

Yoga Therapy and Its Effects on Stress

In the context of an urban white collar lifestyle

Research project in the course of the Yoga Therapy Training, India Batch 2012-14
by Gabi Baumgartner, February 2016

ABSTRACT

A 3-month intervention with a personalized daily yoga practice for office workers, who show symptoms of stress, shows that yoga therapy does open new perspectives to its practitioners.

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Introduction

What I am setting out to do is simple enough. I am trying to find out: Can a personalized daily yoga practice reduce chronic stress among urban office workers. Living in an urban environment in a city where most people have a desk job I notice that my yoga students not only suffer from lack of exercise but many of them display typical symptoms of stress. The minor symptoms of which are: constant state of rush, inability to listen or taking in information, inability to relax, which shows in irritability, in restlessness as well as body tensions. The more serious symptoms resulting from a longer period of stress are digestive disorders, sleep disorders, headaches or migraines, muscle tensions which in turn result in chronic pain and more serious diseases. Chronic stress impacts the physical, psychological, emotional and social well-being of a person. Because stress is not a disease as such, not many treat it at an early stage, instead cover symptoms with self-medication, or are lead to believe that these symptoms are a 'normal' part of urban lifestyle. But often stress is the first step into dis-ease.

I am not the first one to look into this. Aetna, an American company, together with Duke University School of Medicine, found that one hour of yoga practice a week decreased stress levels in employees by a third.¹ Their study was based on a weekly group yoga practice and was not an individual yoga therapy class. Why I am setting out to find out for myself is because the more I study this topic the more I see that in this urban environment I live in most people are affected by stress, including myself! And so I see the potential of an individualized yoga therapy practice to effectively reduce the suffering of stress. Studies on stress conducted in Colombia and in Hong Kong in 2013 among care givers such as teachers and health care providers, who have shown to be the first ones to suffer serious stress symptoms, show that mindfulness-based interventions show positive effects within as little as four weeks.² Hong Kong is a capitalist system very much influenced by western societies and in terms of working ethics tends to have even longer working hours and higher pressure on work performance. Neither law nor tradition or customs are in place to prevent this. The list of top diseases in this city show that diseases such as heart disease, hypertension, diabetes, anxiety, and depression that are linked to stress are on the top. At the same time yoga has become popular in this city as a way of keeping fit. Active professionals will be interested to know that yoga practiced as therapy has the potential to heal them in a more holistic and profound way. The time is ripe to promote yoga among employers and employees not only as a way to keep fit but also as a healing modality.

1 Wolever RQ et al., 2012, Effective and viable mind-body stress reduction in the workplace: a randomized controlled trial. *J Occup Health Psychol.* 2012 Apr;17(2):246-58. doi:10.1037/a0027278. Epub 2012 Feb 20. PubMed PMID: 22352291.

2 Manuel Manotas et al, 2013 (Colombia), Association of Brief Mindfulness Training With Reductions in Perceived Stress and Distress in Colombian Health Care Professionals. *International Journal of Stress Management*, 2014 Vol. 21 No 2, 207-225. Oi Ling Siu et al, 2013 (Lingnan University of Hong Kong) Intervention Studies on Enhancing Work Well-Being, Reducing Burnout, and Improving Recovery Experiences Among Hong Kong Health Care Workers and Teachers. Published in the *International Journal of Stress Management* 2014, Vol 21, No 1, 69-84

What is Stress

In a Nutshell

Stress is the impact of, as well as the reaction to, an extraordinary situation or condition that hits an organism and brings it out of balance, or in biological terms, out of homeostasis. In reaction to this the organism mobilizes extraordinary forces to keep on its feet (sometimes literally) or keep up its homeostasis, despite the impact. These extraordinary forces are a temporary measure and cannot be upheld for long as they are drawing too much energy out of the organism, a prolonged stress situation therefore will result in depletion of the organism, in a state very much out of balance. This state is what is called chronic stress or psychological distress and makes the living system very vulnerable to developing other diseases.

Stress is triggered by a stressor, which is an uninvited disturbance to the body or its senses from within or from outside. It is important to note that what may be a stressor to one may not be a stressor to another. Whether a potential stressor becomes a stress trigger depends on previous physical and/or emotional experience of the organism. It's the same law in physics. If the tower has already a crack it may collapse with a slight additional tremor.

The General Adaption Syndrome (GAS)

Hans Selye³ one of the first scientists to use the term outside of physics, describes three phases of stress and calls them "The General Adaption Syndrome" (GAS):

Hans Selye shows the progression curve from when the sympathetic nervous system kicks in (phase one) to the high performance of resistance during which the body copes and adapts to the changed environment (phase 2) to the exhaustion stage (phase 3) which sets in after the crisis is over or after a prolonged duration of coping.

Acute Stress to Chronic Stress

The book "The Stress Solution"⁴ names three types of stress: Acute stress, episodic acute stress and chronic stress.

Acute stress is short and easily manageable; episodic acute stress is repeated episodes of acute stress so much so that it becomes a habit or lifestyle, typically personal nature and lifestyle issues are experienced as being one and the same (i.e. "I am an impatient person"). Episodic stress, they say, is best treated with professional help over several months. Chronic stress however is caused by long-term attrition, typically by hostile living conditions like dysfunctional families, poverty, political unrest, war, mistreatment or a traumatic experience early in life that influenced the person's perception

3 Putting Stress in Life: Hans Selye and the Making of Stress Theory Social Studies of Science June 1999 29: 391-410, <http://sss.sagepub.com/content/29/3/391>

4 The Stress Solution: An Action Plan to Manage the Stress in Your Life Pocket Books (Mar. 1993) English ISBN-10: 0671753193 by Lyle H., Ph.D. Miller (Author), Alma Dell, Ph.D. Smith (Author), Larry Rothstein (Author)

profoundly. Chronic stress is not easy to treat, as it requires the person to actively self-examine their personality and belief-system, best with professional guidance.

The Sense of Coherence Framework (SOC)

One scholar who spent his whole professional life researching the relationship between stress and wellbeing and between stress and health was Aaron Antonovsky (1923 – 1994). He did not get tired of looking at it from different angles, and was there at the height of psychoanalysis in the 70s and 80s. In the 90s he criticized that “we are held back by the concept [of psychosomatic disease], because it implies that some diseases are psychosomatic and some are not.” He went on to state “it prevents us from seeing that all human distress is always that of an integrated organism, [and it] always has a psychic, social and somatic aspect.” He warned from perceiving the living systems (including the human) as a static system; rather he preferred to see each of us, at any given time, constantly in change. Antonovsky’s theory “The Sense of Coherence Framework” (SOC) is based on his belief that we all have “generalized resistance resources” (GRR), which let us successfully cope with the inherent stressors of human existence.

He set out to find out, what all the GRR’s have in common, why they seemed to work. What he found was that they all fostered repeated life experiences, which helped a person to see the world as ‘making sense’ - cognitively, practically and emotionally. Or in an image: “The stimuli bombarding one from the inner and outer environments are perceived as information rather than as noise”. The SOC Framework sees the world on a continuum and as comprehensible, manageable and meaningful. Confronted with a stressor, a person with a strong SOC will a) wish to and be motivated to cope (meaning), b) believe that the challenge is understood (comprehensibility), and c) believe that resources to cope are available (manageability). Antonovsky makes clear that one cannot *decide* to have a strong SOC, the SOC is shaped by life experiences such as consistency, underload-overload balance, and participation in socially valued decision making. On the bases of his findings, his question is: What can be done to strengthen the sense of comprehensibility, manageability, and meaningfulness?⁵ One large study working with SOC found that older age groups had significantly higher SOC than the younger age group. Whether one acquires a stronger SOC during life or whether the younger generation’s environment gave them less opportunity to acquire a stronger SOC can not be defined, also the question whether a chronic illness weakens the SOC or whether someone with a weak SOC is more prone to illness cannot be determined if tested at the same time.

Studies show that a strong SOC does go together with good health. We can thus assume that the three components making up the SOC are strongly linked with good health, but he as a scientist could not answer his question “What can be done to strengthen the sense of comprehensibility, manageability, and meaningfulness?”

