Palliative Medicine & Care International Journal
ISSN: 2688-3821

Juniper Publishers
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Mini Review
Volume 3 Issue 5 - November 2020
DOI: 10.19080/PMCIJ.2020.03.555624

Palliat Med Care Int J

Brain and Touch Therapy: Research on Massage Therapy, Fitness, Rehabilitation - Case Report for a Randomized Controlled Trial

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Submission: October 05, 2020; **Published:** October 12, 2020

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Abstract

The massage or touch is to give well-being through touch, body. A well-being not only physical, but also neural, social, rewriting neuronal circuits and improving synaptic plasticity. With this image I want to highlight the art of massage, manual techniques, rehabilitation and also movement and psychology. In a moment of uncertainty I want to give certainties; what we will return to instill well-being again. this is the topic of our research. indeed two. we scientifically demonstrate how both the massage and the Lagree method are fundamental for a better cognitive development, so please send me the material in private. If you want you can; you are a thinking being and while you think, think big. Imagine, create, thrill and expand. Reinvent yourself by creating the best version of yourself. Now imagine and create the desired reality. The amygdala, an almond-shaped group of nuclei located in the limbic system, deep within the medial temporal lobes of the brain, is the boss when it comes to processing and storing memories of various emotions. In fact, the amygdala experiences emotions even before the conscious brain does. Repetitive triggering of the stress response makes the amygdala more reactive to apparent threats, which stimulates the stress response, thereby further triggering the amygdala, on and on and on in a vicious cycle. The amygdala serves to help form "implicit memories," traces of past experiences that lie beneath conscious recognition. As the amygdala becomes more sensitized, it increasingly tinges those implicit memoirs with heightened residues of fear, causing the brain to experience ongoing anxiety that no longer has anything to do with the circumstances at hand. At the same time, the hippocampus, which is critical for developing "explicit memories" -clear, conscious, records of what really happened- gets worn down by the body's stress response. Cortisol and other glucocorticoids weaken synapses in the brain and inhibit formation of new ones. When the hippocampus is weakened, it's much harder to produce new neurons and thus make new memories. As a result, the painful, fearful experiences the sensitized amygdala records get programmed into implicit memory, while the weakened hippocampus fails to record new explicit memories. When this happens, you wind up with no real memory of what set you off to begin with but with a very clear sense that something bad-something very bad-is happening. We have to transcend the body to change the body, overcome the ego to change the ego. We must become pure awareness and going beyond time, forget the known reality and go into the unknown and observe the infinite possibilities and tune into the possible realities, because if we think about them, in the quantum universe they already exist.

Keywords: Neuroscience; Deep skills; Recognition memory; Spatial memory; Physical activity; Psychomotor skills; Lagreefitness; Mental health; Rehabilitatio; Cognitive exercise; Massage; Exercise physiology; Neurophysiology; Psychology; Psychophysiology

Abbreviatations: FMRI: Functional Magnetic Resonance Imaging; EEG: Encephalograms; GDV: Gas Release Visualization Machine; BOLD: Blood Oxygen Level-Dependent Signal;

Introduction

we are doing research on the benefits of massage. Through science with functional magnetic resonance imaging (fMRI) brain maps with encephalograms (EEG) and tests on individual energy fields with a gas release visualization machine (GDV). Through the touch on we rewrite the neuronal circuits through neurochemistry and neuroplasticity. Insula, posterior and anterior cingulate, inferior parietal cortex and medial prefrontal are involved in the neural correlates of consciousness, particularly in arousal and awareness. The massage activates the anterior cingulate cortex and the subgenual retrosplenial / posterior cortex. This increase in blood oxygen level-dependent signal (BOLD). Through the touch some mechanoreceptors are stimulated including: Merkel cells, Ruffini finals, Pacinian corpuscles, Meissner corpuscles, Free nerve termination. There is already research where the effects of body massage in premature infants have been explored and massage has been found to accelerate the maturation of electroencephalographic activity and visual function, particularly

visual acuity. Higher levels of IGF-1 in the blood were found in massaged infants. The massage accelerated the maturation of visual function even in rat pups and increased the level of IGF-1 in the cortex. The antagonizing action of IGF-1 by systemic injections of the IGF-1 antagonist JB1 blocked the effects of massage in pups. These results show that massage has an influence on brain development and in particular on visual development and suggest that its effects are mediated by specific endogenous factors such as IGF-1. The connection between touch and feelings of emotion seem to occur in the limbic brain. In short, massage, in addition to the various bodily benefits, also has positive effects on the mind, helping in the treatment of anxiety or depression disorders or even diseases of the nervous system. You may have always known this but now science declares it more and more [1,2].

