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**AN INVESTIGATION ON IMPACT OF YOGA
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An Investigation on Impact of Yoga Interventions on Components of Mental and Physical Fitness: A Short Reviews

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Abstract – In the last years, a new view on mental healthcare has been formed on mental healthcare, called positive psychology. This new view states, that mental health is not solely comprised of a reduction of negative symptoms, such as stress or depression, but positive experiences as well, such as emotional well-being, happiness and self-realization. Yoga, among other activities, is in line with this new view, in the sense that it practices key aspects of positive psychology. More and more research has been conducted on the effects of yoga on mental health in the last years, but little have physical, chronic conditions been the focus of this research.

This report summarizes the current evidence on the effects of yoga interventions on various components of mental and physical health, by focussing on the evidence described in review articles. Collectively, these reviews suggest a number of areas where yoga may well be beneficial, but more research is required for virtually all of them to firmly establish such benefits. The heterogeneity among interventions and conditions studied has hampered the use of meta-analysis as an appropriate tool for summarizing the current literature. Nevertheless, there are some meta-analyses which indicate beneficial effects of yoga interventions, and there are several randomized clinical trials (RCT's) of relatively high quality indicating beneficial effects of yoga for pain-associated disability and mental health. Yoga may well be effective as a supportive adjunct to mitigate some medical conditions, but not yet a proven stand-alone, curative treatment. Larger-scale and more rigorous research with higher methodological quality and adequate control interventions is highly encouraged because yoga may have potential to be implemented as a beneficial supportive/adjunct treatment that is relatively cost-effective, may be practiced at least in part as a self-care behavioral treatment, provides a life-long behavioral skill, enhances self-efficacy and self-confidence and is often associated with additional positive side effects.

INTRODUCTION:-

Yoga is the oldest system of personal development encompassing body, mind, and spirit. The word yoga is derived from the Sanskrit root *Yuj*, which means to join or to yoke. In philosophical terms, yoga refers to the union of the individual self with the universal self. Yoga is an ancient Indian practice, first described in Vedic scriptures around 2500 B.C., which utilizes mental and physical exercises to attain *samadhi*, or the union of the individual self with the infinite. Hatha Yoga has become increasingly popular in western countries as a method for coping with stress and as a means of exercise and fitness training. Hatha yoga is an ancient practice that was developed to promote physical health as well as an awareness of one's true nature. It consists of a series of postures, called *asanas*, and various breathing exercises, called *pranayama*, which encourage balance between the physical, mental/emotional, and spiritual aspects of a human being. In short, hatha yoga promotes health.

Like other forms of yoga, hatha yoga is purported to quiet the mind and focus the concentration; however, of all the yoga traditions, the importance of physical fitness is emphasized most in hatha yoga. Yoga has been practiced for thousands of years. It is based on ancient theories, observations and principles of the mind-body connections. Substantial research has been conducted to look at the health benefits of yoga – yoga postures (*asanas*), yoga breathing (*pranayama*) and meditation. These yoga practices might be interacting with various somatic and neuro-endocrine mechanisms bringing about therapeutic effects (Malhotra and Singh ;2002). Yoga is traditionally believed to have beneficial effects on physical and emotional health. The overall performance is known to be improved by practicing yoga techniques (Upadhyay et al ;2008) and their effects on physical functions were reported (Hadi 2007). Yoga practices can also be used as psychophysiological stimuli to increase the secretion of melatonin which, in turn, might be responsible for

perceived well-being. Yoga may be as effective as or better than exercise at improving a variety of health-related outcome measures (Ross and Thomas; 2010) and as a result this study was undertaken to find out the the effects hatha yoga traning on health related physical fitness variables.

The conceptual background of yoga has its origins in ancient Indian philosophy. There are numerous modern schools or types of yoga (i.e., Iyengar, Viniyoga, Sivananda, etc.), each having its own distinct emphasis regarding the relative content of physical postures and exercises (*asanas*), breathing techniques (*pranayama*), deep relaxation, and meditation practices that cultivate awareness and ultimately more profound states of consciousness. The application of yoga as a therapeutic intervention, which began early in the twentieth century, takes advantage of the various psychophysiological benefits of the component practices. The physical exercises (*asanas*) may increase patient's physical flexibility, coordination, and strength, while the breathing practices and meditation may calm and focus the mind to develop greater awareness and diminish anxiety, and thus result in higher quality of life. Other beneficial effects might involve a reduction of distress, blood pressure, and improvements in resilience, mood, and metabolic regulation.