⁵ The salutogenic model as a theory to guide health promotion. By Aaron Antonovsky. Published by Health Promotion International, Oxford University Press 1996, Vol. 11, No 1

What the work of Antonovsky shows is that stress has to be looked at in a holistic way, including all aspects of a person. The reason he did not find a scientific answer to his quest, may be because each person has an individual answer to what strengthens his or her sense of comprehensibility, manageability, and meaningfulness.

Impact of Stress on Body Systems

When our mind perceives threat, such as a sudden scare, time pressure, work pressure, etc., the body reacts with a set of involuntary changes preset in our system. The trigger of a threat triggers production of the hormone Adrenalin and activates the sympathetic nervous system (SNS). This is known as the “fight or flight response”. The muscle tonus raises (muscles tense up), the heart rate goes up, the breathing rate increases, as does the sugar (glucose) level in the blood, the pupils dilate, the blood vessels in the periphery constrict (to save blood supply for the larger muscles) and another hormone, Cortisone, gets released to increase endurance and adaptation. However, to save energy during the crisis, the digestive system pauses and less blood circulates to the internal organs and out to the extremities of the limbs. All this is to cope during an emergency. After the emergency is over, the body functions return to a relaxed state and the parasympathetic nervous system (PNS) takes over, so that the body can go back to normal functioning. However, if the stressor persists, it becomes necessary to attempt some means of coping with the stress. The body cannot keep up in the emergency state indefinitely; if the crisis goes on until all resources are depleted, the body will not return to normal function but instead go into exhaustion (see 3 phases described above). **Exhaustion** is the alternative third stage in the GAS model. At this point, the body's resources are depleted and the body is unable to maintain even normal function. The initial symptoms may reappear (sweating, raised heart rate, etc.). If stage three is extended, long-term damage may result, such as local anemia and cell dysfunction (resulting from prolonged vasoconstriction), prolonged high levels of cortisone will compromise the body's immune system⁶, and bodily functions become impaired. The result can manifest itself in obvious illnesses, such as digestive disorder (bleeding, ulcers, IBS, constipation), diabetes, irregular menstruation, cardiovascular issues, along with mental illnesses such as depression and anxiety.

Physical symptoms of stress can include:

Rapid heart beat, headache, body aches, tight muscles, neck or jaw pain, grinding teeth, insomnia, lack of energy, tiredness, high blood pressure, stomach or digestive problems, skin rashes, hormonal imbalances, rapid increase or decrease in appetite, sexual dysfunction, sweating.

Mental, emotional and behavioral symptoms of stress can include:

Anxiety, depression, moodiness, extreme anger, irrational fears, repetitive behaviors, forgetfulness, difficulty concentrating, hyperactivity, irritability, restlessness, obsession

⁶ Raison et al., 2003, When not enough is too much: the role of insufficient glucocorticoid signaling in the pathophysiology of stress-related disorders. *Am J Psychiatry*. 2003;160:1554–1565. [PubMed]

over things, being overly emotional, nightmares, increased difficulties in relationships.

Long-term and untreated stress can lead to the development of stress related conditions such as depression, anxiety, eating disorders, stomach ulcers, irritable bowel syndrome, migraine, hyper tension, cardiac problems, vascular disease, diabetes, hormonal problems, osteoporosis, hair loss, aging skin, cancer, neurodegenerative conditions⁷, and immune inflammatory pathways.

Different studies focus on various stressors and different mechanisms of coping. What seems to be common to all circumstances is that it isn't only the nature or force of a stressor, but also the "attitude" towards it and how the stressor is perceived that determines how much one is affected. Antonovsky's theory seems to support this. Hence our mental state⁸ is crucial as to how much we get affected (physically and mentally) by stressors. It seems that, even in a case of physical illness, which makes the organism more susceptible to a stressor, the state of mind will have a great influence of just how much the organism as a whole gets impacted.

Perception of stressor is key, shown in how Prentiss Price Ph.D. defines today's stress as "our mental, emotional, behavioral or physical reaction to any perceived demands or threats."

Further she summarizes, that essentially, humans stress out for two reasons:

- Firstly, because we perceive a situation as dangerous, difficult, or painful,
- And secondly, we do not believe that we have the resources to cope.⁹

The Spiritual Dimension

Aaron Antonovsky's Sense of Coherence Framework includes 3 aspects, one of them being a spiritual one: The meaningfulness of a situation, and the motivation to see through it, especially in case of suffering, requires spiritual resources and hope.

Anselm Gruen, a monk of the Benedictine order, counsels people suffering of stress at the work place. He writes: "Whether or not our work (place) stresses us out, is in its core, a spiritual issue. Those wanting to prove themselves through their work, wanting to look good in front of themselves and others, are drawing on their resources. Which will be depleted soon. However, those who found the source within, the source of the holy spirit [the life force], for those, work will flow from within. Those in the "flow" can

7 Evans et al., 1999, Depression in the medical setting: biopsychological interactions and treatment considerations. J Clin Psychiatry. 1999;60 4:40-55

8 Term Definition: Mind (by the Oxford Dictionary) 1. The element of a person that enables them to be aware of the world and their experiences, to think, and to feel; the faculty of consciousness and thought. 2. A person's ability to think and reason; the intellect.

Term Definition: Mental Health (by WHO): Mental health is defined as a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.

9 Workshop booklet developed by Prentiss Price, Ph.D , May 2005, produced by The Lupus Support Network <http://www.thelupussupportnetwork.org/files/stress1.pdf>

work a lot without getting tired. It shows in the way someone works, whether hard work is motivated by a spiritual attitude or by the egoistic aim to increase self-worth, out of lack of self-respect.”¹⁰

Factors Found to Reduce Stress in Work Situation

A study by Kahn and Byosiere¹¹ distilled factors which reduce stress in a work situation, the major ones being:

- Support by co-workers,
- Enough time to work on assignments,
- Trust from the boss, and
- Personal space.

Personal space might be at a different level in Asia, but all the other factors I believe will be true for Asian office workers as well. The key triggers of stress in the office environment according to this study are:

1. Lack of respect and support in human relationships, and
2. Time pressure

Common Therapies to Treat Stress

Manage

Meditation and Mindfulness programs, retreats and lessons have become popular in the US and Europe over the last fifteen years to lower stress levels among the white-collar work force. There are a number of managers and CEO's who have taken on regular meditation or mindfulness practices.

Mindfulness

Mindfulness has become the leading name for a combination of techniques tried and tested in traditional eastern disciplines and practiced in Buddhism, Yoga, Tai Chi and Chi Gong; mixed with western neuroscience and psychological insights. It includes experiences in mindful walking, sitting, eating, yoga/mindful movement, and group discussion. One scholar behind this movement is Jon Kabat-Zinn. He developed 'Mindfulness Based Stress Reduction', called MBSR.¹²

Meditation

Research into the phenomenon of neuroplasticity show that meditation (in this case on compassion) increases activity in the left prefrontal cortex, which is linked to the

10 Anselm Gruen, *Buch der Lebenskunst*, Herder 2002, p.73, ISBN 3451279975

11 Kahn, R.L. and Byosiere, P.B. (1992). *Stress in organizations*. In M.D. Dunnette and L.M Hugh (eds.). *Handbook of Industrial and Organizational Psychology*. (pp.571-650). Palo Alto, CA: Consulting Psychologists Press

12 Jon Kabat-Zinn, PhD, is founding Executive Director of the Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School. He is also the founding director of its renowned Stress Reduction Clinic and Professor of Medicine emeritus at the University of Massachusetts Medical School. He teaches mindfulness and Mindfulness-Based Stress Reduction (MBSR) in various venues around the world. He received his Ph.D. in molecular biology from MIT in 1971 in the laboratory of Nobel Laureate, Salvador Luria.

capacity for happiness¹³.

Benefit of meditation practice on stress related neurobiological and behavioral responses. Studies found that cortisol levels could be lowered drastically during meditation, but not in times of non-meditation or in between meditation.

Nevertheless, immunity was shown as higher in people with a regular meditation practice¹⁴.