Exercise encourages the brain to function at its optimal level of capacity, thus favoring the multiplication of neurons and the strengthening of neural connections, with the "side effect" of amplifying intellectual abilities. Motor coordination occupies a relevant part of what we mean "quality" of movement and is the basis of the integrated training method that we want to propose [3,4].

The classic traditionalist view holds that a movement is coordinated when the content of the central impulse that commands the efferent impulses towards the periphery performs movements identical to the copy of this central impulse, the cortical one. The new concept of coordination maintains that it is not enough for the brain to send an impulse to ensure that the body moves accordingly but it is necessary, in addition to the efferent system where the last motor neuron is too influential, a series of auxiliary systems that make this impulse controlled and constant. The result of this controllability is included in the environment surrounding the action. Research on expertise (competence) discusses this assumption and shows that performance can be greatly influenced by voluntary intensive training. Evidence on the plasticity of the human mind and body suggests that the acquisition of skills should rather be described as a process of specific adaptations to the typical activities of the domain rather than as a development of the pre-existing innate ability muscles "don't move" without brain. The amygdala, an almond-shaped group of nuclei located in the limbic system, deep within the medial temporal lobes of the brain, is the boss when it comes to processing and storing memories of various emotions. In fact, the amygdala experiences emotions even before the conscious brain does. Repetitive triggering of the stress response makes the amygdala more reactive to apparent threats, which stimulates the stress response, thereby further triggering the amygdala, on and on and on in a vicious cycle. The amygdala serves to help form "implicit memories," traces of past experiences that lie beneath conscious recognition. As the amygdala becomes more sensitized, it increasingly tinges those implicit memoirs with heightened residues of fear, causing the brain to experience ongoing anxiety that no longer has anything to do with the circumstances at hand [5,6].

At the same time, the hippocampus, which is critical for developing "explicit memories" -clear, conscious, records of what really happened-gets worn down by the body's stress response. Cortisol and other glucocorticoids weaken synapses in the brain and inhibit formation of new ones. When the hippocampus is weakened, it's much harder to produce new neurons and thus make new memories. As a result, the painful, fearful experiences the sensitized amygdala records get programmed into implicit memory, while the weakened hippocampus fails to record new explicit memories. The Lagree Fitness Method using the Megaformer, because of its innovative design is optimally suited to rehabilitation type exercise. While known primarily for its use in the fitness industry, the Megaformer has several mechanical features, which make it suitable for use in rehabilitation. It is a very solid and stable platform. Even morbidly obese patients will be able to use the machine safely. The patient can be sitting, lying down supine, prone, or standing, which is helpful for disabled patients [7,8].

With over 300 defined exercises, and countless user described modifications there is a very large selection of ways to train each muscle group. Their springs provide many different resistances, so adjusting the resistance to even severely weak patients feasible, as in this case. In addition, counter intuitively, exercises done on the front of the machine, get easier as resistance is added. Rehabilitation of deconditioned muscles is a difficult and complex process. In many cases neurological and psychological dysfunction is ongoing. Lagree Fitness training with the Megaformer can be a valuable tool in this patient population. Disabled patients can improve muscular strength, endurance, coordination, and balance using a modified version of LF training. For appropriate patients in a well monitored and controlled environment, LF training can be used to reverse the debilitating effects of many neurologic disorders. Medical clearance should always be sought before starting any rehabilitation program [9,10].

Learning and Memory

Memory is a wonderful mechanism, a means of transporting us back in time. We can go back a moment, or a large part of life. Sometimes not perfect, sometimes not authentic, sometimes with nuanced details, memory is still the system that allows us to recall the information we have stored and learned from both the external and internal environment. It is the experience that changes us, the contact with the environment that modifies our behavior through a series of both structural and functional changes of our nervous system. The last challenge of neuroscience is precisely to better understand the complexity of these mechanisms and how complex phenomena such as learning and memory can occur [11].

Although the changes that occur within individual brain cells can be relatively simple, given that the brain is made up of many

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billions of neurons, the overall phenomenon is certainly very complex and makes the isolation and identification of the specific changes responsible. of a certain really difficult memory. Similarly, although the elements of a specific learning task may be simple, its implications for the organism can be very complex (Carlson, 2002).

From a neurobiological point of view, learning and memory are adaptations to the environment of the brain circuits that allow us to respond appropriately to situations we have previously experienced. Therefore, learning (process through which the nervous system acquires new information and experiences) and memory (the ability to retain, preserve and recall such information) are the main mechanisms through which environmental events shape behavior. Experiences are not simply "accumulated" in the brain, but are able to cause plastic changes in our nervous system and to alter the circuits involved in our more sophisticated functions; in this way they change our way of acting, thinking, perceiving, planning. Memory and synaptic plasticity are thoroughly studied by neuroscientists who can now rely on the use of different methodologies and technologies ranging from behavioral studies to the investigation of gene expression. Thus, understanding the changes in synaptic efficacy represents the most well-known field of investigation to date, even if memory is not just a succession of synaptic events. In a more holistic view of the process, memory is determined by the integration of multiple signals and activities that affect the brain (attention, intention, interest, emotionality), but also that which involves the emotional state of the subject (hormonal structure, physical stress , etc.) [12].

