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## **Yoga for Anxiety Management in the Workplace**

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Additional information is available at the end of the chapter

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### **Abstract**

Anxiety is a potential cause of serious influence in a person's daily life. This chapter is focused specifically on the effects of the work environment factors in disease development and progression. Working environments are places of significant sources of stress: they put us in connection with our duties and expectations (often not coincide with reality) and with a "forced socialization." Especially forced socialization is to be considered a main source of stress in work places, inducing negative outcomes in work and social relationships. The psychosocial risks of work places can so be defined according to design, organization and management of work as well as to social and environmental contexts that may lead to damage of physical, social and psychological domains. Stress can then be defined as a pattern of emotional, cognitive, behavioral, and physiological reactions to adverse and noxious aspects perceived as the contents of the working environment. Thanks to the beginning of psychosocial research on the working environment, the impact of some aspects of the work environment on health has become an object of study, as the interventions to mitigate it. Yoga, meditation, and mantra techniques, as described in this work (presenting others' experiences and two of own current projects, used in a hospital workplace to control the condition of occupational stress but also in a clinical sample), showed the potential in considerably reducing anxiety and mood symptoms.

**Keywords:** anxiety, yoga, work, environmental factors, stress, coping and vulnerability, prevention

## 1. Introduction

This perspective is deep-rooted in the history of medicine. From this perspective, George Engel introduced the term "biopsychosocial approach" as a privileged model for decoding and comprehending in many ways health and stress as existential processes, and to articulate forms of care and of taking responsibility [1]. The biopsychosocial model is based on the paradigm of complexity, in sharp contrast with classical biomedical reductionism, as well as the hierarchy of the sciences. It adopts the perspective of the General Systems Theory developed by Von Bertalanffy, which considers a set of events interrelated as a system with specific properties and functions depending on the level at which it is located with respect to a larger system. The systems theory in fact claims that all levels of an organization are interrelated to each other, so that changing one affects the other, mitigating the dichotomy between holism and reductionism [1]. The model refers to three basic principles: free dialogue, relationship, and humility. In other words, it aims at looking at the person as a "whole" genetic element (bio), the subject of discussion and decision (psycho), as well as a historical, cultural, and familiar subject (social). The axioms of the model are inclusiveness (understanding of diversity) and non-exclusiveness (putting aside what is regarded as their competence), the answers to which are total and global whatever the point of entry into the system (the biological now, psychological time, social hour). The centrality of this model has been confirmed and validated by almost uncountable literature marking the transition to a person-centered medicine [2] and it is now of widespread knowledge that biopsychosocial screening, rather than a compartmentalized approach, can help plan a more effective treatment and help an early and useful stress management. Human beings tend to form themselves through the development of groupal complex systems affecting the three main areas explored in the biopsychosocial model. Therefore, one must bear in mind that every action must always consider the construction of or refunding the mind-body integration. A person's discomfort cannot be considered only in terms of somatic or psychic discomfort, because any discomfort brings the indissoluble unity of consciousness of the self. This should be emphasized because not everyone knows how to use this knowledge in the care of the person as a whole.

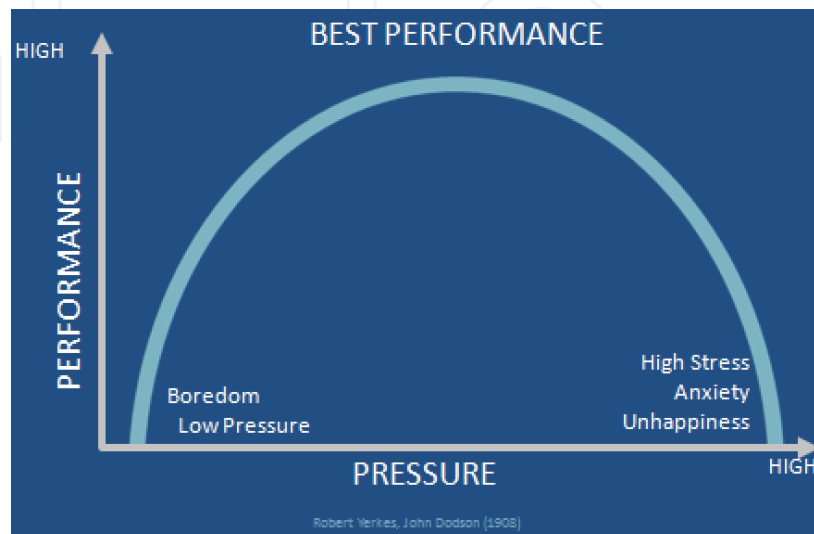
## 2. Work, a question of balance and psychosocial aspects

Workplace can be assumed as a model of a complex system involving biological, psychological, and social aspects, so we have to rely on a biopsychosocial approach to deal effectively with any issue concerning individuals and teams. These three dimensions are interlinked, in fact effective management of health and safety in the workplace is important and recommended to individuals and society alike. This approach is particularly important and relevant in times of economic uncertainty when it is essential for companies to maintain high productivity levels despite the decreasing number of resources and when mistakes and accidents are most likely to occur [3]. The psychosocial risks should be taken in to account when designing, organizing, managing, and evaluating the social and environmental contexts that may lead to damages of the "physical, social, and psychological health." In the '60s, psychosocial research in the work

environment highlighted the impact of some aspects of the workplace on health. Today we have strong evidence of how the work-related stress exposes the individual to danger, inefficiency, and error: stress increases the production of cortisol, damages the hippocampus, and causes damage to memory and cognitive skills (which can be reduced by up to 60%) [4].

But what is stress? In the '50s Selye introduced the term stress in everyday language and such term began to take on the meaning which it still retains, also in the field of psychology. Stress, a term that means "pressure," derives from the field of engineering; it is used to refer to any force that is applied to a body in order to test its durability under stress. Over time, this term was progressively used to refer more specifically to "a state of non-specific stress of living matter, which is manifested by morphological transformations tangible in various organs, particularly in the endocrine glands that are under the control of the pituitary" [5,6]. Originally the syndrome "just being sick" covered the stereotypical response of an organism to a wide range of physical, biological, or chemical agents. Selye was the first to use the term stress to describe a range of physical and psychological responses to adverse conditions or influences [7]. Stress occurs when we have to respond to a stimulus from the external world: this response consists of a behavioral adaptation and the activation of biological systems (psycho-neuro-endocrine) in such a way to prevent potential negative consequences and, where it is not possible to solve the situation, possibly develop forms of adaptation. The first important consideration relates to the fact that stress is the result of a process of human adaptation to the environment. There are some specific mechanisms that underlie the identification of a response to stress: a) a dynamic stimulus-response reaction, b) the required adjustment in order to respond appropriately and effectively to the stimulus, c) the high energy (mental and physical) needed to achieve this adaptation effort. In addition to the "active" and "passive" reaction, characterized by inhibition, recent studies have demonstrated the existence of ways of reacting with a great intersubject variability. We filter the stressor by attributing different and personal meanings and values to it depending on a wide range of constitutional and experiential factors, and also on the context. When exposed to stressful situations, the individual puts in place strategies that modify or attempt to modify his/her environment. These strategies are strictly individual and are linked to the personal characteristics of the subject and their historical experience. The term stress stands for stressful event (or stressor), a term that describes the stimulus factor that causes the reaction. Stressors can be major factors (the loss of work), minor factors (small facts of everyday life, or hassles), acute factors (accidents) and chronic factors (a very competitive business environment) [8]. The stress effect is potentially pathogenic when the conditions from which it is derived are chronic or recur with some frequency. Selye also distinguished between eustress (or good stress) and distress (bad stress); such terms were originally included in the broader definition of stress but were immediately indicated as distinct from one another. Selye stated that stress is an inevitable consequence of living, but that distress appears when the requests to which the person is exposed (both in the psychological and physiological dimensions) overtake the capacity and energy that the person has or believes to have to maintain the homeostasis. The stimulus demand can, therefore, have a more or less acceptable meaning [7,9]. Holmes and Rahe, in the construction of the "Social Readjustment Rating Scale [10]," discovered that each stress can be classified into distress and eustress, where the first is caused by a response considered disproportionate in size, while the eustress is caused by a response considered acceptable, which creates a moderate level of