Khalsa stated that a majority of the research on yoga as a therapeutic intervention was conducted in India and a significant fraction of these were published in Indian journals, some of which are difficult to acquire for Western clinicians and researchers. In their bibliometric analysis from 2004, they found that 48% of the enrolled studies were uncontrolled, while 40% were randomized clinical trials (RCT), and 12% non-RCT (N-RCT). Main categories which were addressed were psychiatric, cardiovascular, and respiratory disorders.

Despite a growing body of clinical research studies and some systematic reviews on the therapeutic effects of yoga, there is still a lack of solid evidence regarding its clinical relevance for many symptoms and medical conditions. For many specific indications and conditions, there is inconsistent evidence with several studies reporting positive effects of the yoga interventions, but other studies are less conclusive. In some instances, these discrepancies may result from differences between the study populations (e.g., age, gender, and health status), the details of the yoga interventions, and follow-up rates.

In addition to yoga research being conducted on adults, there is increasing interest in the benefits of yoga on a more complete span of individuals - including school age children, adolescents, expectant mothers, and the elderly. Yoga research is quickly being extended to other populations as well, including people in the workplace, among athletes, and a strong new interest in yoga research among active duty

military and veterans with pain conditions, combat stress and Post Traumatic Stress Disorder (PTSD).

With the emergence of higher quality yoga research, there is evidence that yoga has sizable and replicable effects for many health conditions. Although health is viewed as holistic in yogic traditions and aspects of health are clearly intertwined, research often targets specific areas such as physical health, mental health, and/or spiritual well-being. Some conditions that have been well studied include depression, stress and anxiety, irritable bowel syndrome, HIV, heart conditions, cancer, and chronic low back pain (CLBP). With CLBP, for example, a recent review documented consistent findings that yoga can improve function and decrease pain in people with CLBP. Additionally, yoga practice among people with CLBP reduces depression and pain medication use and improves quality of life.

There have been studies examining the potential benefits of yoga for cancer survivors, with the majority of research focusing on alleviating symptoms of radiation or chemotherapy, such as fatigue. A recent review concluded that yoga improves quality of life and psychosocial outcomes including depression in cancer survivors, but evidence is limited for supporting improvements in fatigue or sleep.

Considerable research has also been conducted examining the effects of yoga on cardiovascular risk factors, including a recent review concluding that yoga is a promising method for reducing high blood pressure (hypertension). Other reviews too report a variety of beneficial effects of yoga for cardiovascular diseases more broadly. For asthma, the breathing component of yoga has been linked to improvements in lung function and asthma symptoms, but has not proven to be better than standard breathing exercises for those specific outcomes.

While there have been studies conducted on the effects of yoga for other health conditions, these are mostly pilot and/or small research studies and the results are considered preliminary at best, or inconclusive. This is not surprising, given it is only recently that adequate research funding has been available to conduct the larger, more rigorous scientific studies.

It is important to note that the original purpose of yoga - to increase one's spiritual well-being or connection with the divine - has typically been a neglected area for researchers. The popularity of yoga as an exercise that is being done in health clubs has probably led to some de-emphasis of spirituality. We have seen a sort of translation of the spiritual system of yoga into a form of practice acceptable in a secular context, and an integral feature of yoga is that it adapts to each unique historical era and cultural context. While it is true that some people may be more likely to refuse to try yoga if spirituality is emphasized, it may be possible for the spiritual aspects of yoga to be woven

in gently as a feature of yoga practice while emphasizing other physical and mental health benefits as described in this article . To this effect, one study found that the reasons for starting versus continuing yoga changes over time, becoming mostly a spiritual reason after a period of regular practice. Many studies report that the practice of yoga enhances one's spiritual well-being.