Recent data, obtained thanks to the development of morphometric techniques, underline how experience is also able to cause changes in the morphology of the neuron and in particular of the synapse. Three significant examples of morpho-functional alterations reported here have been chosen. A first example constituted by the demonstration that an environment rich in visual, auditory, tactile stimuli, etc., induces in the rat, modifications at the level of the visual cortex which can be quantified as an increase in: a) weight and thickness of the cortex; b) size of the cell bodies of neurons; c) length and number of dendrites; d) diameter of synapses and dendritic spines; e) number of synaptic contacts of cortical neurons. These modifications can be induced in both young and middle-aged or old animals, suggesting that neuronal plasticity, very pronounced in developmental age, is maintained throughout life (Turner and Greenhough, 1985).

A second example is represented by the modifications of the CA1 area of the hippocampus, both in the number of neurons between synapses and dendrites and in the shape of the dendritic spines after induction of long-term synaptic enhancement (LTP) (Chang and Greenhough, 1984). The third example of morpho-functional alteration is provided by the increase and decrease of pre-synaptic markers in neurons (Bailey and Chen, 1983). These various experimental observations clearly indicate how the memorization processes are also related to morphological modifications at the synaptic level as anticipated by the intuitions of Hebb (1949) who proposed that if two neurons are active at the same time, the efficiency of the synapse is strengthened.

Anatomical Structures

Learning and memory are not functions confined to a single brain area or a limited number of cells, but in different brain areas as already demonstrated by studies on rats with brain lesions carried out by the American psychologist Karl Lashley, in the first half of the 20th century, and by the his pupil, Donald Hebb (1949). The latter's hypotheses stimulated the development of computer models of neural networks; his assumptions have contributed to the study of memory, demonstrating that this information is not stored in the hippocampal structures and in the connected diencephalic structures and that the cerebral cortex may be the main long-term storage site of different aspects of memory.

Since different cortical areas preside over different cognitive functions, it is not surprising that information related to the specific cognitive function of the corresponding cortical area is stored in these regions.

Frontal cortex

The frontal cortex is part of the neocortex, which covers most of the surface of the cerebral hemispheres and is so called because it developed in a recent evolutionary period. It is divided into the prefrontal cortex and the motor cortex, which in turn is divided into the premotor cortex, the supplementary motor area and the primary motor cortex. In addition to involvement in some aspects of memory, the frontal cortex also performs executive functions that affect the organization of behavior.

Medial temporal lobe

The temporal lobe is important for recording past events and contains two important areas in the processes of declarative memory, the hippocampus and the amygdala, located in the medial part of the temporal lobe.

Hippocampus

Although different areas of the brain play a role in the consolidation of different forms of learning and memory, the hippocampus has been recognized as having a vital role in particular in the formation of declarative memory, such as semantic and episodic memory. In 1957, Scolville and Milner observed that bilateral removal of the hippocampus, as a treatment for epilepsy in the patient H.M., caused anterograde amnesia. Since then, several studies have been conducted and the specific role of the hippocampus and temporal lobes in the formation of memory was explicitly identified.

Amygdala

The amygdala plays a decisive role in physiological and behavioral reactions towards stimuli or situations with a biological significance, such as those related to pain or the presence of food;

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therefore emotionally relevant. Neurons in the central nucleus of the amygdala project to the brain regions that oversee the expression of the different components of emotional responses; in particular in emotional learning linked to aversive situations. So the amygdala is a brain structure essential for the acquisition and expression of conditioned fear. In this regard, several behavioral studies have been carried out with Fear Conditioning. As already mentioned, the latter is a test which consists in applying a short electric shock immediately after an acoustic stimulus. The electric shock will elicit an unconditional emotional fear response with altered heart rate and blood pressure. After a short period of training, just hearing the sound, the rats show the same kind of physiological responses evoked by the electric shock; they also exhibit a behavior defined as freezing, i.e. a species-specific defensive response consisting in an arrest of the behavior.

Anxiety and Manual Techniques

Anxiety is an inevitable part of life. There are several components of anxiety that can cause problems in everyday life. The worry related to the thought that our actions can always lead to negative consequences, fear, and the loss of mental alertness. Other anxiety disorders include specific phobias, obsessive compulsive disorder, post-traumatic stress disorder, panic.