Loving-kindness practice (Theravada Buddhist Tradition) have been shown to increase self-compassion, which in turn has been associated with reduction in perceived stress, burnout, depression and anxiety as well as increases in life satisfaction¹⁵.

Interesting in the context of this thesis is a study by Lutz¹⁶, which suggests that even brief exposure to compassion meditation training may affect activity in stress-relevant brain areas as well.

Yoga

Regular group yoga classes give practitioners time and space to consciously attend to themselves. The mind can focus on following only one thing at a time. Classes are designed to give a moderate stretch, workout and relaxation to all muscles. The connection of body, breath and movement give a sense of calmness and peace.¹⁷

Relaxation

There are various methods to relax body and mind: breathing practice, deep relaxation techniques, nidra yoga, walking, going into nature, creating art, etc

Exercise

Physical activity is known to increase the production of feel-good endorphins (neurotransmitters to the brain) whose effect helps treating mild depression and anxiety¹⁸. Long-term moderate exercise has shown to accelerate recovery of stress-evoked cardiovascular issues, as it reduces resting blood pressure (BP), the heart rate (HR) and the sympathetic activity of the nervous system, and alters neurons in a way that supports recovery¹⁹.

Psychotherapy

Counseling sessions with a psychologist help identify behavior patterns and situations

13 Alterations in brain and immune system function produced by mindfulness meditation. Davidson RJ, *Psychosom Med.* 2004 Jan-Feb;66(1):148-52

14 Effect of Compassion Meditation on Neuroendocrine, Innate Immune and Behavioral Responses to Psychosocial Stress, Thaddeus W.W. Pace et al. 2009, *Psychoneuroendocrinology.* 2009 Jan; 34(1): 87-98

15 Shapiro et al., 2005, Mindfulness-based stress reduction for health care professionals: results from a randomized trial. *Int J Stress Manage.* 2005;12:164-176

16 Lutz et al., 2008, Long-term meditators self-induce high-amplitude gamma synchrony during mental practice. *Proc Natl Acad Sci USA.* 2004;101:16369-16373.

17 Wolever RQ et al., 2012, Effective and viable mind-body stress reduction in the workplace: a randomized controlled trial. *J Occup Health Psychol.* 2012 Apr;17(2):246-58. doi:10.1037/a0027278. Epub 2012 Feb 20. PubMed PMID: 22352291.

18 Fox, K.R. (1999). "The influence of physical activity on mental well-being." *Public Health Nutrition*, Vol. 2, pp. 411-418.

19 Long-term moderate exercise accelerates the recovery of stress-evoked cardiovascular responses.

Hsu YC et al., <http://www.ncbi.nlm.nih.gov/pubmed/26473638>

that are contributing to high stress levels. These insights help change perspective, develop coping strategies, such as journaling, managing time effectively, etc.

Workplace Stress reduction Programs

These work with a combination of the above. Currently schools and firms are becoming more aware of the need to address the issue of stress and implement programs such as counseling and the MBSR to equip staff and students with coping techniques.

What all therapies have in common is the building up of awareness. Developing the skill to observe our own pattern in thoughts, actions and habits.

Medication

In some cases medication might be needed along with a therapy.

How will Yoga Therapy add to the above?

Yoga practice works on all levels simultaneously. In contrast to traditional psychotherapy or workplace stress-reduction programs that emphasize discussion or intellectual analysis, one has to **practice** it.

The practice is taught and guided by the therapist in class, at home the practitioner practices independently.

The many tools of yoga therapy (Asana, Pranayama, Dhyana, Nyasa, chanting, lifestyle counseling) reach the person on different levels. All, or a few of them combined, make up a personal practice, based on the person's ability and state.

The therapy process goes through the stages of reducing symptoms by creating and refining awareness and it uses that awareness to increase the practitioner's capacity to recognize the source of the issue. In the context of stress this would mean the capacity to recognize and then replace damaging habitual patterns with more conscious and skillful responses on the physical, mental and emotional level.

Changing behavioral patterns is challenging. Approaching the issue holistically, including reaching the emotions on the physical level, will make unconscious patterns more accessible. At the same time, yoga practice fosters the experience of feelings like trust, stability, relaxation and ease. An individualized Yoga therapy (as opposed to a group class) is more effective in guiding practitioners into awareness and observation of their own pattern and lifestyle, not in a sense of self-centeredness but in a sense of self-awareness of behavior and mind-body relationship. } bias

Methodology of Study

The method of this study is qualitative, not quantitative, though there will be a comparative discussion as to how the different participants progressed. After an initial overview, a closer look at individual participants will be provided, especially when it comes to their own reflections on the practice.

Outcomes of interest will include the stress level, emotional functioning and person's overall impression of change.

The findings from this study shall help to promote yoga as a therapeutic treatment for stress-related suffering of acute or chronic nature in the setting of working professionals in Hong Kong.

The Participants

To find out what a yoga practice can do to wellbeing in general and stress levels of urban office workers in particular I was looking for people with no or little yoga experience to join this 3-month study. My observation of people around me was that particularly those with combined professional and family responsibility displayed stress symptoms, hence I was fishing in this category.

The criteria for participation was: Middle-aged, white collar, urban lifestyle, sedentary occupation for more than 3 years, and displaying symptoms of stress (i.e. feeling overwhelmed by work, feeling of never having enough time, sleep disorder, digestive problems, high BP, headache, muscle pain etc) and (importantly!) an interested towards yoga practice.

The participants would get a class every 7-14 days and are taught a personalized yoga practice starting at the first meeting. The participants would be asked to practice the given yoga course daily. The duration of the course would be between 20-30 minutes. The course would be verified and adjusted by the teacher in every class.

It seemed easy at first to get people interested in joining - yoga is popular in Hong Kong and taking classes for free seemed very attractive; however, once potential participants learned that they needed to commit to a daily practice and realized that the work is on their side, many declined. Many felt they did not have the time: already having a feeling of not enough time to cope with ones scores and being asked to spend half an hour daily to make them feel better, seemed like a contradiction... !

Finally I got myself 10 participants. My goal at first was 20 participants and a control group to do a quantitative study at first. But I quickly realized that because I was not attached to an institution that would supply me with participants, to have 20 participants plus a control group was not realistic for me. I started out with the 10 participants and took it from there. I timed the start of the study to begin after Chinese New Year (February), when everything starts afresh, and continued through to summer (June), when the heat changes schedules and patterns again. Hence it could last 3-4 months. Within three months it would become apparent whether or not a participant is responding, and in what way. It also seemed the maximum duration to ask for people's commitment, especially for something they haven't experienced before.

Total Participants enrolled in study: 10 participants

Fulfilled all criteria: 9 out of 10 participants

Withdrew over time: 3 out of 9 participants

Completed 3-month survey: 6 participants

Table Showing Sample Profile and clinical status

	Among those enrolled	Among those completed
Age of participants	28 - 54	37 - 52
Total no of participants	10	6
Male	3	3
Female	7	3
More than 8 hours seated per day	5	5
Sedentary job for more than 10 years	5	5
Previous yoga experience	3	1
Tested above average stress levels at beginning of study (according to Q1)	10	6
Tested very high stress levels at beginning of study (according to Q1)	4	3
Suffered shoulder tension (acc. to Q1)	7	4
Suffered aches and pain (acc. to Q1)	9	6
Sleep disorder (acc. to Q1)	4	3
Hypertension (acc. to Q1)	2	2
Digestive disorder (acc. to Q1)	2	1
Migraine (acc. to Q1)	2	0
Anxiety and depression (acc. to Q1)	1	0

The Questionnaires

To measure stress levels, participants fill in a questionnaire at the beginning and every month (after 2-4 classes) thereafter, with questions to reflect back on the past month. The questionnaire consisted of 4 parts (for the first 3 times); and of 5 parts for the 4th and final questionnaire:

Part 1 – Personal information, demographics and typical working hours/posture.

Part 2 – Standardized stress test focusing on work pressure and behavior²⁰

Part 3 – Standardized stress test focusing on perceived stress (feelings)²¹

Part 4 – Self-assessment of physical health, including aches and pain, digestion, and sleep; with space for elaboration where needed.