YOGA AND MENTAL HEALTH

Depression. We found four relevant publications, including two reviews on the effects of yoga on depression, a description of studies on yogic breathing for depression, and one "summary" . The reviewing authors have reported that the studies reviewed showed a large variety of diagnoses ranging from "major depression or some other type of diagnosed depression" to "elevated depressive symptoms" . Although several randomized controlled trials (RCTs) reported beneficial effects of yoga interventions for treating depressive symptoms, the quality and quantity of the data from these studies appear insufficient to conclude whether there is substantial clinical justification to consider yoga as a treatment of depression. Compared to passive controls, the yoga interventions seem to be effective; when compared with active controls, not surprisingly, the effects are less conclusive . The study results are so far not sufficient in quantity and quality to determine whether studies with a focus on the *asanas* are more effective as compared to studies with meditation-focussed or *pranayama*-focussed styles.

Thus, there is a strong need to conduct more conclusive studies with high methodological quality and larger patient samples. Whether motivation of depressed patients could be a problem or not remains to be clarified. There has been an attempt to explore mechanisms of action and to understand the complete picture of the effects of yoga in depression looking at electrophysiological markers of attention, and neurotransmitters which were found to change with yoga.

Fatigue. We found one systematic review/meta-analysis evaluating the effects of yoga on fatigue in a variety of medical conditions. The review included 19 RCTs and included healthy persons as well as patients with cancer, multiple sclerosis, dialysis, chronic pancreatitis, fibromyalgia, and asthma . Overall, a small positive effect with an SMD of 0.28 [0.24–0.33] was found. This standardized mean difference (SMD) describes the difference in the group mean values divided by the respective standard deviation; a value between 0.3 and 0.5 can be regarded as small, SMD between 0.5 and 0.8 as moderate, and SMD >0.8 as large. For those studies that included cancer patients ($n = 10$), the treatment effect of yoga was 0.20 (0.15–0.24); for all other studies that did not include cancer

patients ($n = 9$), the effect was 0.46 (0.24–0.67) . Nevertheless, there are some studies on cancer-related fatigue which indicate that treatment effects of yoga could be improved in well-designed future studies.

Anxiety and Anxiety Disorders. There is one systematic review examining the effects of yoga on anxiety and anxiety disorders , a Cochrane review on meditation therapy for anxiety disorders (citing one yoga study), a description of studies on yogic breathing (which are also addressed in the systematic review) , and one summary .

Most studies described beneficial effects in favour of the yoga interventions, particularly when compared with passive controls (i.e., examination anxiety), but also compared with active controls such as relaxation response or compared to standard drugs. However, there are currently no metaanalyses available which would clearly differentiate this important issue. At least the AHRQ report stated that "yoga was no better than Mindfulness-based Stress Reduction at reducing anxiety in patients with cardiovascular diseases".

2.4. Stress. One systematic review describes the effects of yoga on stress-associated symptoms. Chong et al. identified 8 controlled trials, 4 of which were randomized, which fulfilled their selection criteria .Most studies described beneficial effects of yoga interventions. Although not all studies used adequate and/or consistent instruments to measure stress, they nevertheless indicate that yoga may reduce perceived stress as effective as other active control interventions such as relaxation, cognitive behavioural therapy, or dance.

To be able to clarify what the effects of yoga are on mental health in physical, chronic conditions, one must first determine what 'mental health' actually is. The most common definition of 'mental health' is given by the World Health Organisation. They postulate it as the following: "mental health is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to his or her community". As can be seen, in this definition multiple factors come forward, which are well-being, effective functioning and being able to contribute to the near outside world

In line with the medical perspective on mental health was purely seen as the absence of mental illness. Positive psychology postulates that this view does not do justice to the whole meaning of 'mental health'. Although negative symptoms such those of anxiety and or depression have a crucial impact on the individual, mental illness represents only part of a person's functioning and mental health (Westerhof &

Bohlmeijer, 2010). Keyes (2005) states that the main focus of the medical perspective is aimed at negative symptoms and to reduce these in order to bring forth the positive mental health of the individual. Seligman et al. (2000) join this statement by concluding that this medical perspective isn't capable of fully preventing mental disorders. Thus, it can be stated that, for an individual to be happy, not only should there be an absence of negative symptoms, but the presence of positive experiences as well. Furthermore, it is important to define these 'positive experiences'.