tension enabling to successfully address the perceived challenge. This is, however, only one aspect of Eustress. The concept of an optimal level of stress derives from the studies of Yerkes and Dodson Law that explained how stress is beneficial for increasing the performance until it is moderate, after surpassing a certain level of stress the performance will deteriorate according to an inverted “U” diagram—see Figure 1 [11,12].



**Figure 1.** The stress–performance relationship according to Yerkes and Dodson [12] modified.

In order to clarify the connection between the theory of Yerkes and Dodson and Selye’s work, it has to be clear that the effect of any stimulus depends on how each individual interprets it and chooses to react to it. It is the individual that determines whether the stressor will generate eustress or distress. The eustress is the primary result of a positive perception of the stressor, while the distress is the result of a negative perception. The classification depends on how the stressor is perceived by the individual, on which kind of value is assigned to it. Selye suggested that learning how to respond to stressful stimuli with positive emotions, such as hope, maximizes eustress and minimizes the distress, whereas responding with negative emotions, such as despair, greatly increases the distress [9]. In the perception of stressor, and when assigning of its meaning, a key characteristic of the individual is involved: the locus of control (or self-efficacy); people with an internal locus of control (believing they can control and master all external situations) tend to perceive and to respond to stressors quite differently with respect to people with an external locus of control (believing they cannot at all control and master all external situations) [13]. Self-efficacy is the belief of being able to control the environmental challenges by deploying an adaptive action, and, according to the social cognitive theory, strongly influences the effectiveness of self-perceived behaviors being positively associated with adaptation [13]. In fact, it is positively related to an active strategy and negatively to a passive reaction [14]. In the aforementioned works, Selye introduced the notion of “general adaptation syndrome” to describe the way in which the body copes with stressful events; he distinguished three phases that follow this order: 1) alarm phase: it is activated by the autonomic nervous system in the occasion of intense stressful events; 2)

resistance stage: the body reacts to stress and, if the stress is intense, there are transient events such as the enlargement of the adrenal glands, gastrointestinal ulcers, etc.; 3) exhaustion stage: if the stressor persists or if the body is not able to put in place appropriate responses, the body undergoes irreversible responses, which can include death. The distress, specifically, is characterized by a stage of alarm, a stage of resistance, and a stage of functional exhaustion. R.S. Lazarus has integrated Selye's model with the purely cognitive aspects related to the subjective perception of specific stressors, creating a more complex model [15,16]. In his model, the same event, as already mentioned, may have different meanings in different subjects, and it is unquestionable that when confronted with stressful factors different people react in different ways with quite different outcomes. The ideal response requires strategies which are active but also multiple, flexible, and tailored to the specific factors or stressful events in action. The stress response is then modulated in two ways by the psychological characteristics of the individual: in the process of perception and processing of the stressors, and in coping with these factors.

### 3. Workplace and anxiety

Working environments put us in connection with our duties and expectations (which often do not coincide with the reality of the context) and with a "forced socialization." This is a clear model of stress defined as a psychosocial phenomenon; therefore, specific interventions have to be based on the identification of stressors and their original context. Over time, this has led to the identification of two areas of research: 1) study of stress measures, scales, and 2) tools for assessing the effects of stress on individuals. We must remember that the measured stress level may not be strictly related to the work environment and that subjective aspects play a decisive role in the type of reaction. Being subjective, this measure allows us to identify the sources of stress that have occurred in causing discomfort and to certify its effects only [4]. If the stressful events are easily identified, it is much more difficult to predict the subjective reactions to them. In fact, as already stated, the individual response to stress depends on constitutional and experiential factors. There are also particular types of stress and forms of anxiety (i.e., stress response) that could be directly related to the workplace, like "stress in social situations." This is a particular stress that arises from forced participation in social situations perceived as anxiety provoking. People affected by stress in social situations are very upset when forced to interact in social gatherings, tend to avoid public speaking, show anxiety in group settings and invent excuses to avoid encounters with people they do not know; furthermore, those who exceed in this stress often feel uncomfortable when talking with "superior" people of the opposite sex and/or with whom they have never spoken before. Therefore, the resulting stress involves a state that may evolve from an acute condition (where the mind/body is enabled to effectively react to external events that must be addressed and solved) to a chronic condition in which stress remains constant and generates harmful effects on the physiological functions with repercussions on the ability of interpersonal adaptation. Another kind of anxiety that could characterize a person is also "social concern": it is closely



related to the activation and the consequent negative emotional condition of tension that occurs in situations in which the subject feels under observation. Individuals with high levels of social concern are very uncomfortable when thinking someone is looking at him, as he often fears negative evaluations by others. Feeling apprehensive about someone becoming aware of their shortcomings, or not approving what they do, is a cause of great anxiety for these individuals, especially when the feared opinion comes from their superiors. People with high social concerns usually see their image as is potentially perceived by others, and believe that physical appearance is very important to establish positive and functional relationships with others. This induces a dysfunctional groping to inspire confidence at all costs, with the negative and unwanted pitfall to behave ridiculously. These elements can originate a condition defined mismatch [17-19]. Concerns about the image perceived by others can lead to the complete avoidance of any potentially stressful situations and, consequently, to a state of interpersonal closure and loss of motivation to affiliate to others [15,20]. In this context, it is very important to prevent negative stress, distress, which occurs when the situation needs an effort to adapt to it that exceeds our perceived ability to achieve it. Since the '60s, there has been a growing awareness on the unavoidable essence of stress as a human condition while coping skills and resources make the difference in the outcomes of the adaptation process [16,21]. The features involved in the modulation of the stress response strategies are called coping skills, and the whole process of reaction and coping of stress is referred to as "coping" [15,16]. Studies on the so-called "good copers" clearly show that these people persistently believe that they will be able to cope with the stress: they are practical and directly address the issues straightforward; on the contrary, "bad copers" are characterized by disappointment and pessimism [22,23]. There are quite recurrent types of coping, which is why we talk about "styles" of coping. They are crucial in the success to achieve personal goals [24-27]. The most common coping styles can be summarized as follows:

1. **Combat:** this style is characterized by the challenge of defeating the stress: the person sees the situation of stress like a challenge, has an optimistic view of the future, and believes that it is possible to exercise control over the stress. This kind of person reveals a coping style aimed at direct confrontation [27]. Therefore, those who adopt this strategy have a so-called internal locus of control, they want to know as much as possible about their own condition, their source of stress and the context and actively change their lifestyle in order to preserve their health; this strategy can be defined as an active, positive coping, because it represents a tendency to actively confront and cope with stress and protects from anxiety. The optimism that characterizes this style of coping has beneficial effects on the health, well-being, and the quality of life of those who adopt it. Recent research confirmed these assumptions [27]. The combative coping mediates these effects positively, while fatalism, anxious worries, and despair mediate these effects negatively. However, it is not enough to be optimistic, if you do not take a combative style of coping. The combative style induces lower levels of anxiety and demoralization, empowers individuals in finding answers for discussion and gives them the feeling they are able to control events, at least partially: "I see this stress as a challenge," "I am determined to overcome it," "I am very optimistic;" combative people adopt more flexible and differentiated cognitive and

behavioral strategies, such as "I am actively trying to improve my health," which promote a more positive view of the events. As a result, and as mentioned above, this style is associated with lower psychological morbidity and a greater sense of personal control [27].

2. **Avoidance-disclaimer:** this strategy is very complex, it is generally characterized by the tendency to not directly address any issues related with stress, and is associated to the use of the refusal defense mechanism (to avoid seeing the unpleasant aspects of reality); it is very common, often plays a really useful role in protecting from anxiety. However, if taken to the extreme and used as the only form of defense, it can cause problems. It has been divided into denial of adaptation and maladaptive avoidance; the first can be defined as a natural method of emotional self-protection, which has positive effects on health, so it was also called "healthy denial" by Druss in 1988 [28]. The maladaptive avoidance, instead, splits up into more extreme forms of denial that can lead to poor cooperation and cause strong anxiety when it is no longer effective as defense mechanism. A high level of avoidance, used as the only coping strategy, can also lead to an unrealistic perception of self-efficacy.
3. **Fatalism:** it is a strategy characterized by an attitude of fatalistic resignation and passive acceptance of the stress. People who adopt this strategy recognize the gravity of the situation and believe they have little control over events. Therefore, they accept what fate ordained with resignation as if that was their destiny. Therefore, we must point out that the tendency to perceive external events as related to fate is typical of those who have an external locus of control, a place of external control, which causes poor adaptation to the stress.
4. **Anxious preoccupation:** it is a strategy characterized by constant feelings, the feelings of danger, stress, and high level of anxiety. Stress assumes a central position in person's existence. It is negatively related to social and emotional functioning. Those who adopt this style of coping are continuously searching for reassurance, demand for visits, or otherwise escape from the context because it is too distressing. It is positively related to coping style despair [27].
5. **Despair:** it is characterized by feelings of loss and the oppression; it is related to high levels of anxiety, poor cognitive strategies, and the belief of having little control over events. In fact, there is a correspondence between despair and demoralization, which leads to affective symptoms of existential distress, cognitive tendency to pessimism, sense of personal failure, lack of motivation to deal with the event, feelings of social isolation and alienation [24-27].

### 3.1. Burn out, source of stress in workplaces

The 'burn out' syndrome is a stress-related phenomenon, even if distinct from it. It happens particularly to people working in the social sector and in the helping professions. Burn out consists in a progressive loss of motivation, idealism, objectives and the meaning associated with them, a decreased perception of social utility of one's own work. The "burn out" condition does not coincide with stress but it induces stress in a work environment when the balance



between the following three important factors is lost: a) required level of performance, b) control over one's own work, c) reward and gratification. In order not to get into a condition of stress, the worker has to perceive these three factors as balanced. With regard to the analysis of occupational stress the cognitive aspects are very highlighted, assuming that an event can have very different effects on each individual. To better understand the development of burn out it is useful to introduce also the concepts of "work stress" and "work strain." "Work stress" is an objectively measurable occupational stress (an acceptable level of overtime); "work strain" is defined as the particular emotional and mental reverberation of the same condition or activity on different people (e.g., the effects of demotivation on a single person in relation to his/her actual potential professionalism or his/her culture) [4]. Only in certain circumstances can an experience of stress turn into a real illness. Since the autonomic nervous system and the neuroendocrine system mediate the body's response to stress, as a result of prolonged and repeated stress a normal physiological response can turn into a meaningful damage to health, especially affecting the cardiovascular, endocrine, gastrointestinal, and immune systems [4]. When the need to tackle stress is over, the chemical responses previously activated should terminate. But when the physiological reaction to stress is not able to recover, the areas assigned to the production of adrenaline and cortisol continue their secretion, creating chronic stress, this in turn leads in particular to systemic alterations that in turn cause physical and psychological problems, such as behavioral and emotional symptoms like recurring irritability, poor concentration, decreased performance, tearfulness, changes in appetite, loss of self-esteem, sleep disorders, cardiovascular disorders, tendency to hyperglycemia, headache, and poor functioning of the immune system [4].

### 3.2. The importance of stress prevention in working organization

The high psychological and social costs that a person has to pay as a result of negative experiences (stress) at the workplace is becoming an increasing problem not only for the workers or the management, but also for organizations. For this reason, organizations are gearing up (e.g., by promoting yoga courses for employees). In the past, it was noted that the reduction in efficiency due to work stress probably has comparable effects to those caused by the strikes on the economic front [4].

Potentially stressful factors at work involve the relationship with work environment and work content (material factors), the role people play in the organization (organizational factors), and interpersonal relationships (psychosocial factors). Referring to the role that a person plays in the organization we can talk about role-stress when there is a discrepancy between the actual role and the role to that the worker wishes to reach in the organization (this phenomenon is called inconsistency of position).

The classical three levels of prevention are:

1. **Primary prevention**, the purpose of which is to decrease the incidence of the arising of the negative phenomenon, it consists in an attempt to prevent the development of a discomfort in a population at risk.

2. **Secondary prevention**, which tends to reduce the prevalence of morbidity through the curtailment of the period, the spread of the stress.
3. **Tertiary prevention**, which tends to mitigate the effects of negative factors on those affected.

The timing of the intervention with the onset of pathological symptoms is, therefore, the discriminating factor between these three levels. The earlier the preventive intervention takes place, the more efficacy it has in preventing potential damages generated by work processes and environment. Developing trainings aimed at improving stress management can help to reduce stress through greater mastery of the work process, strengthening self-esteem, and developing a higher sense of self-efficacy, but also improving motivation and mood. In the process of designing the work flow it is essential to take in to account not only ergonomic principles, but also the need to develop proper systems of performance evaluation, based on known criteria (preferably shared), on a transparent communication and on constructive feedback from the management. Such evaluation system will concretely reduce stress and increase the sense of control and involvement, facilitating the employees in the assignment of meaning to their activities and contribute to self-esteem [4].

