieve muscular aches and pains, the effects of massage on muscles is not easy to study because particular muscle fibers would have to be dissected. Naturally, it is difficult to find many willing subjects for this type of research. Thus, much of what is thought to be known about the effects of massage on muscles is actually anecdotal (subjective) evidence. It is known from several studies, though, that massage can increase a subject’s range-of-motion, which is an important goal when trying to improve a client’s quality of life. Research conducted in 2001 on 24 adults with chronic lower back pain concluded that massage reduced lower back pain and increased a subject’s range-of-motion through the hips. The results of the research indicated in the abstract stated, “By the end of the study, the massage therapy group, as compared to the [progressive muscle] relaxation group, reported experiencing less pain, depression, anxiety and improved sleep. They also showed improved trunk and pain flexion performance, and their serotonin and dopamine levels were higher [16].” While an increased range-of-motion has been demonstrated, the notion that massage can increase a subject’s overall flexibility has been equivocal. Currently, there is no evidence to support the idea that massage lengthens muscle fibers themselves, as is often recited by massage therapists. However, as indicated in the previous section on the nervous system, massage does decrease motor neuron excitability, which can lead to a tense muscle returning to its original length.

Discussing the effects of massage on the muscular system would not be complete without mentioning myofascial trigger points, nodules within muscle tissue that reduce muscular function and refer pain. Trigger points are a common focus during a massage session, so it is expected some research would be done on them. Studies have concluded that trigger point therapy has been effective in reducing headaches and neck and back pain, as well as increase range-of-motion and restore normal muscular function [17][18]. Although specific protocols for treating trigger points has not been established by these studies, trigger point therapy has been shown to be beneficial nonetheless.

Massage therapists often claim that massage can help relieve or reduce muscle soreness, but research has found nothing conclusive. While one study demonstrated a decrease in delayed-onset soreness (DOMS) and edema, another showed only slight improvement in a subject’s perceived soreness level and range-of-motion restrictions due to muscle soreness, but no change in presentations of edema. There are limitations in measuring soreness levels because soreness may be more of a psychological perception than a measurable mechanical or physiological effect, and edema that occasionally accompanies soreness varies. Research into massage and muscle soreness is on-going.

Finally, it is sometimes asserted that massage serves as a passive exercise and can help tone a client’s muscles without exercise. There is no direct evidence to support this idea, although there may be a connection because massage can delay the muscle atrophy associated with bed rest or paralysis due to its effects on other body systems (such as locally increased blood circulation). It should be noted, that delaying muscle atrophy is not the same as muscle toning – this appears to be a benefit massage does not provide.

Summary of the effects of massage on the muscular system:
- Relieves muscular pain.
- Increases a muscle’s range-of-motion.
- Decreases motor neuron excitability.
- Reduces the effects of myofascial trigger points.
- May slightly relieve muscle soreness and any associated edema.
- May delay muscle atrophy through massage’s effect on the cardiovascular system.
- Does not tone muscles.

Connective tissue
Massage also has effects on dense connective tissue such as tendons, ligaments, and scar tissue, (loose connective tissue, such as blood, is mentioned elsewhere in this course). The most recent research suggests that some connective tissue responds to massage in a similar fashion to muscle tissue; e.g., the transverse friction and cross-fiber friction techniques used in massage can increase a tendon’s range-of-motion.
by reducing excessive amounts of scar tissue [19]. Likewise, massage has been beneficial for burn victims, as deep pressure increases fibroblast (a cell that makes collagen and forms scar tissue) activity, resulting in scar tissue that is stronger and more flexible than it would be without massage [20].

**Endocrine system**

As with the nervous system, the endocrine system controls much of the human body. Thus, it is difficult to discern the effects massage has directly on this system, or whether the effects of massage on this system are caused by its interactions with other systems. However, as previously discussed, massage can influence levels of cortisol, the adrenal hormone related to stress. Moreover, massage has been shown to decrease cortisol levels across multiple populations. Therefore, it may be inferred that massage can effect other hormones of the body, but this research in still in its early stages, as most research on massage and the endocrine system has been restricted to measuring cortisol levels.