Part 5 – Reflection of changes since starting with the yoga practice. Open questions.

The ISMA stress test of part 2 was the core of the questionnaire to establish their current stress level. This test was chosen as it observes everyday situations of a working professional and thus suited my target audience. The score of these questions would be my main measurement barometer.

Another standardized stress test developed by Cohen, was added in part 3 to reflect and supplement the former. Cohen's test measures perceived stress and has been used for a variety of studies measuring the impact of mindfulness on stress. This allows a comparison with studies on mindfulness.

To keep the answers as uninfluenced as possible, I have purposely not told the participants that the study's key point was stress, and have also avoided wording that emphasized on stress to introduce the questionnaire; I only told them that the questionnaire would help measure changes and progress of their general wellbeing throughout the study.

This was used as a diagnostic tool, to screen the participant for stress level.

Timeframe

Overall for each participant: 3 months (ended up to be 14 weeks for most)

Timeframe of study including all participants: February 11, 2015 to July 17, 2015

The classes were taught individually (one on one).

Classes with Yoga Therapist during the 3 months: every 7 – 14 days, i.e. minimum 6 classes, maximum 12 classes within the study period.

Questionnaires Interval:

Q1 – at start of study

Q2 – after 1 month

Q3 – after 2 months

Q4 – after 3 months

X This usually comes as a research process flow chart.

20 ISMA Stress Questionnaire by the International Stress Management Association UK, see sample in appendix 1

21 Perceived Stress Scale by Sheldon Cohen, see sample in appendix 2

Content of Yoga Therapy Intervention

A typical course consists of breathing practice and physical poses combined with mental focus, sometimes supported by hand movements or sounds. Rest and sitting still are also part of the course.

Breathing practice (Pranayama) is one of the main tools in yoga therapy. Breathing pattern and pace change with emotions, such as anger, fear, shock, emotional imbalance, anxiety, and pain. Irregular or short breathing can be a result of, or a cause for, chronic illness and chronic stress.

By the practice of conscious breathing, and practice of particular breathing techniques, it becomes a tool to create mental focus and awareness, and finally to influence emotions.

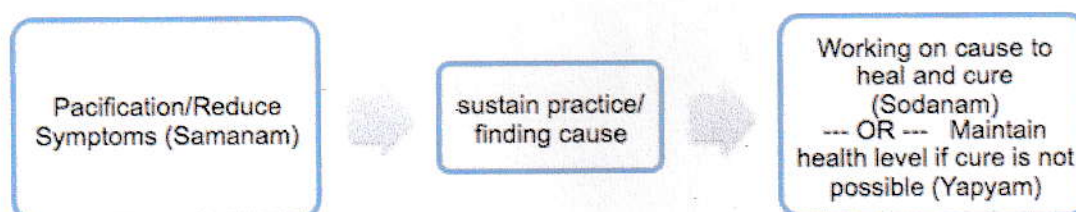
The physical poses and dynamic movements (Asana) of yoga are adapted to the ability of the practitioner. They bring strength and ease into the body structure and body system, which supports tension release, reduction of acidity and restlessness in the body. It also gives all the benefits of a moderate, regular exercise. Specific poses aim at specific parts of the body, hence practicing a tailor-made and over time reassessed combination of poses is a most effective way of practice.

Asana and Pranayama combined with the mental focus on the practice produce an effect larger than the sum of its components and mobilizes health-promoting forces from within the person, starting on whichever level accessible at that particular moment.

It is anticipated that participants of this study would experience improvements in the perception of feeling stressed and/or overwhelmed, achieve higher levels of emotional well-being and improve sleep quality, all of which over time would result in reduction of symptoms and cause of stress.

During the first class personal questions and observations give a first guideline of direction, then a first set of asana-s and simple conscious breathing practice are 'tested' on the person. A first course for practice consists of a course of simple dynamic poses to be practiced in the rhythm of the breath, with one to two breathing practices and ending with a moment of sitting in silence. The poses will become more complex as time goes on, i.e. combining poses to a Vinyasa, coordinating them with breath and sound or breath and visualization, or breath and hand movements; the practice keeps the meditative, self-observing, introverted nature throughout the study and is always ended with breathing practice and sitting still. Students are taught the significance of following the practice in the given order, as the course follows the logic of a build-up, but they are also instructed to not do a pose if it created pain or discomfort.

Typical Steps of Progression in Yoga Therapy:



Results and Findings of Study

Participant's Progress and Response

Felt Work Pressure and Typical Behavior according to the ISMA Questionnaire

This questionnaire consists of 25 questions focused on work pressure as well as their typical behavior (see sample of questionnaire in appendix 1).

The creators of the ISMA Test have commented the score results as follows:

Most of us can manage varying amounts of pressure without feeling stressed. However too much or excessive pressure, often created by our own thinking patterns and life experiences, can overstretch our ability to cope and then stress is experienced.

4 points or less: You are least likely to suffer from stress-related illness.

5 - 13 points: You are more likely to experience stress related ill health either mental, physical or both. You would benefit from stress management / counseling or advice to help in the identified areas.

14 points or more: You are the most prone to stress showing a great many traits or characteristics that are creating un-healthy behaviors. This means that you are also more likely to experience stress & stress-related illness e.g. diabetes, irritable bowel, migraine, back and neck pain, high blood pressure, heart disease/strokes, mental ill health (depression, anxiety & stress). It is important to seek professional help or stress management counseling. Consult your medical practitioner.

The six participants who completed this study have scored between 10-16 points when completing their first questionnaire, and between 8-15 at the end of the 3 months.

Five of the participants have reduced their scores over the 3-month period; one participant showed an increase of stress level at the end of the 3-month period (person 4, shown in red in the diagram). To that is to say that his father was hospitalized and subsequently moved in with his family during the second half of the study.

Three of the participants have not filled in Q3, hence there's no connecting line in the diagram below (Table 1).

It is interesting that those with more frequent classes (which also happened to be the three women) lowered their stress levels more significantly during the study period than those with fewer classes. (Person 1,2,3 all of them women, had 9, 10, and 11 classes respectively; person 4,5,6 all of them men, had 6, 6, and 7 classes respectively).

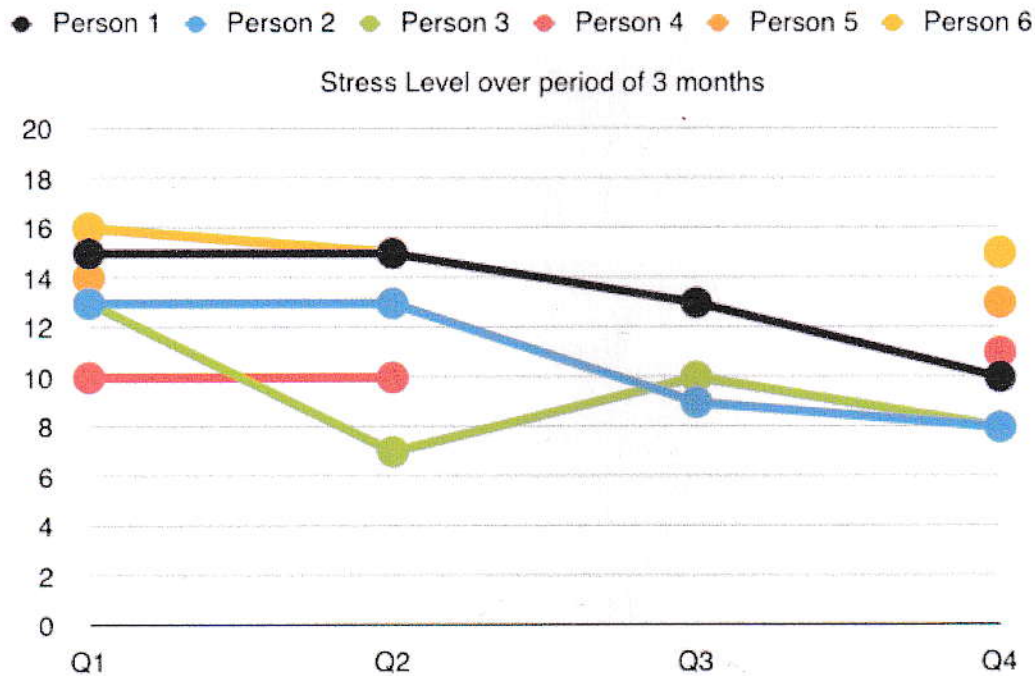


Table 1

Perceived Stress according to the Perceived Stress Scale (PSS) by Sheldon Cohen

The test consists of 10 questions focusing on perception of the current life situation, i.e. feelings and thoughts within the last month, in relation to life in general (see sample in appendix 2). Extensive polls made with this test are available and show that the mean score is by 13 points²². Higher points show higher perceived stress, which means higher stress on an emotional level. All our 6 participants scored clearly above average with 19-29 points at the time of Q1 and lowered it to 10-26 points at the time of Q4. Contrary to the tendency shown by the ISMA test (in table 1), The PSS test results of those with more classes (which happened to be the women) did not lower more significantly than those with less classes. However, all of them show improvement (lower scores) after the 3 months.