### **3.3. Mental disorders in the EU, the importance of an early intervention**

It is estimated that a third of the European population suffers from mental disorders [29]. Psychiatric disorders are the prominent cost of disability-adjusted life years worldwide [30]. Anxiety is one of the most common psychiatric disorders affecting adults and young adults [29,31-36]. Anxiety disorders have the potential to cause serious interference with a person's daily life, work, and career [29,37]. It is also known that all pharmacological treatments with benzodiazepines can cause troublesome side effects, including anterograde memory impairment, sedation, and the risk of dependence; therefore, they are not recommended for long-term use [38]. Furthermore, response to these treatments tends to be highly variable, ranging from 40% to 70% [39-42]. These limits in terms of efficacy and tolerability often result in poor patient adherence to medication and, thus, long-term remission is often difficult to achieve [43]. On average, only a third of patients achieve remission within a year of follow-up, while patients who do achieve an initial response often relapse [44].

Can we, therefore, intervene before the appearance of a psychiatric disorder? Here stands the importance of primary prevention, which is finalized to prevent pathogenesis preserving the subject from the risk of taking pathogenic behaviors. The literature has largely emphasized that improving "coping style" to stress, and all the problems related to it, may prevent and decrease anxiety and its consequences on working processes (and on social functioning as a whole). In this perspective yoga can be a very effective and promising approach.

### **3.4. Yoga: A biopsychosocial approach to health**

Why should organizations promote yoga and not a generic physical activity for their employees? What is the difference between generic physical activity benefits and yoga benefits? The difference in benefits has been shown in a fairly recent study made by Bonura: both fitness

and yoga lead to an improvement of psychological health, although the changes obtained with yoga were generally higher and more durable [45].

Yoga has shown greater enhancement in psychological health than the simple physical exercise, substantiated by the decrease of anger, anxiety, and depression, and increased global wellness, positive overall effects, and feeling of an increase of self-efficacy. Clance and coworkers (1980) concluded that yoga is an effective method to improve the image of the body and, consequently, the self-image [46].

We need to point out that yoga is a time-tested, *ante litteram*, biopsychosocial approach to life: it includes health in the body, peace in the mind, and helps to develop good relationships and harmony in the society; moreover, the body-mind-spirit unity is a key feature of the yogic approach to health and happiness. Yoga techniques range from yoga postures (asanas) and purification techniques (kriyas), more focused on body health, to breathing techniques, cognitive strategies, and meditation for clarity of mind and emotional balance (pranayama, gyana, and dyana), to ethical codes of conduct aimed to establish harmony in the society (yama and nyama). The yoga approach to life is very reliable with the general system theory and to the work of Nicolis and Prigogyne [47] on dissipative systems: life is seen as a flow of energy where the individual (subsystems) is part of the whole (the bigger system) and is striving to keep its harmony (sattva) utilizing energy from nature to implement proper actions and assuming a proactive attitude toward events. The imbalances of the system can be of two types: excess of *tamas* (inertia) like in depression and misunderstandings or excess of *rajas* (activity) like in anxiety, and all yoga techniques are aimed at recreating balance (sattva) at physical, psychological and social level. Often yoga is seen as an intangible and philosophical practice that is not suitable for the modern world of competitions and the fast pace that characterizes the work environment. This misunderstanding is due to a lack of knowledge and a cultural bias; in fact Patanjali (a prominent character in the yogic tradition that systematized the discipline in his “yoga sutras” (400 BC)) defines yoga as “skill in action” [48] The usefulness of yoga postures and breathing techniques for general health, stress management and anxiety is easy to understand and to demonstrate and there is a growing body of studies showing evidences in this direction [49,50]. But yoga can also provide cognitive tools to approach stressors in a healthy way. In fact yoga promotes a proactive approach to events and challenges, encouraging the apprentice to develop a keen self-awareness and to take responsibility for how he perceives events and people and for how he responds to events and people’s behavior. When properly understood and followed this “practice” leads to a balanced and constructive combative attitude toward stressors. Yoga can be helpful for the development of an effective strategy for reducing tension, through short and simple exercises that are easy to replicate autonomously. In particular, for the constant attention paid to the body–mind relationship, yoga seems to be particularly influential on the activities related to the sympathetic system and, therefore, on the typical symptoms of anxiety: accelerated heartbeat, palpitations, tremors, sweating, increased blood pressure, dry mouth, avoidance behaviors, restlessness, etc. [51]. Yoga can also stabilize mental activity and enhance brain function and resilience to stress [52-54]. Yoga and breathing techniques can also favor a regular nasal breathing, with better lung expandability. Some yogic exercises of relaxation and cleansing of the nasal

passages are also very effective in the prevention of sinusitis and rhinitis, and the resulting pharyngitis, laryngitis, and tracheitis [55]. Specific exercises can procure greater elasticity in the muscles needed for breathing, which is important because respiratory deficits are due in large part to the lack of movement secondary to a sedentary lifestyle. Yoga breathing techniques can also prevent excessive tachycardia and hypertensive crises related to anxiety, because of their help in regularizing breathing. Finally, it is also known that stress and sleep disorders, such as insomnia and frequent interruption of sleep, can be fought with specific breathing techniques associated with sequences of dynamic yogic exercises [56]. Yoga can be also considered one of the strategies to cope with pathological conditions that have already taken place (secondary prevention), like Generalized Anxiety Disorder. Today there is enough evidence to consider yoga to be a beneficial, low-risk, low-cost integration to the treatment of stress and anxiety [57-60]. The antidepressant efficacy is also important as demonstrated by quite numerous studies [61-66]. Yoga could be considered a complementary therapy to classical psychological and psychiatric approaches, because many traditional yogic exercises have a therapeutic value. For these reasons today more and more doctors and psychologists recommend yoga as a relaxation technique.

### 3.5. Yoga and work organization

There are many evidences supporting the hypothesis that the introduction of yoga and meditation in the workplace at a large scale will benefit both the single workers and the performance of teams and organizations. We think that can be useful to analyze the “access barriers” that yoga shows for organizations and also to highlight cases where these barriers have been surpassed:

1. **Language and cultural bias:** yoga is perceived by many managers and decision takers in the corporate and institutional world as unpractical, philosophical, esoteric, religious, and anyway as something that concerns personal life and personal choices. To overcome such preconceptions the yoga teachers need to develop the skill to present yoga and conduct yoga classes with a secular language, introducing scientific evidences of the benefits of yoga. It is a huge cultural experiment that offers very interesting horizons of integration of eastern and western culture.
2. **Budget allocation:** in the middle of the shrinking of budgets, HR departments struggle to give priority to initiative that do not seem very concrete and with short term results. Again to overcome this problem it is necessary to show scientific results both in terms of health prevention and health strategies (and also the reduction of lost working hours) but also in terms of increased personal and team performance.

Some successful initiatives highlighted the potential of introducing yoga and meditation in working organizations, suggesting how to overcome the aforementioned barriers.