Still, one of the endocrine system disorders, type 2 diabetes, is worth mentioning here. As this disease grows to epidemic proportions in the United States, money is being diverted into studying ways to combat the disease and its health consequences. Specifically, research is currently underway to study how massage might influence the levels of insulin (a hormone that helps muscles and fat absorb blood sugar) in the bloodstream. Preliminary reports indicate that massage may help relieve symptoms of type 2 diabetes, though most of the current research focuses on massage and whether it can stimulate insulin production or increase the absorption rate. A study conducted in 2008 showed that massage can help with symptoms, concluding that, “Preterm infants who received massage therapy not only showed greater weight gain but also a greater increase in serum insulin and IGF-1 levels (a protein hormone similar to insulin), suggesting that massage therapy might be prescribed for all growing neonates (a newborn child) [21].”

Summary of the effects of massage on the endocrine system:
- Decreases cortisol levels.
- Influences the production and absorption of insulin.
- May relieve symptoms of type 2 diabetes.
- May influence numerous other hormone levels, thereby affecting multiple systems.

**Lymphatic system and immunity**

As discussed earlier, massage does have beneficial effects on the cardiovascular system and can locally increase blood circulation. Since the flow of lymph in the body is similar to blood circulation (except that it only flows in one direction), it stands to reason that massage may aid the flow of lymph, too. Indeed, there is evidence that massage decreases both localized edema and the edema that results from lymph blockages [22]. Perhaps more importantly, research has shown massage to be beneficial for cancer and HIV-positive patients, as massage helps raise specific lymphocyte (killer T-cells) levels [23]. Furthermore, research conducted on 35 men in 1998 found that massage increased white blood cell counts in men with percutaneous symptoms of prostate cancer [24]. However, although the preliminary research appears promising, it should be noted, that larger, more thorough studies have failed to reach similar conclusions about massage and the immune system, indicating the difficulty in accounting for the numerous variables needed for accurate findings. Nonetheless, massage can reduce the pain, anxiety, and stress of patients suffering from cancer or HIV diagnoses. Lastly, there has been a general concern among physicians and massage therapists that massage may assist in spreading some forms of cancer around the body. Although there is no evidence for this concern, it is worth considering the fact that since massage can assist lymphatic flow, massage is typically withheld from clients with lymphatic cancer who do not present a massage therapist with a physician’s referral. This is simply erring on the side of caution until the proper research can provide the massage profession with guidance in this area of concern. As the number of cancer patients continues to grow and new courses of treatment sought, the massage profession can look forward to the results of this rapidly expanding field of research.

Summary of the effects of massage on the lymphatic system and immunity:
- Assists the flow of lymph throughout the body.
- Decreases localized edema associated with lymph blockages.
- Raises killer T-cell levels in cancer and HIV patients.
- May raise levels of other white blood cells in the bloodstream.
- May reduce the pain, anxiety, and stress associated with cancer and HIV diagnoses.

**Integumentary system**

Does massage have any effect on the skin itself? As stated in this course, massage can increase localized tissue temperature by increasing local circulation (as blood nears the surface of the body, it releases heat). It has also been established that massage can reduce subcutaneous scar tissue, giving researchers reason to suspect massage may help minimize scars resulting from burns if massage is applied within the injury’s acute phase (investigations into this claim are currently underway). Thus, since massage assists nutrient exchange in muscle tissue, it likely assists nutrient exchange in skin tissue as well. Massage has been shown to improve conditions such as eczema, dry or rough skin, and itching in children on the most superficial layer of skin, the epidermis [25]. Also, a 2005 systematic review of the literature found that certain massage techniques (effleurage, in particular) are routinely used to prevent skin ulcers in bedridden patients. As indicated in the study’s abstract, “A careful review of this information; the clinical, physical, and pathophysiological aspects of pressure ulcers, including extrinsic and intrinsic factor; and the time-pressure relationship suggests that one type of massage may be beneficial for persons who are at risk for developing pressure ulcers [26].” The study noted that the benefits of massage were not always observed, citing differences in the skin conditions of patients of varying pathologies. Still, the often cited benefits of massage and its effectiveness for decreasing anxiety and stress have been shown to improve skin conditions resulting from stress [27].

Summary of the effects of massage on the integumentary system:
- Increases skin temperature.
- May increase nutrient exchange through increased local circulation.
- May minimize scars that result from burns.
- Can alleviate conditions such as eczema, dry or rough skin, and itching in children.
- Prevents skin ulcers in bedridden patients.
- Improves skin conditions that are the result of stress.