Comparison of the ISMA and the PSS test

When translating both test results (ISMA on work pressure/behavior and PSS on perception/feelings) into comparable figures, i.e. the maximum amount of score is 100%, the relation of the two tests against each other can be compared as well. It shows that for some, the perceived stress is greater than work pressure. For half of the participants the figures show parallel movements between the two tests. For two participants there is no obvious pattern and one of the participants (person 3) has surprisingly high scores in the PSS test compared to the stress level test.

²² See table of score at the end of appendix 2

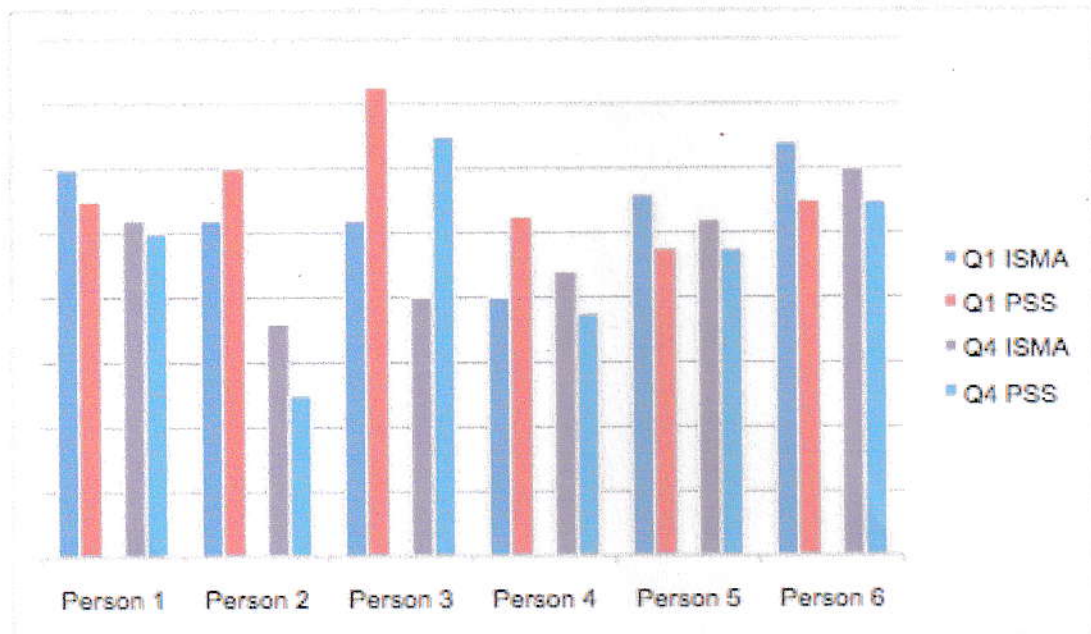


Table 2, shows each person's results of ISMA and PSS tests before (Q1) and after (Q4) intervention.

Physical Well-being

The questions about the physical health were divided into queries on aches and pain, digestion and sleep. Participants were asked the same self-assessing questions in every questionnaire.

General Pattern

Regarding this self-assessment of physical health it is noteworthy that 4 out of six participants scored higher (higher in this context equals worse physical health) in the 2nd questionnaire compared the first. In the reflection when asked to look back over the 3 months however, all of them felt that their physical health had improved overall, and the scores after the 3-month period were lower than when they started. With one exception: Person 4, scored slightly higher at the end of the 3 months than at the beginning (the time of Q1), but lower than at the time of Q2. He was also the only person showing slightly higher stress levels in the ISMA test (see above) at the end of the 3 months, compared to the time of Q1.

Question: Is the yoga practice and/or the questionnaire making them more aware of physical issues they would not usually pay attention to? Or did the first month of practice aggravate physical issues?

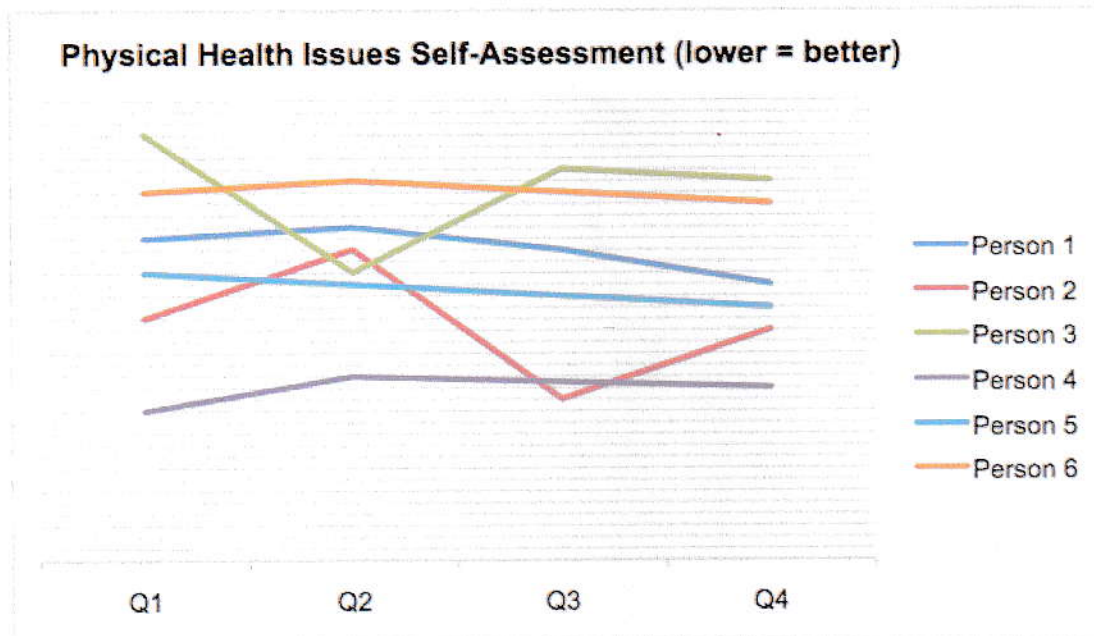


Table 3

The overall physical health issues, including sleep and digestion, when reflected upon over the 3-month period showed a clear improvement for person 1 and 3, worsening for person 4 and only slight improvements for the others.

Main suffering identified throughout study: sleep and physical exhaustion

The biggest physical health issue according to the questions asked was the quality of sleep; however, the sleep issues did not improve significantly over the 3 months period: At the time of Q1, 4 out of six said that they where “not rested in the morning”, and this happened “fairly often” to two of them and “very often” to the other two. At the time of Q4, all four still stated to feel “not rested in the morning” “fairly often”. Also mentioned by all participants and an interesting factor considering that all of them have sedentary office jobs, is that they all stated to be “physically exhausted” “fairly often”, one person even said “very often”. There was no improvement over the course of the three months. Even though two participants in their reflection over the 3 months said they were “physically exhausted” “less often”, they still marked “fairly often” in the questionnaire.

Question: Is being “physically exhausted” the result of not using the physical body in daily life? Or is it the mental stress that makes them feel physically exhausted? Or a combination? And, is this the exhaustion mentioned in phase 3 of Selye’s GAS model?