In sum, mental health according to positive psychology isn't just the mere absence of negative experiences, but the presence of positive ones as well. The positive ones can be divided into emotional, psychological and social well-being. Concluding, this view on mental health will be employed: 'improvement of positive experiences based on the hedonic and eudaimonic approaches, and a decrease in negative symptoms such as negative mood states (e.g. anxiety or depression) and illness'.

YOGA AND ITS RELATION TO POSITIVE PSYCHOLOGY

In particular, the practice of yoga is crucial to this study. The foundation of yoga is in line with the recent shift of focus to positive psychology, since the development of awareness and stillness is a key point in yoga. Whereas a purely medical perspective (which was the main focus before positive psychology arose) focused on merely reducing negative symptoms, positive psychology and yoga seek to accept the current situations and stimuli as they come and not to evaluate. Yoga fits with this approach, because it is a way of practicing these traits. Yoga for example focuses on the contemplative practice of focused attention and controlled breathing. Also, reducing external stimuli and viewing emotions as being temporary.

The conceptual background of yoga has its origins in the philosophy of ancient India. There are multiple schools of yoga, all of which have their unique way of practice (i.e., Iyengar, Viniyoga, Sivananda). The schools differ in elements of yoga, such as physical postures (*asanas*), breathing techniques (*pranayama*), relaxation and meditation which ultimately cultivates 'higher states of consciousness' It is often important to see the meditation and yoga practices outside the context of the eastern philosophy. Practically seen, the physical exercises (*asanas*) is associated with patient's physical flexibility, coordination and strength, whereas the breathing practices and meditation calm and focus the mind to develop greater awareness and diminish anxiety. Other reported beneficial effects are reduction of distress, improvements in resilience, mood and metabolic regulation (Büssing et al., 2012; Harder, Parlour & Jenkins, 2012).

The aforementioned dynamics of yoga consists of three key components that have known general effects on mental health, which are intention, attention and attitude. Exerting these three factors in yoga practice, it can increase muscular strength, range of motion, flexibility and sleep quality. Furthermore, it has been found that yoga can relieve stress and conditions of anxiety that impact physical and mental health conditions, primarily depression (Long, Huntley & Ernst, 2001). Especially for physical conditions, the effects of increasing muscular strength, flexibility and range of motion could be important since they impact the physical part of an individual.

More and more it is stated that negative mental symptoms are overlooked in the treatment of physical diseases. Because of the physical nature of the disease, the physical cause and symptoms draw most of the attention. Because of this reason, interventions with the aim of improving mental health have been overlooked as well. Though there is often relatively too little attention for mental health in physical conditions, there are clues that improving mental health in physical condition is rather important.

THE PRINCIPLES OF YOGA AND ADAPTATION OF THE TEACHING

In Vijnana Yoga there are seven principles that are guidelines for a conscious practice of Yoga, which also have implications in all areas of life. The Principles are especially important in dealing with mental health problems, but it is necessary to simplify and adapt them and teach them through experience and from it, and not as a theoretical explanation. Therefore, in the lessons there was no explicit talk about the principles, but they were present in the actual implementation of the principles by the teacher, and also in the framework of the lesson and in its content. I will address each principle, its connection to a teaching tailored towards mental health and its expression in class:

Intent – intentionality to the practice of Yoga was created initially by me and later also the older students brought their intent: they came to class or joined it with an Intent that flowed from within them. The most outstanding outward expression was keeping the framework of class and its rules. A ceremonial start of the lesson by standing firmly on two feet and breathing into the heart helped in creating the framework and the Intent. This was In addition to the rules of the lesson: all present in the class must participate (even if they are just lying on the mat resting), restriction of conversation only to practical talk on matters related to the body and Yoga. The intention was created by the framework of the class, but also helped maintain it. For example: in the case of a 14 year old student diagnosed on the autistic spectrum, who constantly rocked, and was also socially rejected. Clarifying the rule that class begins with standing posture on two legs, caused an

immediate cessation of rocking, which did not repeat throughout the entire lesson, and even in the next ones. Also a 13 year old boy who was struggling with a severe case of ADHD, and he too managed to quiet the swinging, both physical and of the mind by connecting to "the peace inside the heart", an act he performed in entering the Yoga room, even though it required from him an immense amount of emotional resources.