**Psychological benefits**

While scientific research into the effects of massage on the human body may still be new, studies involving the effects of massage on human psychology are even newer. The psychological effects of massage are difficult to study as data are often subjective, such as asking subjects how massage makes them feel. It is also difficult to discern the effects massage has on human psychology that are not the result of the physical interaction between therapist and subject or are the result of any placebo effect. These problems are quite different from measuring neurotransmitter or hormone levels in the blood or taking temperature readings. Despite the challenge, research in 2008 on massage and attention deficit hyperactivity disorder (ADHD) revealed that massage improved attention, concentration, and overall cognitive function in adolescents diagnosed with the disorder [28]. Others studies, such as one conducted in 2007, showed that massage is beneficial for victims of physical and sexual abuse, particularly in children and adolescents. The lead researcher, Tiffany Field, writes in her abstract, “Massage therapy has been effective with violent adolescents, perhaps because the physical stimulation reduced their dopamine levels and increased their serotonin levels. Their aggressive behavior decreased and their
empathetic behavior increased” but that “These preliminary data need to be replicated in a larger sample with a more comprehensive set of measures [29].” Numerous studies also suggest that massage may improve body image in women, assist clients in processing emotional issues, and help manage other psychiatric disorders, although research in this area is not yet conclusive. With a mind-body connection often assumed, more research needs to be conducted to discover which benefits of massage are from massage itself and not from the client’s expectation. It must be made clear that the therapist may not use massage to treat clients’ psychological disorders, as treating such disorders are outside the scope of practice for massage therapists.

Effects of massage for specific pathologies and disorders

Breast cancer
As indicated in the section on the lymphatic system and immunity, massage can help boost the immune system and reduce anxiety and stress associated with cancer diagnoses. A study at the University of Minnesota in 2003 further concluded that light touch by either a massage therapist or other health care provider reduced the need for pain medications for breast cancer patients, while another 2003 study of 58 women in Miami found that massage reduced symptoms of depression in women with breast cancer, while increasing dopamine levels (the hormone associated with a general sense of well-being). The same study also confirmed that massage increased killer T-cell presence in the bloodstream.

Carpal tunnel syndrome (CTS)
This dysfunction that can cause severe pain and/or numbness of the thumb, index finger, and middle finger, is common among office workers. It is sometimes idiopathic but may be caused by pressure on the median nerve, possibly due to the inflammation that arises in response to local wrist injury, repetitive wrist actions, or a decrease in synovial fluid (the fluid that lubricates joints) among the carpal bones. A well-designed, double-blind 2008 study of 27 subjects concluded that massage provided a substantial increase in wrist strength by the fourth week of twice weekly massages. However, improved grip strength was the only benefit observed in this case [30]. Still, when considering the known effects of massage on various body systems, it is reasonable to conclude that massage can assist CTS sufferers in managing their pain, as well as reduce the localized edema that occurs with this disorder.

Migraines
According to the Migraine Research Foundation, this particular presentation of headaches characterized by extreme sensitivity to light, sound, touch, and smell, as well as nausea, vomiting, dizzy spells, and tingling or numbness in the face or limbs is one of the top 20 most disabling disorders in the world. Besides a migraine’s debilitating effect, even the anxiety associated with anticipating a migraine attack can interfere or interrupt a client’s daily routine, ultimately leading to a loss of $11 billion dollars to U.S. companies alone. While the cause of migraines is not entirely understood, there are indications that genetics and environmental factors are involved, which may contribute to lower serotonin (a neurotransmitter) levels in the bloodstream. In addition, hormonal changes are another cause of migraines in women (particularly when estrogen levels drop during menstruation), while intense exercise and disruptions in sleep cycle are also cited as causes of migraines. These are not the only migraine triggers, but are the ones that massage may help to prevent or overcome because massage can affect neurotransmitters, thereby influencing the calming and pain-killing aspects of the parasympathetic nervous system. A 2007 study on 47 subjects found that, “Compared to control participants, massage participants exhibited greater improvements in migraine frequency and sleep quality during the intervention weeks and the 3 follow-up weeks. Trends for beneficial effects of massage therapy on perceived stress and coping efficacy were observed. During sessions, massage induced decreases in state anxiety, heart rate, and cortisol [31].” Moreover, these were the effects massage had on migraine sufferers with no complementary therapy, such as prescription drugs.