Overall rating of well-being throughout study

The overall well-being certainly is a mix of factors and one will influence the other. It is out of the range of these questionnaires to include all factors; the socio-economical factors as well as the quality of relationships with other people have not been touched in this study.

Participants reflection on process over the 3-month period:

	Person 1	Person 2	Person 3	Person 4	Person 5	Person 6
Feeling at ease in body	up	up	up	Partially up	up	up
Awareness of tensions	up	up	up	--	up	up
Awareness of breath	up	up	up	--	up	up
Ability to relax body	up	up	up	up	--	--
Ability to relax mind	up	up	up	--	--	--
Ability to focus	up	up	--	--	up	--
Negative effect	no	no	no	no	no	Additional muscle ache
Benefit	Positive mindset, believe/see alternative lifestyle	Stay focused, release tension, feel stronger	Healthier body and mind, awareness of tension in body and mind	Strength in arms, knees improved	Better concentration , enjoy it as 30 mins of relaxation per day	Learned to relax and concentrate during practice
Changes	Better communication in relationships , calmer, steadier mood	Happier	Calmer, healthier	--	--	Daily practice
Learned	I am capable of moving, relaxation, feel refreshed after practice, positive to mind	I am strong	Yoga makes life easier, increases body health	Long exhale relaxes, value of resting in btw poses to relax muscles	Learned to relax during practice	New life form, so far practiced one single form of exercise only

Table 4

Progress according to frequency of practice

Except for person 1 and person 5, all participants practiced on a regular bases. The above-mentioned findings do not reflect the issue of frequent practice in an obvious way. Having said that I would like to add that person 1 had the most classes with the teacher, thus was corrected more and received more verbal counseling, hence still showed progress in her practice overall, where as person 5 in addition to irregular practice also had the least number of classes among the participants. His progress was minimal, particularly on a physical level, he did however realize that the yoga practice

gave him the new experience of shutting out the mind chatter during practice. Sadly he did not immerse deeply enough into this new practice of yoga, so that it never became a pattern or part of his lifestyle, let alone a priority.

Progress according to quality of practice – awareness of body, breath and mind

All participants were taught to practice Asana synchronized with breath; further, all participants were taught Pranayama and, at a later stage including counting and/or Nyasa (hand placements/hand movements). Yoga practiced this way, naturally provides connection with body, mind, and breath. However it is interesting to see that when asked about it (in Q4) not everyone stated that an awareness of body, mind, and breath was raised by the practice. This suggests that either mind was not focused when practicing or the connection did not become conscious.

Comparing the personal reflection in Q4 with the progress of stress level reduction, those participants whose yoga practice raised their awareness of the physical body as well as the patterns of breath and of mind showed more progress towards healthier stress levels than those whose practice raised their body awareness only.

Analysis and Observations of the Findings

The Response

Those who respond well to the intervention and those who don't

Why some participants connect on all three above mentioned levels and are aware of it while others don't, could have to do with the practice given, but, other reasons could have contributed to the different outcomes as well:

A) Preconception of what yoga is and can do. At the first meeting, all participants were asked about their personal expectation of yoga practice. Their answers can be grouped into a) expectations on a physical level only, such as "more flexibility", getting "stronger and healthier" and b) expectations on a physical as well as mental level, including "reduce nervousness", "de-stress", gain "emotional balance". The 2 participants who solely connected on a physical level belonged to group a). Could it be that the results were only recognized within the frame of one's expectations?

B) Time and practice. Those who connected solely on a physical level not only had less classes with the teacher but also may have been at a different point in their personal growth, hence they would need more time to practice to gain further awareness.

C) Life experience shaped by one's type of profession. Since all participants are middle age, the time spent in professional life will have shaped awareness towards one area or another. The profession of those who connected on all levels: teacher, research fellow, student, and airline pilot. The profession of those who connected with the physical level only: IT professionals.

D) Gender. Those who saw the increase of awareness on a pure physical level, were men. Are men less receptive/open for new teaching?

The relationship with the teacher

Another factor why some participants responded better than others is obviously the connection with the teacher, and that point shows interesting comparison within this study group as well. Naturally the chemistry between people makes it easier or more difficult to create a relationship and through that a connection. Those with whom I had a stronger connection did respond better to the practice. Even among the three men, with whom I had a more distanced connection than to the women, I found that the one I connected best with (person 5) responded best too.

In addition, the location and setting of the classes, is an important point to analyze as well:

Person 1 – I went to her house for the classes and she made sure that there was no disturbance at that time in her house. We established a very good relationship and she continued with the yoga classes after the study period.

Person 2 – I went to her house for the classes and she made sure that there was no disturbance at that time in her house. We established a very good relationship. She has stopped classes for the time being but I know that she continues with the practice.

Person 3 – She came to my house for the classes and there was no disturbance. We established a very good relationship. She was sad having to stop classes when she moved overseas 2 months after the study ended.

Person 4 – We met at his house two times until I realized that he was too occupied with “hosting” me, making sure I was comfortable; therefore I used a room in the city for the following yoga classes. We kept a distanced relationship. Although he was openly talking about personal issues, I felt that his politeness was between us. Even in hindsight I would not know how to go about this. After the study was finished he did not continue with classes.

Person 5 – We met at various places and often rescheduled at last minute, due to his irregular schedule at work, we met twice under trees in the shade within a public park. Those two times we would meet at a subway station and then walk to the park, during the walking we talked casually and that was a very good preparation for the session and important for the building of a good relationship. There was interest from both sides. He stopped classes because he could not keep up a regular practice.

Person 6 – We held the classes in the meeting room of his office during lunch time. There was no disturbance and he felt ok about it, but in hindsight I guess both the timing and the location were not in favor for him to relax and probably also not in favor to establishing a somewhat casual relationship with a person from outside. The work was too present.

Changing Viewpoint Over Time

Except for the one person (Person 2, who was the only participant among the six who had some yoga lessons before) it is fair to say that at the beginning of the study they were surprised to get questions on their mental wellbeing within the yoga therapy

study as they had no concept of the holistic nature of yoga but rather had the idea of it being focused on the physical body only. It was a pleasure to see how, with the practice, some connection happened by itself, i.e. after the 2nd class Person 1 said: "Oh, is it possible that the pain and tension in the upper back comes from my fear?", or Person 3 during the 3rd class: "I notice that the yoga practice takes away my irritations, this motivates me to do the practice every morning". Person 5 noted: "At first, the breathing practices (6 conscious breaths followed by extending length of exhale, later extending inhale and exhale) would make me fall asleep, now I can do them staying awake and I notice that this is the first time I experience not having constant racing thoughts in my head".

From more than one participant I had feedback statements that showed how the practice opened a window into something new. Some examples: Person 1 wrote in her reflection on the practice that she is now "able to believe there is an alternative [way of] living". And Person 5 who states: "It is very relaxing to free the mind during yoga session, and it is then I realize how much 'stuff' is in my head." And Person 6 learned that yoga practice provided him a "new life form other than just practicing a single form of exercise [all the time]."

Verbatim
in
Italics.

Person 1

The yoga practice definitely opened new views for Person 1. She is an academic, sitting at her desk all day. She feels that her body is stiff and aches and wants "some exercise to move and sweat". She is annoyed by the fat around her belly and shows little trust in her physical body. Often she asks me "you think I can do that?" when challenged with a pose. When tears welled up during rest in 'savasana', she was surprised as she thought she "wasn't doing anything". She never mentioned emotions in a feedback form. She asked me to have weekly classes as "she felt she could relax in a guided class in a way she felt not able to do on her own". She had a tendency to rush through her practice when not supervised; being guided in practice kept her in the moment, which in turn gave the feeling of being truly relaxed after. As a teacher I hope that she'll look for that same feeling of presence in her daily practice, rather than do it in order to tick it off the to-do list. The three months were not long enough to teach her that. Her stress level, though improved, is still high, her sleep pattern still irregular. But she now is "able to believe that there is an alternative living", she "believes that yoga practice can make physical pain go away and bring positivity to my mind", and "I find my mind becoming more positive and it helps to allow myself to set-up a positive living schedule." That the yoga practice will influence her life on these many levels was unexpected for her and will keep her practice going.