**The Project Response** has been supported and funded by the EU Commission’s Directorate General (DG) Research to develop knowledge and understanding on the degree of alignment between companies and their stakeholders about what Corporate Social Responsibility (CSR) entails. The main objective was to study CSR at the level of individual manager’s behavior,



assessing the relative effectiveness of diverse training interventions on the development of social consciousness in managers. It was conducted from 2004 to 2007 by a multidisciplinary team of academic researchers from a consortium of leading business schools in Europe (INSEAD, France; Copenhagen Business School, Denmark; Università Commerciale Luigi Bocconi, Italy; Leon Kozminski Academy of Entrepreneurship and Management, Poland) and a training consultancy (Impact, Austria). Part of the study was aimed to evaluate, on 93 managers, the impact on their CSR behaviors after following stress management and meditation programs. In the words of Maurizio Zollo, leading the research team, “meditation and relaxation techniques seem to enable managers to break free from patterns of decision making driven by short term outcomes, self interest and reliance on safe solutions to embrace more proactive and innovative approaches to social and environmental challenges” [67]. One might even posit that the strain placed on managers in the workplace leads to short-term time horizons, narrow self-interests and familiar approaches to problem solving. This would, thus, prevent sound decision-making based on search for creative solutions to unstructured problems, on caring and trusting attitudes and on long-term views of the implications of one’s decisions on broader audiences internal and external to the company [67].

**Mindfulness Based Stress Reduction:** the roots of this method are in the Tibetan Buddhist tradition. Mindfulness Based Training was conceived in a hospital setting and developed by Jon Kabat-Zinn at the University of Massachusetts Medical Center, it uses a combination of mindfulness meditation, body awareness, and yoga to help people become more mindful. His specific secular and scientific approach to yoga and meditation coupled with the effectiveness are the base of the wide success of the program in corporations and organizations worldwide [68-70].

**TLEX Program:** TLEX program is another positive example of how to overcome the barriers expressed in points 1 and 2. The origin of this set of programs is the Sudarshan Kriya Yoga (SKY), a complete yoga method created by Sri Sri Ravi Shankar in 1982. The TLEX program started from the personal experience of some entrepreneurs and managers that experienced SKY and, seeing the potential of introducing such techniques and cognitive strategies in their working environment, requested Sri Sri Ravi Shankar to tailor specific programs for their employees and managers. Starting as a very innovative service, TLEX is now offered in corporations and organizations worldwide [71,72].

#### **4. Two studies focused on yoga and health — The Milan “Fatebenefratelli e Oftalmico” Hospital experience**

The promising results of the scientific research, embracing both the neurophysiologic approach and the management approach, the “commercial” success of programs based on yoga and meditation, and positive case histories (like the program conducted at Fatebenefratelli Hospital in Milan, Italy) show the important impact that yoga training has on individual workers and organizations in general. We are still in the initial phase; much more has to be done.

Here we describe two studies regarding yoga and health.



In the first study we applied a particular yogic protocol called SKY (which stands for Sudarshan Kriya Yoga) as a treatment for patients affected by Generalized Anxiety Disorder and depression.

In the second study that we present, yoga, meditation and mantras have been used to deal with work-related stress for employees of a hospital.

#### 4.1. SKY for anxiety disorders

A sample of patients (n=69) diagnosed and treated for anxiety and depression disorders was included in an experimental treatment with SKY techniques [73]. The adult participants (from 25 to 64 years old) were consenting persons with primary diagnosis of DSM-IV-TR Mood (n=18), anxiety disorders (n=39), or mixed condition (n=12) [74]. All patients signed informed consent for participation in the study. The sample was divided in two groups:

**Group 1** undergoing pharmacological treatment, SKY treatment and participating to self-help group weekly; Group 1 subjects had a minimum of six months of stable condition due to standard pharmacological treatment with appropriate dose of antidepressant and/or anxiolytic.

**Group 2** was not treated with psychiatric medication for at least six months prior to the study. This group received only SKY treatment and participated to self-help group weekly. These subjects were characterized by poor response and/or inadequate adherence to pharmacological treatment, had at least six months of participation to self-help groups and stable conditions.

The procedure of SKY was documented previously [62,63,74,75]. SKY was taught by trained, certified facilitators. The experimental group participated in an intense SKY workshop consisting of 10 sessions in two weeks followed by weekly SKY follow-up classes for six months. Each session lasted approximately two hours.

Assessments were done by a psychologist, uninvolved in treatment, in a quiet ambulatory environment. The severity of anxiety was assessed using Hamilton Rating Scale for Anxiety (HRSA) [76] and Zung Self-Rating Anxiety Scale Inventory (ZASI) [77]. The severity of depression was assessed using Hamilton Rating Scale for Depression (HRSD) [78] and Zung Self-Rating Depression Scale Inventory (ZDSI) [79]. The global symptom situation of patients was also assessed using Symptom Checklist-90 Revised (SCL-90-R) [80].

One of the aims of the study was to verify if SKY was an efficacious adjunctive treatment in pharmacological resistant, anxious-depressive subjects. Other objectives are related to neurophysiological evidences of the effects of SKY on the autonomic nervous system; the data are currently in evaluation for a specific publication.

Table 1 shows the results on anxiety severity assessment both with a subjective and an objective measure (ZASI and HRSA, respectively). Statistical analysis is in press [73], but some results are summarized in Table 1. All the tests measuring anxiety showed a significant improvement, which reaches statistical significance. The Global Score Index of SCL-90-R also showed a marked improvement from the baseline onward, the main effect of medication consumption over GSI scores being not significant.

Statistical analyses have shown that SKY therapy significantly reduces the levels of anxiety as measured by different scales.

SKY seemed to promote a meaningful remission of anxiety symptoms in the outpatients but the study should be replicated on a larger clinical sample for a more in-depth analysis of the efficacy of SKY Protocol and a longer follow-up is needed to evaluate the response maintenance.

Scale	Group	T0	T1	T2	T3	P
<b>Hamilton</b>	Medicine n=30	16,9	12,9	8,8	11,4	P <0.001
	No Medicine n=25	16,6	8,9	8,5	7,6	P <0.001
<b>Zung</b>	Medicine n=30	44,4	36,7	36,6	35,3	p <0.001
	No Medicine n=25	43,3	34,2	32,6	31,8	p <0.001
<b>Scl-90</b>	Medicine n=30	1,27	0,86	0,79	0,78	p <0.001
<b>General Symptoms Index</b>	No Medicine n=25	1,21	0,75	0,71	0,56	p <0.001

In the table the mean scores are reported. Statistical analysis was conducted by ANOVA (see text for details)

T0 (before SKY treatment), T1 (after 15 days of SKY training), T2 (after 3 months), T3 (after 6 months).

**Table 1.** The improvement of Anxiety level

#### 4.2. Yoga, meditation, and mantras to deal with work-related stress for employees of a hospital

This project took place at the Fatebenefratelli and Ophthalmic Hospital in Milan since 2012, and it is currently ongoing as a quality project of the hospital.

This intervention includes five lessons, two hours weekly; every lesson is structured as follows: 30 minutes for relaxation, breathing, and full asanas (yoga postures to promote lengthening of column and muscles); 60 minutes for asana specifications; and 30 minutes for meditation with mantra listening.

The experimental sample is composed mainly by females (n=90) and to a lesser extent by males (n=10), the mean age being 47.51 yrs (sd=8.3).