Multiple sclerosis (MS)
This disease is a progressive degeneration disease of the nervous system that slows or may block motor neuron transmission, resulting in muscle weakness and problems with coordination and balance. Although the cause of this disease is idiopathic, a study conducted in 2013 found that, “Massage therapy resulted in significantly larger improvement in pain reduction (mean change 2.75 points, P = 0.001), dynamic balance (mean change, 3.69 seconds, P = 0.009) and walking speed (mean change, 7.84 seconds, P = 0.007) than exercise therapy. Patients involved in the combined massage-exercise therapy showed significantly larger improvement in pain reduction than those in the exercise therapy (mean change, 1.67 points, P = 0.001),” thereby concluding that, “Massage therapy could be more effective than exercise therapy. Moreover, the combination of massage and exercise therapy may be a little more effective than exercise therapy alone [32].” Considering the study’s conclusion, it is again important to note that, when working with an MS client, therapy should be restricted to massage alone and not exercise therapy as such treatment is not in a massage therapist’s scope of practice. Also, massage should not be used as a treatment protocol for the visual and cognitive disturbances associated with MS unless under the direct supervision of a physician.

Asthma
Asthma is a respiratory system disease that causes the airways to become inflamed and more narrow, resulting in difficulty breathing, shortness of breath, coughing, and occasionally, chest pains. Since asthma usually begins in childhood, most research into massage and asthma has been conducted on children. Tiffany Field, of the Touch Research Institute in Miami, conducted a 2008 study of 32 children with asthma and concluded that children who received massage for 20 minutes for a month showed improved pulmonary function, less difficulty breathing, and less anxiety (lower cortisol levels), leading to fewer asthma attacks. The study qualified its findings by noting that the massage treatments were more effective in children 4 to 8 years old than in the group of older children 9 to 16 years old, and that this discrepancy was omitted. However, follow-up research conducted in 2011 at the Department of Pediatrics in Cairo, Egypt, found that among 60 children with asthma, those who received 20 minutes of massage every night before bed for 5 weeks showed marked improvements in normal breathing flow compared with those who received standard asthma treatments such as inhaler medicine and breathing and relaxation exercises.

Fibromyalgia
A disorder of the central nervous system (CNS) for which there is no known cause, fibromyalgia is characterized by widespread superficial pain, superficial numbness and tingling, joint stiffness, cognitive dysfunction, chronic fatigue, and difficulty sleeping. A 2011 study concluded that among 74 fibromyalgia patients split into two groups – one receiving massage in the form of myofascial release and the other receiving sham (fake) treatments – “Pain, anxiety, quality of
sleep, depression, and quality of life were determined at baseline, after the last treatment session, and at 1 month and 6 months. Immediately after treatment and at 1 month, anxiety levels, quality of sleep, pain, and quality of life were improved in the experimental group over the placebo group. However, at 6 months post-intervention, there were only significant differences in the quality of sleep index. Myofascial release techniques improved pain and quality of life in patients with fibromyalgia [32].” In 2010, a review of existing research into massage for fibromyalgia patients found only moderate benefits for those with the disorder and suggested that fine-tuning the methodology of the reviewed research would perhaps reveal definitive answers, which is what the 2011 study attempted to do by restricting its methodology to the use of the myofascial release technique.

**Chronic fatigue syndrome (CFS)**

Although CFS is a symptom of fibromyalgia, it is also a symptom of many other conditions and diseases, and may be an idiopathic disorder unto itself. Another study by Tiffany Field and her team in 2012 revealed that among a group of 20 subjects, those placed into the massage portion of the study not only showed improvements in their self-reported anxiety and depression levels immediately following their first massage, but continued to show improvements over the course of 5 weeks compared with those not receiving massage [33]. Other studies involving massage and CFS have not focused solely upon massage’s role in helping relieve CFS symptoms, but instead chose to include massage among other complementary medicines to see how such practices may help. This leaves the previously mentioned study as the best evidence for the effects of massage on CFS clients. As stated earlier in the course, good research needs clearly defined experimental protocols to reach definitive conclusions. Therefore, research could be conducted on the use of certain stimulating massage techniques such as the percussive movements of tapotement to see how it may benefit CFS clients.

**Alzheimer’s disease (AD)**

Alzheimer’s disease (AD) is a type of incurable dementia, a category of brain disorders whose symptoms include loss of cognitive function. For AD sufferers, specific symptoms include memory loss, confusion about otherwise routine tasks, speech impediments, and aggressiveness or paranoia in the disease’s later stages. While massage cannot or does not appear to be able to slow the progression of the disease, research has shown some promise in managing the aggressiveness seen in late-stage AD patients. A 1999 study concluded that, “Verbal displays of agitation, the most frequently cited form of agitation in community-dwelling individuals with AD, were not diffused by slow-stroke massage. However, the more physical expressions of agitation such as pacing, wandering, and resisting were decreased when slow-stroke massage was applied [34].” Although it is possible these results are because of the psychological benefits of massage, they may also be due to the known effects of massage on the parasympathetic system. Research into this particular field of study has been underway for two decades, but the limitations of small subject pools are hindering definitive answers.