Person 2

One person that went through all steps of progression is person 2. Looking at Table 2, Person 2 displays an interesting pattern: At the time of Q1, her stress level on work pressure and behavior pattern shows a score of 13 points, which is high, but not very high. Her emotional stress level (PSS) however was very high. She felt that she "fairly often" could not cope with all the things she had to do, states that she gets upset about something happening unexpectedly "very often" and notes that things *out of her control make her angry "fairly often", she is getting frustrated about things like having to wait in queue and fittingly, she states that she feels "nervous and stressed" "fairly often".*

One month later

By the time of Q2, she “sometimes” cannot cope with all the things she has to do, and still feels upset about things that happen unexpectedly “fairly often” and still feels “nervous and stressed” “fairly often” too. By Q3 however, she “almost never” feels upset about things that happen unexpectedly and only “sometimes” feels “nervous and stressed”. Her PSS score was now as low as 10, which is below average. What happened? By the time of Q3 there were a few things she was doing parallel to her yoga practice, she changed her diet and immersed in playing an instrument, in short, she was initiative and looked for positive change in many areas of her life. Whether or not the yoga practice motivated or even gave her strength for it, is hard to make out. What I can say from observation is that I met a fussy person, complaining of ankle problem, the weather getting to her, feeling stressed and frustrated over this and that, and many ideas of which poses she could not do because of sinus or foot or something else – a fussy person she was. And through the stability she gained over time, her self-observation skills were no longer random and scattered but now focused on her practice, which made her a very fast learner, who noted what caused what in her practice.

She went from not being aware of her breath and finding it hard to synchronize breath and movement to someone who recognized yoga practice as her tool to manage her wellbeing. She has observed the effects of the different Asana and Pranayama practices and has taken ownership of her practice. Depending on how she feels, she will change her daily practice, she has started to see where she was ‘pretending’ to be weak and where she actually has to listen to her body symptoms in terms of nourishment, sleep and work pressure. She says: “Through yoga practice I can learn to trust my body and sense.” She uses the learnt yoga tool to manage stress throughout the day: “when I feel conscious of my stress, I will do the breathing exercises”. Stress is known to alter pain perception. She used to complain about aches and pain, where as her focus now changed to how she can make herself feel better. The shift of focus shows in her answer when asked about changes noticed during the 3-months of practice, she answers “Happier!” and her big learning from the yoga practice is: “I am strong!”

Person 3

A less steady process - we seemed to go from one symptom to the next – but also a kind of empowerment happened to Person 3. In this case, Antonovsky’s SOC theory, the need to experience life as coherent (meaningful, manageable and comprehensible) in order to stay in a healthy balance seemed very appropriate. Person 3 experienced her life as meaningful; motivation to look for solution was plenty but life events did not all make sense to her and she did not feel she had the resources to manage. The yoga practice gave her an anchor, a practical tool to calm and steady her emotions and irritations. Her health issues at the time of Q1 were “over-sensitive to smell” and “over-sensitive to different rice types”; she was prescribed medicine “for a sensitive stomach”. These symptoms subsided, but not long later she showed a swelling of hands and joint-pain in the fingers, which she related to humid and cold weather. Two months into the practice, she stated that the “practice gives calmness and grounding”. Then a sudden lower abdomen and lower back pain triggered fear and worries. The yoga practice was adapted to gentle one-legged ‘apanasana’ and lying supine with hands on lower abdomen with breathing practice. A doctor visit revealed low iron but no issues with ovaries or uterus as feared. After two weeks she returned to a more physical practice as she felt the need “to move and get physically tired”. Daily walks where part

of her practice too. By the time of Q4 she looked at the yoga practice as “help to get through the days” and “something to hold on to”. In her case the 3-month period was all about reduction of symptoms and clearly not long enough for her to recognize and work on deeper lying issues. Her stress levels lowered over the three months but, especially on perception and feelings, remained high. However she had full trust in her practice as she noticed that it helped remove some and reduce others of her symptoms and felt “[it] helps me to live my life easy”.

Person 6

On the other side of the spectrum is person 6 who, according to his own observation made little progress within the 3-months. He runs and trains for marathons, for him, the yoga practice is to balance his stressful office job; to “stay healthy”.

Yoga is a new exercise to him and as such welcome, because he cannot run every day. Pain in the lower back and foot stop him from running too often. He knows that his body is tense and stiff but still prefers cardio exercises; the slow dynamic yoga movements are testing his patience. Nonetheless he practices his personalized yoga course with great discipline. His lower back pain improved and so did his right foot: “I can now run 10 km before my right foot is in pain, it used to be 5 km only”, but his neck pain only improved “a bit”, and “the frequency of waking up at night “dropped” but his sleep stays disturbed. As a therapist I felt it was too early to ask whether it could be that the marathon running actually adds to his stress, rather than releases it. I feel it would be more beneficial if the question came from him (one day).

During practice, he diligently synchronizes movement with breath and does it slowly which has lengthened his breath, though he does find it hard to sink into the rhythm of breath. When he practices it feels as if the mind is dictating the rhythm, not the breath. Noting that the yoga practice activates muscles he never usually uses, he blames the practice of creating additional tension in body, which he is quick to rate as “manageable”. As a benefit of the 3-month practice he states, “I am learning to try to relax and concentrate during practice”. All these comments show that he is trying hard, too hard. The voice of the body is still a nuisance rather than a guiding tool, the mind overpowering all. After 3 months we’re still at the beginning of the process. However, when asked what he learned from yoga practice he says: “A new life form other than just practicing a single form of exercise”. Interesting wording! Calling it a “life form”, he obviously recognizes, consciously or not, that yoga penetrates more than the physical body.

This reminds me of sloka V-II from *Yogajalisaram*: “There is the practice of yoga of the self, the body and the mind, always fruitful, never wasted, it gives each through practice what he seeks.”

Observation on Study Method

The questionnaire in Part 3 with 10 questions (also following a standard test, see (21)) proved to be a good tool to double check on Part 2 and move deeper into the emotional state of the person. Though the group of participants is not large enough for a quantitative study, the comparison of participants inspired me to look at each person from different angles. Table 2 showed me the complexity of a person and reassured me as a yoga therapist that each person is more unique than what I can perceive at one

meeting and deserves an open kind of looking at them each time we meet. Had I not compared them to each other, I would have missed the variety.

The study method and number of participants was in no way comprehensive enough to come to conclusions that could be made public, but it did bring up questions, which would need to be included in a future study on the issue on yoga as modality for stress relief.

As a follow up I would definitely be interested to confirm whether the cause of the feeling of being "physically exhausted" that the participants shared, is indeed the same as phase 3 of Hans Selye's General Adaptation Syndrome (see in the first chapter on stress), and then find out how to tackle it, as this is one of the "sufferings" that did not show improvement after the 3 months, or to find out whether this is simply a matter of time.

Though communication and dialogue with the participant was part of the yoga sessions, i.e. checking-in, asking about the yoga practice and general well being, I have not made stress a topic as such during conversations, rather we talked about the symptoms (insomnia, pain, tensions) and lifestyle patterns such as eating habits, computer and sleep habits. I do feel that for their healing progress it would be essential for their progress to now discuss findings of the questionnaires in regards to stress and discuss the topic directly, including hearing from them where they think their stress comes from.

I did notice that although the questionnaires had surprised them at first, it did help them with their process of reflection and one student even openly thanked me for presenting all these questions to her as it brought things to light she has not admitted to herself before. This leads me to think that it may be helpful for some yoga therapy sessions to be complemented with a list of questions about perceived stress not just in the first session but in some intervals to follow-up throughout the process.

Conclusion

Study Size

Larger studies are necessary to define better the cases and settings in which yoga is most effective. Although more research is needed, the results indicate that yoga is a suitable treatment for stress related disorders over a longer period of time. To combat the phenomena of feeling "physically exhausted" as described by most participants (see above), it may need more time. Furthermore yoga therapy may be most effective in combination with additional physical activity intertwined in the daily schedule, such as walking or other forms of physical activity, as long as it isn't a competitive activity.