The work-related stress measure utilized was the Perceived Stress Scale (PSS) [81]; this self-assessed questionnaire measures the perception of stress (degree to which situations in the life of the subject are evaluated as stressful). This is one of the tools most frequently used for evaluating work-related stress. To evaluate the stress response, the GHQ-12 - General Health Questionnaire [82] was chosen: the questionnaire consists of 12 items, it assesses the degree to which a person experiences the presence of stress symptoms. It can signal a situation of distress and in particular depression, anxiety, somatic symptoms and dysfunction at the social level. It can also discriminate between well-being conditions (scores below 5) and the presence of symptoms of psychological distress (scores greater than or equal to 5). Finally, Profile of Mood

States (POMS) [83] was utilized. This questionnaire evaluates six factors, each of which identifies a particular state of mood: tension-anxiety, depression, aggressiveness-anger, vigor-activity, tiredness-indolence, and confusion-bewilderment.

The results of the pilot study on 100 workers attending the treatment program are summarized by the following Tables 2, 3, and 4.

PSS (N=100)	Mean (sd)
before	18.55 (5.089)
after	14.87 (4.923)

Anova: F(1,99) = 63.990, p=.000

**Table 2.** Descriptive statistics for Perceived Stress Scale (PSS). Average score of the sample before and after the treatment.

GHQ (N=100)	Mean (sd)
before	2.55 (2.749)
after	1.01 (1.664)

Anova: F(1,99) = 46.615, p=.000

**Table 3.** Descriptive statistics for General Health Questionnaire Scale (GHQ): Average score of the sample before and after the treatment

POMS-T (N=100)	Mean (sd)
before	11.33 (5.853)
after	6.77 (5.272)

Anova: F(1,99) = 76.112, p=.000

**Table 4.** Descriptive statistics for POMS-Tension and Anxiety Scale: Average score of the sample before and after the treatment.

For the Scale for the Perceived Stress (PPS) there is a significant decrease in the average score of the sample, from 18.55 to 14.87; for General Health Questionnaire (GHQ) there is a significant decrease in the average score of the sample, from 2,55 to 1,01; and for POMS, in particular, in the subscale tension and anxiety, there is also a significant improvement; finally, there is a clear

and significant reduction in the percentage of subjects who experience a condition of distress (from 21% to 8%).

## 5. Conclusion

In the light of the benefits and the effectiveness showed in preventing and treating anxiety symptoms, yoga and meditation protocols would reasonably be helpful if proposed in organizations and to the general public health system. This person-centred approach generates a prevention culture and a significant costs reduction among all three levels of prevention mentioned earlier.

Workplace being a main place of high level and high intensity interactions, the intervention models presented could be positive examples of an institutional response to stress issue. Another positive outcome is the creation of a widespread culture of efficacious prevention of stress responses without the induction of secondary costs due to medication side effects, medication costs, lost days of work (as the traditional approaches induce instead) and with evident benefits on work efficacy and work–life balance. Moreover, these interventions do not generate a stigmatizing response in the whole system, being “not psychiatric” even if deeply rooted in psychic life and equilibrium. Yoga is focused on empowerment and self-efficacy, acting on body level to effect mind–body system, and it promotes a central role of the worker/patient in pursuing health and balance in daily life.

Probably it will be necessary to tailor the interventions to the different settings, target groups, and patients. The experience of programs like Mindfulness Based Stress Reduction Program, the project at Hospital Fatebenefratelli, and the TLEX Program can be examples to follow confirming that when yoga and meditation programs are presented in a proper way and adequately sponsored by an organization’s leaders, not only is the participation of employees and managers assured, but they also show encouraging results.

More work has to be done in this direction to identify the most effective approaches and to differentiate the interventions based on the target population and the nature of the challenges that the context proposes. Yoga is, however, a new low-risk, without side effects, way to improve health and quality of life [84].

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## References

- [1] Engel G. The Need for a New Medical Model: A Challenge for Biomedicine. *Science*; 1977, 196:129-136.
- [2] Engel G. How Much Longer Must Medicine's Science Be Bound by a Seventeenth Century World View? *Psychother Psychosom*. 1992; 57:3-16.
- [3] EU-OSHA European Agency for Safety and Health at Work [internet]; 2014. Available from: <http://osha.europa.eu>; or <https://www.healthy-workplaces.eu/en>
- [4] Ferrari G. Manuale di valutazione dello stress e dei rischi psicosociali [Manual for evaluation of stress and psychosocial risks]. Edizioni Ferrari Sinibaldi, Italy, 2010.
- [5] Selye H. A Syndrome Produced by Different Nocuous Agents. *Nature*, 1936; 138: 32.
- [6] Selye H. History of the Stress Concept. In: Goldberger L and Breznitz S (Eds.), *Handbook of Stress: Theoretical and Clinical Aspects*. 2nd Ed. New York: The Free Press, 1993.
- [7] Selye H. *From Dream to Discovery: On Being a Scientist*. Ayer Co Pub; New edition, 1975.
- [8] Sanavio E, Cornoldi C. *Psicologia Clinica [Clinical Psychology]* Il Mulino, Bologna, Italy, 2001.
- [9] Selye H. *Stress without Distress*. New York: Harper & Row, 1974.
- [10] Holmes T.H, Rahe R.H. The Social Readjustment Rating Scale. *J Psychosom Res*. 1967; 11: 213-218.
- [11] Benson H, Allen RL. How Much Stress is Too Much. *Harvard Business Review*, 1980; 58(5): 86-92. Available from: <https://hbr.org/1980/09/how-much-stress-is-too-much>
- [12] Yerkes RM, Dodson JD. The Relation of Strength of Stimulus to Rapidity of Habit-Formation. *J. Comp. Neurol. Psychol*. 1908; 18: 459-482. doi: 10.1002/cne.920180503.
- [13] Bandura A. *Self-efficacy: The Exercise of Control*. New York: Freeman, 1997.
- [14] Luszczynska A, Scholz U, Swarzer R. The General Self-efficacy Scale: Multicultural Validation Studies. *J Psychol*, 2005; 139(5): 439-457.
- [15] Lazarus RS. *Psychological Stress and the Coping Process*. New York: Mc Graw-Hill, 1966.
- [16] Lazarus RS, Folkman S. *Stress Appraisal and Coping*. New York: Springer, 1984.
- [17] Clarck JV, Arkowitz H. Social Anxiety and Self-evaluation of Interpersonal Performance. *Psychological Reports*, 1975; 36: 211-221.
- [18] Buss AH. *Self Consciousness and Social Anxiety*. San Francisco: Freeman, 1980.