As research continues to show at least some benefits of massage for many disorders, further research will be conducted to establish specific protocols to help the therapist decide which massage techniques are most effective for any given condition. This will help elevate the profession of massage therapy to its proper place alongside other health care professions.

**How to get involved with massage therapy research**

According to the Massage Therapy Foundation, the easiest way to assist massage therapy research is to donate to the foundation to help fund studies. Another way is for the therapist to sponsor seminars on the benefits of massage for a special population, such as cancer patients. Other ways include volunteering as a fundraiser or a grant writer, or work in public relations, communicating the necessity of massage therapy research. A possible hands-on approach is to search contract opportunities for research provided by the National Institutes of Health on the Grants and Funding page of their website (http://grants.nih.gov/grants/oer.html). Another hands-on approach is to become involved in massage therapy research by writing case studies about clients — a case study is a description of a particular client with a specific condition treated in a clinical setting. These scientifically written studies that are typically submitted to massage journals, such as The International Journal of Therapeutic Massage and Bodywork (IJTMB), may provide researchers with more motivation to investigate the benefits of massage. Although it is beyond the scope of this course to detail how case studies are written, there is a great deal of guidance on the Internet or at a local college. However, if performing and writing a case study is too complicated or involved, it may be helpful to contact a local university science department, or search www.clinicaltrial.gov to see what, if any, research on massage is underway and if so, how to contribute. Professional massage organizations, such as the Associated Bodywork and Massage Professionals (ABMP), are another place to inquire about getting involved in massage research. You should strongly consider getting involved in research — it is a great way to elevate your status as a health and wellness provider by helping to demonstrate the scientifically proven benefits of massage therapy to the world.

**References**


### MARKETING RESEARCH FOR THE MASSAGE THERAPIST

**Final Examination Questions**

Select the best answer for each question and mark your answers online at [Massage.EliteCME.com](http://Massage.EliteCME.com).

1. What method is used to discover new facts about a new or existing question?
   a. The qualitative method.
   b. The quantitative method.
   c. The scientific method.
   d. The experimental method.

2. Which of the following would be considered a clinically significant finding?
   a. Results that were greater than 50%.
   b. Results that were greater than 75%.
   c. Endorphin levels rising to such a degree that pain was reduced to a point that improved a subject’s quality of life.
   d. Endorphin levels rising only slightly and did not improve a subject’s quality of life.

3. What are independent variables?
   a. Those things that can be controlled in an experiment.
   b. Those things that cannot be controlled in an experiment.
   c. The measurements taken during an experiment.
   d. Numbers.

4. What are confounding variables?
   a. Those things that can be controlled in an experiment.
   b. Those things that cannot be controlled in an experiment.
   c. The measurements taken during an experiment.
   d. Numbers.

5. It is estimated that as many as ____% of all changes in a subject group during clinical drug trials are the result of the placebo effect.
   a. 5.
   b. 10.
   c. 15.
   d. 20.

6. What are the three broad categories of the effects of massage?
   a. Chemical, mechanical, and psychological.
   b. Mechanical, physiological, and psychological.
   c. Chemical, cellular, and tissue.
   d. Organ, organ system, and organism.

7. Which is *not* listed as an effect of massage on the endocrine system?
   a. Decreases cortisol levels.
   b. Influences the production and absorption of insulin.
   c. May increase tissue temperature.
   d. May influence numerous other hormone levels, thereby affecting multiple systems.

8. In a study of cancer and HIV patients’ immunity systems, which white blood cells were elevated due to massage?
   a. Killer B-cells.
   b. Killer C-cells.
   c. Killer E-cells.
   d. Killer T-cells.

9. Which of the following is not an effect of massage on the integumentary system?
   a. Increases skin temperature.
   b. Eliminates scar tissue.
   c. Prevents skin ulcers in bed-ridden patients.
   d. Improves skin conditions that are the result of stress.

10. According to the text, which of the following in a possible hands-on approach to getting involved with massage therapy research?
    a. Writing case studies about clients.
    b. Donating money to the Massage Therapy Foundation.
    c. Working in public relations.
    d. Sponsor seminars on the benefits of massage for special populations.

Additional resources