Anxiety manifests itself as trait anxiety, which is recognized by physical and / or psychological symptoms, or as state anxiety, which has a temporary nature, usually associated with specific stimuli that act as activators.Anxiety is a complex phenomenon but from the clinical description it can be defined as a psychosocial condition with associated worry and fear, mixed with physical symptoms. Mental anxiety produces muscle tension that can be reduced using therapeutic massage, which sends signals to the brain by relaxing the muscles. It can thus increase the overall relaxation and available energy, making it easier to deal with different situations. The main objective of the therapeutic massage is the reduction of stress and relaxation, with psychological effects that include mental relaxation, the reduction of depressive states, anger and fear; making the recipient feel that someone is taking care of him / her.Therapeutic massage is one of the most popular and widespread complementary therapies in the world. The need for contact is one of the basic needs of the human being and massage, as a form of contact, produces a relaxation of the body and mind. An important aspect of therapeutic massage is non-verbal communication, inducing a form of respect, trust, empathy without the use of words, and only through physical contact. Anyone can enjoy therapeutic massage, both as a treatment method and as a daily habit.Nowadays, more and more people use massage to decrease pain and stress, and to achieve a general feeling of well-being. Several clinical studies show that massage therapy can have positive effects on anxiety, pain and muscle tension.A moderate pressure massage contributes to many positive effects: reduction of pain in various syndromes, including fibromyalgia and rheumatoid arthritis, improves attention levels, reduces symptoms of depression and strengthens the functions of the immune system.From a comparative study between massage with light and moderate pressure in the laboratory, it was found that massage with moderate pressure reduces depression, anxiety and heart rate, and alters EEG patterns, as occurs in a relaxation response. It also leads to an increase in vagal activity and a reduction in cortisol levels, associated with chronic stress. The functional magnetic resonance data show that this massage is represented in different regions of the brain, including the amygdala, the hypothalamus and the anterior cingulate cortex, all areas involved in the regulation of emotions and stress.The massage is used for maintaining health and for the prevention of ailments, to restore the body to a general energy balance, covering the physical and social aspects, and the psychological aspects of the patient.

Scientific Protocols

We can simplify the functioning of our brain as dependent on two closely related and complementary parts, acting and deciding separately. The most external (cortex) is the rational one, in which we record all our "knowledge" in the most notional and encyclopedic sense of the term: we could consider this cortex as the conscious part of us, the one regulated by the will. However, there is an internal part of our brain (subcortical or limbic) made up of different systems connected to each other (a skein of ganglia and neurons) that act on our hormonal (endocrine) system and regulate instinctive, affective and vegetative functions. We could consider the limbic system as our instinctive part.

The movements used as a treatment in the Amazonian Massage® and the manual skills aimed at forming waves that propagate inside the person's body, act on the human brain at the subcortical level. The human body's response to the solicitations of the Amazonian Massage® is therefore produced at the subcortical level and cannot be controlled. That is, there is evidence that the movements practiced in the modalities of our massage result in automatic responses of the brain.

How does this happen?

Signals from the sense organs (skin for touch, eyes for sight, ears for the vestibular system of balance, proprioceptive muscle-tendon systems) travel first to the thalamus and then immediately to the amygdala.

There is a very thin bundle of nerve fibers that go from the thalamus to the amygdala, so the response to stimuli begins in the amygdala before the neocortex.

Where is the amygdala located? Below the cortex, it is part of the limbic system, above the brain stem. It is a core of gray matter. It is considered a center of integration of emotions. It is also involved in emotional memory systems. It begins to respond to stimuli before the neocortex. When a particular movement is perceived as in the case of our Amazonian Massage® practiced

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with rocking and oscillations that have a given frequency, the amygdala immediately sends an automatic, subcortical, uncontrollable response of well-being.

The effect

The amygdala is a subcortical mechanism that is activated by any basic mechanism. Emotions (anger, fear, happiness, surprise, relaxation) are not controlled, they are not mediated by the cerebral cortex, which is an evolved zone. As we grow up, as we "get older" we learn to control emotions, because the reactions mediated by the cortex that are acquired over the years, with the experiences tested, which have determined a cortical specialization, intervene.

The stimulated amygdala stimulates the release of endorphins and more or less amount of adrenaline (it depends on whether the stimulus is more or less exciting, and this changes from person to person but also from how the operator performs the maneuvers),

obtaining:

a) relaxation of intestinal spasticity

b) muscle relaxation

c) activation of the cardiovascular system

d) activation of the lymphatic system

e) improved mood

f) improved ability to cope with life

g) deep relaxation

with the following benefits:

a) alteration of muscle tone due to stress

b) insomnia

c) reduction of anxiety neurosis

d) spasticity of the intestinal musculature

e) psychosomatic disorders

f) aesthetic improvements due to lymphatic drainage

g) improvement of the aesthetic vision of oneself

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