Breathing – it can be said in general that mental problems are expressed in the breath: difficulty breathing, rapid shallow breathing, irregular breathing, difficulty breathing from the nose and more. Since breathing difficulties accompanied the other difficulties mentioned earlier, the situation was such that the traditional breathing exercises, despite its great importance was too difficult for most students. Therefore the instructions were concentrated on directing the students to nasal breathing, attention to continuity of breathing in the poses and in transitions, and integrating breath in the movements such as in lifting hands and forward bends. Sometimes it was possible to add "special" practices as a game during class like: External Vayus, Simhaasana, Shitaly. Even those who were apprehensive about participating in these "weird" experiences watched the practitioners with interest, without interrupting or commenting.

Rooting – Connection to the earth, to the here and now and in fact – to reality. Rooting begun in the framework of the class and in the teacher, who served as an external anchor for the students arriving to class (a vital emotional rooting that corresponds the Rooting of the body in the ground), and it continued at the ceremonial start of the lesson (which was, as mentioned, a standing pose on two legs and breathing to the heart) and in choosing standing poses as the basis for most lessons. Standing poses, and the very essence of standing, were difficult for the students and so they often asked to skip them. When the poses were performed despite the objection, their effect was immediately evident in calmness, relaxation and focus. When the students were in a very diffused mood, balance poses combined with crossing the midline of the body were very helpful (e.g. Garudasana with slight variations), as well as performing standing poses in a sequence.

Connecting (and separating) – Creating a connection between parts of the body and feeling the connection, require an ability to distinguish between parts of the body, otherwise the body is experienced as a bloc. For this reason practice consisted of movement for each limb separately, followed by a coordinated movement. Connection to the center was important and difficult, especially given the difficulty to connect the abdomen and pelvis, that evoked negative reactions, especially around the issue of eating disorders and self-harm (mostly girls) and low self-esteem. Emotions arising in

these situations where: alienation, a sense of "I'm fat", and an attempt to ignore the area or an inability to feel it. The pelvic area spurred feelings of embarrassment and recoil, probably due to conventional sexual connotations in our culture. I tried to normalize the attitude to these organs by a direct and open approach, demonstrating on my body and answering all the questions that rose up explicitly or implicitly.

Expanding – Elongation and Widening – these principles helped create the ability to separate and connect, but were difficult to understand via verbal guidelines and so I used concrete instructions, for example: "reach up towards the ceiling or the wall" (instead of "elongate" or "expand"). The expansion and elongation movement was in contrast to the closed-ness, introversion and stagnation that characterized some of the students, and they brought about motion and vitality to the body. To strengthen this principle, I used a cyclic practice of opening and closing movements. For example: while sitting, creating a ground ball from the body by bringing the forehead in contact with the bent knees that were held by the hands, and opening to Navasana. An example for students who especially needed this principle were two girls with "selective muscular stiffness" that was reflected in the body as muscle spasm after which they were contracted but not due to pathology and physiology. With one of the girls the stiffness was combined with selective mutism, and in the second – in the context of sexual identity problems that were expressed by a desire to resemble a boy, and a denial of feminine characteristics such as flexibility. In both cases there was a slow but significant progress in the ability to open and extend the body's limbs, and I think that what contributed to it was performing these postures as a routine in class and therefore were not perceived as an attempt to change them, so there was no resistance on their part. In a more severe case of a boy where the stiffness and hunched back were a result of extreme shyness due to Obsessive Compulsive Disorder, there was no success in the group activities. I think that in his case a one on one framework would be more appropriate.

Relaxing the body – the Relaxation principle refers both to Shavasna which I referred to earlier in detail, and also to practicing in a relaxed way. The difficulty in integrating relaxation into the poses, and into life in general, stems from a difficulty to understand the concept of letting go and a fear of losing control that cause constant tension in the body. To illustrate the relaxation in the postures, I used mainly a preliminary contraction that enabled a following release, and also via instruction by touch. The touch was done carefully and gently, and always after requesting permission. For example, a boy diagnosed on the autistic spectrum was happy with touch in the upper body

that helped him relax at the beginning of Shavasana, but objected to having his feet touched.