New Openings

Even though getting into a habit of daily yoga practice was difficult for some participants, most responded positively to the intervention in that they enjoyed the practice, the time to themselves, and felt they learned something new and gained

Even though study sample size is small it is appropriate for Qualitative Enquiry.

practice, the time to themselves, and felt they learned something new and gained awareness of the connection between physical wellbeing and the state of mind.

I felt very touched by the little realization-moments, when I could feel a connection happening, a penny dropping, as described in changing viewpoints above. Also touching are genuine comments like this from person 5: "I learned how to relax, something I can't do even when I am on holiday, mind is always full of tasks and jobs to be completed, but I was able to put down my work during yoga, and that is important for me." He also said that he was able to relax body and mind during the yoga practice only, and after practice he would "return to his old self". As a yoga therapist I recognize that this, though "only during the practice" is the opportunity, the opening, which could be the beginning of a major change in life circumstances. But for that of course the 3 months of this study are not long enough.

The Experience of Time

It seems to me that the most important aspect of using yoga therapy with people suffering stress is to convey that practicing yoga isn't one more item on their to-do-list to steal their time, but to lead them into feeling that thanks to the yoga practice the perceived time pressure falls away and a new way of perceiving time can be learned. Only then will they stick to their practice and move forward in the process.

The study of Kahn and Byosiere²³ showed that time, together with human relationships, is one of the major stressors in the white-collar working environment.

The questionnaires feedbacks and conversations with the participants of this study also highlighted the feeling of "not having time" as a major stressor. It seems, that poor relationships could also be a result and symptom of the feeling of "lack of time", as maintaining relationships may be seen as stealing time. For many, time is perceived as something like a river that passes by, with opportunities and deadlines rushing by, too far and too fast to catch them. If the yoga practice can give the experience of being part of the river, being part of the flow, then time becomes unlimited; opportunities and deadlines flow with life.

When the mind is focused on the present moment, time loses its pressing character and becomes an expanding space within which things can change and be created. With practice, the practitioner realizes that openings, solutions and realizations can only come out of the timeless space of being in the present moment.

In the timeless space of presence we connect - to ourselves, to each other, to the environment around us, and to the life force: *atha yoga-anusāsanam* (Y.S. 1-1).

23 Kahn, R.L. and Byosiere, P.B. (1992). Stress in organizations. In M.D. Dunnette and L.M. Hugh (eds.). *Handbook of Industrial and Organizational Psychology*. (pp.571-650). Palo Alto, CA: Consulting Psychologists Press.

Annex 1

STRESS QUESTIONNAIRE



International Stress
Management Association UK

Promoting stress prevention and well-being

Because everyone reacts to stress in his or her own way, no one stress test can give you a complete diagnosis of your stress levels. This stress test is intended to give you an **overview** only. Please see a Stress Management Consultant for a more in depth analysis.

Answer **all** the questions but just tick one box that applies to you, either yes or no. Answer yes, *even if only part of a question applies to you*. Take your time, but please be completely honest with your answers:

		Yes	No
1	I frequently bring work home at night		
2	Not enough hours in the day to do all the things that I must do		
3	I deny or ignore problems in the hope that they will go away		
4	I do the jobs myself to ensure they are done properly		
5	I underestimate how long it takes to do things		
6	I feel that there are too many deadlines in my work / life that are difficult to meet		
7	My self confidence / self esteem is lower than I would like it to be		
8	I frequently have guilty feelings if I relax and do nothing		
9	I find myself thinking about problems even when I am supposed to be relaxing		
10	I feel fatigued or tired even when I wake after an adequate sleep		
11	I often nod or finish other peoples sentences for them when they speak slowly		
12	I have a tendency to eat, talk, walk and drive quickly		
13	My appetite has changed, have either a desire to binge or have a loss of appetite / may skip meals		
14	I feel irritated or angry if the car or traffic in front seems to be going too slowly/ I become very frustrated at having to wait in a queue		
15	If something or someone really annoys me I will bottle up my feelings		
16	When I play sport or games, I really try to win whoever I play		
17	I experience mood swings, difficulty making decisions, concentration and memory is impaired		
18	I find fault and criticize others rather than praising, even if it is deserved		
19	I seem to be listening even though I am preoccupied with my own thoughts		
20	My sex drive is lower, can experience changes to menstrual cycle		
21	I find myself grinding my teeth		
22	Increase in muscular aches and pains especially in the neck, head, lower back, shoulders		
23	I am unable to perform tasks as well as I used to, my judgment is clouded or not as good as it was		
24	I find I have a greater dependency on alcohol, caffeine, nicotine or drugs		
25	I find that I don't have time for many interests / hobbies outside of work		
A yes answer score = 1 (one), and a no answer score = 0 (zero).		TOTALS	

Your score:

Most of us can manage varying amounts of pressure without feeling stressed. However too much or excessive pressure, often created by our own thinking patterns and life experiences, can overstretch our ability to cope and then stress is experienced.

4 points or less: You are least likely to suffer from stress-related illness.

5 - 13 points: You are more likely to experience stress related ill health either mental, physical or both. You would benefit from stress management / counseling or advice to help in the identified areas.

14 points or more: You are the most prone to stress showing a great many traits or characteristics that are creating un-healthy behaviours. This means that you are also more likely to experience stress & stress-related illness e.g. diabetes, irritable bowel, migraine, back and neck pain, high blood pressure, heart disease/strokes, mental ill health (depression, anxiety & stress). It is important to seek professional help or stress management counseling. Consult your medical practitioner.

Tips to help improve your score

Review the questions that you scored yes:

- See if you can reduce, change or modify this trait.
- Start with the ones that are easiest & most likely to be successful for you.
- Only expect small changes to start with, it takes daily practice to make any change.
- Support from friends, family/colleagues will make the process easier and more enjoyable.
- Professional help is always available & your GP is a good place to start.

To find a stress management counsellor in your area you can contact:
The International Stress Management Association (ISMA^{UK}) on
T: 01179 697284 E: stress@isma.org.uk W: www.isma.org.uk

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Annex 2

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (Circle): **M** **F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly? 0 1 2 3 4
2. In the last month, how often have you felt that you were unable to control the important things in your life? 0 1 2 3 4
3. In the last month, how often have you felt nervous and "stressed"? 0 1 2 3 4
4. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4
5. In the last month, how often have you felt that things were going your way? 0 1 2 3 4
6. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4
7. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4
8. In the last month, how often have you felt that you were on top of things?.. 0 1 2 3 4
9. In the last month, how often have you been angered because of things that were outside of your control? 0 1 2 3 4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

Please feel free to use the *Perceived Stress Scale* for your research.

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References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
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PERCEIVED STRESS SCALE

Sheldon Cohen

The *Perceived Stress Scale* (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least a junior high school education. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way.

Evidence for Validity: Higher PSS scores were associated with (for example):

- failure to quit smoking
- failure among diabetics to control blood sugar levels
- greater vulnerability to stressful life-event-elicited depressive symptoms
- more colds

Health status relationship to PSS: Cohen et al. (1988) show correlations with PSS and: Stress Measures, Self-Reported Health and Health Services Measures, Health Behavior Measures, Smoking Status, Help Seeking Behavior.

Temporal Nature: Because levels of appraised stress should be influenced by daily hassles, major events, and changes in coping resources, predictive validity of the PSS is expected to fall off rapidly after four to eight weeks.

Scoring: PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items. A short 4 item scale can be made from questions 2, 4, 5 and 10 of the PSS 10 item scale.

Norm Groups: L. Harris Poll gathered information on 2,387 respondents in the U.S.

Norm Table for the PSS 10 item inventory

Category	N	Mean	S.D.
Gender			
Male	926	12.1	5.9
Female	1406	13.7	6.6
Age			
18-29	645	14.2	6.2
30-44	750	13.0	6.2
45-54	285	12.6	6.1
55-64	282	11.9	6.9
65 & older	296	12.0	6.3
Race			
white	1924	12.8	6.2
Hispanic	98	14.0	6.9
black	176	14.7	7.2
other minority	50	14.1	5.0