- [19] Villone Betocchi G, Asprea AM. Ansia, Ansia Sociale e Ansia da Esame nella Prospettiva Cognitiva. *Arch psicol Neurol psichiatr.* 1994; LV(1-2): 326-338.
- [20] Bellack M, Hersen AS. (Eds.) *Research and Practice in Social Skills Training.* New York: Plenum Press, 1979.
- [21] Lazarus RS. Coping Theory and Research: Past, Present and Future. *Psychosom Med.* 1993; 55: 234-247.
- [22] Weisman A, Worden JW. *Coping and Vulnerability: A Research Report.* Boston, MA: Massachusetts General Hospital, 1977.
- [23] Folkman S. Positive Psychological States and Coping with Severe Stress. *Soc Sci Med.* 1997; 45(8): 1207-1221.
- [24] Scheirer MF, Carver CS. Optimism, Coping and Health: Assessment and implications of Generalized Outcome Expectancies on Health. *Health Psychology.* 1985; 4(3): 219-247.
- [25] Scheirer IH, Carver CS. Distinguishing Optimism From Neuroticism (and trait Anxiety, self-mastery, and self-esteem): A Reevaluation of the Life Orientation Test. *J Pers Soc Psychol.* 1994; 67(6): 1063-1078.
- [26] Grassi L, Buda P, Cavana L, Annunziata M, Torta R, Varetto A. Styles of Coping with Cancer: The Italian version of the MINI-MAC Scale. *Psycho-Oncol.* 2005; 14: 115-124.
- [27] Schou I, Ekberg O, Ruland CM. The Mediating Role of Appraisal and Coping in the Relationship between Optimism-Pessimism and Quality of Life. *Psycho-Oncol.* 2005; 14: 718-727.
- [28] Druss RG, Douglas CJ. Adaptive Responses to Illness and Disability. *Healthy Denial. Gen Hosp Psychiat.* 1988; 10: 163-168.
- [29] Wittchen HU, Jacobi F. Size and Burden of Mental Disorders in Europe: A Critical Review and Appraisal of 27 Studies. *Eur. Neuropsychopharmacol.* 2005; 15: 357-367.
- [30] Balasubramaniam M, Telles S, Doraiswamy M. Yoga on Our Minds: A Systematic Review of Yoga for Neuropsychiatric Disorders. 2012; 3: 117.
- [31] Da Silva TL, Ravindran LN, Ravindran AV. Yoga in the Treatment of Mood and Anxiety Disorders: A Review. *Asian J Psychiat.* 2009; 2(1): 6-16.
- [32] Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al. Prevalence of Mental Disorders in Europe: Results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. *Acta Psychiat Scand.* 2004; 109(420): 21-27.
- [33] Cassano P, Fava M. Depression and Public Health: An Overview. *J Psychosom Res.* 2002; 53: 849-857.
- [34] Wittchen HU, Lieb R, Schuster P, Oldehinkel AJ. When Is Onset? Investigations into Early Developmental Stages of Anxiety and Depressive Disorders. In: Rapaport JL

(Ed.), *Childhood Onset of "adult" Psychopathology*, Clinical and Research Advances. American Psychiatric Press, Washington, pp 259–302, 1999.

- [35] Wittchen HU, Kessler RC, Beesdo K, Krause P, Höfler M, Hoyer J. Generalized Anxiety and Depression in Primary Care: Prevalence, Recognition and Management. *J Clin Psychiatry*. 2002; 63 Suppl 8: 24-34.
- [36] Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jönsson B. et al. The Size and Burden of Mental Disorders and Other Disorders of the Brain in Europe. *Eur Neuropsychopharmacol*. 2010; 121(9): 655–679.
- [37] Wittchen HU. Generalized Anxiety Disorder: Prevalence Burden and Cost to Society. *Depress Anxiety*. 2002; 16(4): 162-171.
- [38] Michelini S, Cassano GB, Frare F, Perugi G. Long-term Use of Benzodiazepines: Tolerance, Dependence and Clinical Problems in Anxiety and Mood Disorders. *Pharmacopsychiatry*. 1996; 29: 127-134.
- [39] Rickels K, Downing R, Schweizer E, Hassman H. Antidepressants for the Treatment of Generalized Anxiety Disorder. A Placebo-controlled Comparison of Imipramine, Trazodone, and Diazepam. *Arch Gen Psychiatry*. 1993; 50: 884-895.
- [40] Gelenberg AJ, Lydiard RB, Rudolph RL, Aguiar L, Haskins JT, Salinas E. Efficacy of Venlafaxine Extended-release Capsules in Non-depressed Outpatients with Generalized Anxiety Disorder: A 6-month Randomized Controlled Trial. *JAMA*. 2000; 283: 3082-3088.
- [41] Pollack MH, Zaninelli R, Goddard A, McCafferty JP, Bellew KM, Burnham DB, et al. Paroxetine in the Treatment of Generalized Anxiety Disorder: Results of a Placebo-Controlled, Flexible-Dosage Trial. *J Clin Psychiatry*. 2001; 62: 350-357.
- [42] Baldwin DS, Nair RV. Escitalopram in the Treatment of Generalized Anxiety Disorder. *Expert Rev Neurother*. 2005; 5: 443-449.
- [43] Katzman MA, Vermani M, Jacobs L, Marcus M, Kong B, Lessard S, et al. Quetiapine as an Adjunctive Pharmacotherapy for the Treatment of Non-remitting Generalized Anxiety Disorder: A Flexible-Dose, Open-label Pilot Trial. *J Anxiety Disord*. 2008; 22: 1480-1486.
- [44] Andrews G, Slade TC, Issakidis SC. Deconstructing Current Comorbidity: Data from the Australian National Survey of Mental Health and Well-being. *Br J Psychiat*. 2002; 181(4): 306-314.
- [45] Bonura KB. *The Impact of Yoga on Psychological Health in Older Adults*. Florida State University. Electronic Theses, Treatises and Dissertations. Paper 3549, 2007. Available from: <http://diginole.lib.fsu.edu/cgi/viewcontent.cgi?article=2537&context=etd>

- [46] Clance P, Mitchel M, Engelman S. Body Cathexis in Children as a Function of Awareness Training and Yoga. *J Clin Child Psychol.* 1980; 9: 82-85.
- [47] Nicolis G, Prigogine I. *Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order through Fluctuations.* NY: Wiley, 1977.
- [48] Woods JH. *The Yoga-System of Patañjali.* Cambridge, MA: Harvard University Press, 1914.
- [49] Brown RP, Gerbarg PL. Sudarshan Kriya Yogic Breathing in the Treatment of Stress, Anxiety, and Depression. Part II-Clinical Applications and Guidelines. *J Altern Complement Med.* 2005; 11(4): 711-717.
- [50] Ravindran AV, Lam RW, Filteau MJ, Lespérance F, Kennedy SH, Parikh SV, Patten SB. Canadian Network for Mood and Anxiety Treatments (CANMAT) Clinical Guidelines for the Management of Major Depressive Disorder in Adults. V. Complementary and Alternative Medicine Treatments. 1. *J Affect Disord.* 2009; 117 Suppl 1: S54-64.
- [51] Michalsen A. Die Komplementärmedizin und der «menschliche Faktor». *Forsch Komplementmedizin Innere Medizin V und Integrative Medizin, Kliniken Essen-Mitte, Deutschland* 2006; 13(2): 68-69.
- [52] Agte VV, Chiplonkar SA. Sudarshan Kriya Yoga for Improving Antioxidant Status and Reducing Anxiety in Adults. *Alternative and Complementary Therapies,* 2008, 14(2): 96-100. Available from: <http://online.liebertpub.com/doi/pdfplus/10.1089/act.2008.14204>
- [53] Meti BL, Desiraju T. Study of Changes in BEG and Autonomic Parameters After 4 Months of Initiation and Practice of Pranayama. *Indian J Physiol Pharmacol.* 1984; 28: 34.
- [54] Meti BL, Raju TR. Auditory Middle Latency Evoked Potentials in Kriya Yoga. *Health Administrator.* 1993; 4: 56-58.
- [55] Iyengar BKS. *Light on Pranayama: The Yogic Art of Breathing.* New York: Crossroads Publishing, 1997.
- [56] Sarris J, Byrne GJ. A Systematic Review of Insomnia and Complementary Medicine Sleep Medicine Reviews. 2011April; 15(2): 99–106.
- [57] Gilbert C. *Yoga and Breathing Journal of Bodywork and Movement Therapies,* Elsevier, 1999.
- [58] Gupta N, Khera S, Vempati RP, Sharma R, Bijlani RL. Effect of Yoga Based Lifestyle Intervention on State and Trait Anxiety. *Indian J Physiol Pharmacol.* 2006; 50(1): 41-47.