Quieting the mind – this is the main difficulty and is part of the mental problems with which these young people struggle. The difficulty was expressed in constant or uncontrolled talking, intrusive thoughts and increased focus on the negative, as part of the pathology. I tried to enable quieting of the mind by connecting it to the activity that was carried out at the moment and with my guidelines, and also by maintaining the frame of the class that reduces the casual speech and communication between students (by limiting discourse to Yoga and body).

YOGA AND PHYSICAL FITNESS

Physical Fitness. There was one critical review which evaluated whether yoga can engender fitness in older adults. Ten studies with 544 participants (mean age 69.9 ± 6.3) were included; 5 of these studies were RCTs, and 5 studies had a single-arm pre/post-design. With respect to physical fitness and function, the studies reported moderate effect sizes for gait, balance, body flexibility, body strength, and weight loss. However, there is still a need for additional research trials with adequate control interventions (active and specific) to verify these promising findings.

One may expect that retaining physical fitness and improving physical functioning can have a positive effect on functional abilities and self-autonomy in older adults. Further studies should address whether or not individuals' self-esteem and self-confidence will increase during the courses, and whether or not regular classes may also improve social competence and involvement. A problem with studies enrolling elderly subjects can be compliance with the study protocol leading to low levels of study completion and long-term follow-up data. Future studies should investigate the most appropriate duration of yoga intervention and the most suitable postures and yoga style for the elderly.

Sympathetic/Parasympathetic Activation. There were 42 studies on the yoga effects on sympathetic/parasympathetic activation and cardiovagal function, that is, 9 RCTs, 16 non-RCTs, 15 uncontrolled trials, and 2 cross-sectional trials.

Most studies offered "some evidence that yoga promotes a reduction in sympathetic activation, enhancement of cardiovagal function, and a shift in autonomic nervous system balance from primarily sympathetic to parasympathetic".

However, some of the studies included in the review showed less clear-cut or even contrasting effects. Because most of these effects are short-term phenomena, more rigorous work is needed.

Another lacuna is that there are very few studies which have studied plasma catecholamine levels and most of them are early studies. *Cardiovascular Endurance.* Raub's literature review, which included 7 controlled studies, reported "significant improvements in overall cardiovascular endurance of young subjects who were given varying periods of yoga training (months to years)". Outcome measures included oxygen consumption, work output, anaerobic threshold, and blood lactate during exercise testing. As expected, physical fitness increased in adolescents or young adults (athletes and untrained individuals) compared to other forms of exercise, with a longer duration of yoga practice resulted in better cardiopulmonary endurance.

CONCLUSION

This meta-analysis shows that yoga can have a positive effect on mental health in different physical, chronic conditions. This positive effect entails a possible reduction of negative symptoms such as pain, fatigue and stress and an increase of positive symptoms, such as happiness, self-awareness and self-realization. This study gives rise to the thought that yoga could be a good addition to positive interventions aimed to improve mental health.

Yoga classes can be a tool for connecting between the physical and mental aspects that is essential for youth coping with mental difficulties, who are hospitalized or study in various mental health institutions.

Yoga can contribute to raising awareness of the body and various bodily sensations, as a complement to the therapeutic and educational emphasis that is usually centered on the mental and verbal aspects, at times neglecting the body. Yoga can improve body and perception awareness, help deal with the side effects of medication and other related physical problems, thus improving the overall feeling.

These reviews suggest a number of areas where yoga may be beneficial, but more research is required for virtually all of them to more definitively establish benefits. However, this is not surprising given that research studies on yoga as a therapeutic intervention have been conducted only over the past 4 decades and are relatively few in number. Typically, individual studies on yoga for various conditions are small, poor-quality trials with multiple instances for bias. In addition, there is substantial heterogeneity in the populations studied, yoga interventions, duration and frequency of yoga practice, comparison groups, and outcome measures for many conditions (e.g., depression and pain).

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