- [59] Brown RP, Gerbarg PL. Sudarshan Kriya Yogic Breathing in the Treatment of Stress, Anxiety, and Depression. Part II-Clinical Applications and Guidelines. *J. Altern. Complement. Med.* 2005b ;11(4): 711-717.
- [60] Zope SA, Zope RA. Sudarshan Kriya Yoga: Breathing for Health. *Int J Yoga.* 2013; 6(1): 4-10.
- [61] Naga Venkatesha Murthy PJ, Janakiramaiah N, Gangadhar BN, Subbakrishna DK. P300 Amplitude and Antidepressant Response to Sudarshan Kriya Yoga (SKY). *J Affect Disorders.* 1998; 50(1): 45-48.
- [62] Janakiramaiah N, Gangadhar BN, Naga Venkatesha Murthy PJ, Harish MG, Subbakrishna DK, Vedamurthachar A. Therapeutic Efficacy of Sudarshan Kriya Yoga (SKY) in Dysthymic Disorder. *NIMHANS J.* 1998; 17: 21–28.
- [63] Janakiramaiah N, Gangadhar BN, Naga Venkatesha Murthy PJ, Harish MG, Subbakrishna DK, Vedamurthachar A. Antidepressant Efficacy of Sudarshan Kriya Yoga (SKY) in Melancholia: A Randomized Comparison with Electroconvulsive Therapy (ECT) and Imipramine. *J Affect Disord.* 2000; 57: 255–259.
- [64] Rohini V, Pandey RS, Janakiramaiah N, Gangadhar BN, Vedamurthachar A. Comparative Study of Full and Partial Sudarshana Kriya Yoga (SKY) in Major Depressive Disorder. *NIMHANS J.* 2000; 18(1-2): 53-57.
- [65] Vedamurthachar A, Janakiramaiah N, Hegde JM, Shetty TK, Subbakrishna DK, Sureshbabu SV, Gangadhar BN. Antidepressant Efficacy and Hormonal Effects of Sudarshana Kriya Yoga (SKY) in Alcohol Dependent Individuals. *J Affect Disorders.* 2006; 94(1-3): 249-253.
- [66] Gangadhar BN, Janakiramaiah N, Sudarshan B, Shety KT. Stress-Related Biochemical Effects of Sudarshan Kriya Yoga in Depressed Patients Study #6. Presented at the Conference on Biological Psychiatry. New York: UN NGO Mental Health Committee, 2000.
- [67] European Commission's Directorate General [internet]; 2014. Available from: [http://www.insead.edu/media\\_relations/press\\_release/docs/RESPONSE-Executive-Briefing.pdf](http://www.insead.edu/media_relations/press_release/docs/RESPONSE-Executive-Briefing.pdf)
- [68] Bazarko D, Rebecca AC, Azocar F, Jo Kreitzer M. The Impact of an Innovative Mindfulness-Based Stress Reduction Program on the Health and Well-Being of Nurses Employed in a Corporate Setting. *J Workplace Behav Health.* 2013; 28(2):107-133.
- [69] University of Massachusetts Medical School; 2014. Available from: <http://www.umassmed.edu/cfm/stress-reduction/workplace-programs/>
- [70] Awareness and Relaxation Training (ART); 2014. Available from: <http://www.mindfulnessprograms.com/corporate-program.php>

- [71] Sri Sri Ravi Shankar, [internet]; 2014. Available from: <http://srisriravishankar.org/entry/tlex-transformational-leadership-for-excellence/>
- [72] Sri Sri Ravi Shankar; [internet]; 2014. Available from: [www.tlexinstitute.com](http://www.tlexinstitute.com)
- [73] Doria S, Sanlorenzo R, Irtelli F, Mencacci C. Anti-anxiety Efficacy of Sudarshan Kriya Yoga in General Anxiety Disorder: A multicomponent, Yoga Based, Breath Intervention Program for Patients Suffering from Generalized Anxiety Disorder with or without Comorbidities. *J Affect Disorders* (2015 in press).
- [74] American Psychiatric Association, 1994. *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. American Psychiatric Association, Washington, DC.
- [75] Yoga Research Group. *Treating Depression with Sudarshan Kriya Yoga: A Demonstration Video Cassette*. Department of Health Education, National Institute of Mental Health and Neurosciences, Bangalore (1995).
- [76] Hamilton M. The Assessment of Anxiety States by Rating. *Br J Med Psychol*. 1959; 32(1): 50–55.
- [77] Zung WWK. A Rating Instrument for Anxiety Disorders. *Psychosomatics*. 1971; 12(6): 371–379.
- [78] Hamilton M. A Rating Scale for Depression. *J Neurol Neurosurg Psychiatry*. 1960; 23: 56–62.
- [79] Zung WWK. A Self-Rating Depression Scale. *Arch Gen Psychiatry*. 1965; 12(1): 63-70.
- [80] Derogatis LR: *SCL-90-R, Administration, Scoring and Procedures Manual-II for the R(evised) Version and Other Instruments of the Psychopathology Rating Scale Series*. Townson: Clinical Psychometric Research; 1992 [italian version: Emanuele Preti, Antonio Prunas, Irene Sarno e Fabio Madeddu, OS Editions, Florence, Italy, 2011.
- [81] Cohen S, Kamarck T, Mermelstein R. A Global Measure of Perceived Stress, *J Health Soc Behavior*. 1983; 24: 385-396.
- [82] Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, Rutter C. The Validity of Two Versions of the GHQ in the WHO Study of Mental Illness in General Health Care *Psychol Med*. 1997; 27(1):191-197.
- [83] Spielberger CD. Review of Profile of Mood States. *Professional Psychol*. 1972; 3(4): 387-388.
- [84] Balasubramaniam M, Telles S, Doraiswamy PM. Yoga on Our Minds: A Systematic Review of Yoga for Neuropsychiatric Disorders. *Front Psychiatry*. 2013; 25(3): 117(1-16). Available from: <http://journal.frontiersin.org/Journal/10.3389/fpsy.2012.00117/full>