

### **Ongoing Research In India**

By Dr. Shirley Telles, Patanjali, Haridwar

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Good Afternoon, Namaste,

I bring you greetings from our institution which is in the north of India close to the foothills of the Himalayas. In the next 40 minutes or so, I will tell you about yoga for physical and mental well-being. So let's look at it in different way. Physical – mental we look at this in two aspects: the emotional aspect and the intellect. We also look at the inward thinking and the spiritual aspect of yoga. All this is based on scientific research.

When we talk about physical well-being there are many things we can talk about, but I am going to touch on four of them: weight management, obesity is a big problem the world over; physical activity; a life free from pain, whether it's a small headache or the terrible pain which a person who is a cancer survivor or a person who is end of life stage is having pain and is suffering from it, and we will all need, particularly as we grow older, better flexibility, the ability to move freely, less of back pain, the ability to move freely. So let's see food choices to begin with. When we talk about food choices why do we talk about it? Obesity is an epidemic the world over. It is just spreading like anything. And in India particularly, you will notice, and in South Asia, India, Pakistan, Bangladesh, Sri Lanka, there is what is called “central obesity”. The peoples' hands and legs will be thin but they will have weight around their waists. And this is particularly dangerous because it is packed between the organs this is called “visceral fat”. It is very difficult to lose the weight and it is associated with coronary heart disease, type 2 diabetes, cancers: cancer of the breast, cancer of the ovaries; cancer of the uterus, and in males, cancer of the prostate.

So we have done a study that yoga helps to reduce central obesity and that was published in Medical Science Monitor, one study in 2010 and one in 2011 and if you are interested in any of these studies write to me, I'll be happy to send you the papers.

But we are interested in the mechanism. How does yoga help us to lose weight? There is this very important chemical called “leptin”. Leptin is produced by the fat cells. See how wonderful our body is. If we start gaining weight, our fat cells produce this chemical, called “leptin”, which is produced in the body and suppresses the appetite. So it gives signals to the hypothalamus in the brain, “Stop eating!”. So it is a natural mechanism to suppress the appetite. But because we might see a nice chocolate, it's Christmas season, so we might see a nice dessert. We forget about our leptin. We say, “Leptin, go to sleep!”, and we eat a little extra. So can we do something to increase the leptin?

We did a trial comparing- a randomized control trial comparing, we had 90 people, 45 in each group, a yoga group and a walking group. They had 45 minutes of yoga or walking 2x a day for 15 days and we checked their levels of leptin at the beginning, that's the red bar, and at the end of 15 days. And you see that both yoga and walking increased leptin levels, right? But the increase was a little more for yoga. So walking is good, and yoga is possibly a just little bit more effective because of the emotional effects you'll see in a minute. Now we are very excited to do a larger study. We had these 92 people in October 2015 in our centre we have large numbers and we randomized them as two groups of 46 each. One had a calorie restricted diet of 900 kilo-calories and the other had unrestricted, 1800 or 1900 Kcal. And so we said, restricting the diet but giving yoga, will it make a difference to the BMI, the Body Mass Index?

You can see that irrespective of whether the diet was reduced or the diet was not reduced, the Body Mass Index didn't raise almost the same with the yoga practice. So the idea that people should eat less is not good, that is really a wrong idea. Instead, eat properly and spend the calories.

We also looked at the body fat percentage. When you do the body composition analysis, it is important to know how much muscle there is, how much fat there is, how much water there is. So sometimes when a person loses weight, they just lose body water. That is very dangerous. They can get dehydrated. Sometimes just before the Oscars people want to fit into a very tight gown so they take diuretics. That's not good. So you lose body water. Instead what we have to do is, lose the fat. You can see, irrespective of whether the calories were reduced or not reduced body fat reduced with yoga practice and Leptin. We did a larger trial now that was a smaller samples both diets with yoga increased leptin, leptin being the appetite suppressor.

So I really want to put this strongly in our minds. And so now our target is this February, we are very excited in our institution, we are launching this movement across the sub-continent targeting 6000 obese people drawn from all the states in India, that is, the 29 states and the union territory of Delhi, and 200 persons per state and we want to see over a one year period what is the effect of yoga. I hope that I'll be able to share these results with you fairly soon.

So how does yoga help to lose weight, by helping us at the level of intellect to choose what to eat? We have a lovely buffet outside. Do we choose the cake or do we choose the fruit, Healthy food choices.

What about physical activity? Yoga is not a physical activity, and it is. But it's not exactly a physical activity. Why? There are three main differences. You can run on a treadmill, and you can listen to an iPod or you can watch the television or you can talk to someone. But yoga is not like that. When you are doing yoga you have to go inwards. Close your eyes and go inwards. Yoga is all about internal awareness. It is a journey into your own body, into your own mind, into your own spirit.

So, yoga is awareness. That's the first difference. Yoga is relaxation. You can't say, "I'll squeeze in ten minutes of yoga and then run to work. Yoga has to be done in a very relaxed mental state and on an empty stomach; otherwise we could have had a yoga practice session now. And a third point is always synchronizing, and all of you must be doing it, your yoga practice with your breath. So, one movement breathe in, another movement, breathe out. Preferably inhale, exhale, in the ratio one is to two. Exhalation is longer than inhalation. So, which are the practices that we particularly recommend in our organization? High frequency yoga breathing, where you contract the anterior abdominal wall. I'm not doing too much, because after eating you shouldn't do this. But you actually contract it with each exhalation, you push it in. And it's very good for weight loss.

Kapala is "forehead", bhati means "shining". It's a very interesting practice. Why? We can actually measure how much the energy expenditure is like this in our laboratory. This is a photo of our laboratory and we record in real time during the practice of kapal-bhati how many calories are being burned. And you can see here before, it's the red bar. It increases during the practice by 41% and after it comes immediately back to normal. Not like sometimes when we go jogging where oxygen consumption remains high. So it is just raised during the period of the practice.

So I leave it there. There are many, many more techniques, if you have questions at this time we can talk about it. What about living free from pain? This is something we all want for physical well-being.

So we looked at three main things: rheumatoid arthritis, herniated disc, particularly MRI proven cases. So we've actually taken the MRI of the spine, seen degenerative changes in the inter vertebral discs, the discs which lie between the vertebrae and we've also looked at tension headaches. These are the three things. We've found, and these are the references where we published this, that it increases the pain threshold. People can tolerate pain better. And it relieves spasms, particularly in the back muscles and, if you don't want to think about pain, it is easier with the practice of yoga, to shut it out at will.

What about flexibility and motor skills? And, in fact I just got the email today that one more paper in this study, which is a randomized control trial on yoga for MRI proven changes in the inter vertebral disc. It was a very interesting thing. The people had actual changes in the disc and we gave them yoga. Three months later we checked the MRI again. Nothing has changed - the disc remains the same. But the level of pain, the level of well-being, the level of flexibility was better. What's happening? We don't know. They're not exerting themselves, but they were feeling better. That's the truth. The discs had not changed. The MRI said, "There is no change in these people." They are not taking so much medicine. Maybe there are many other ways. Maybe we are generating good chemicals in our body.

And that brings me to yoga and emotions. We have our happy chemicals. And that's what we should try to generate through yoga. It's well known that through the practice of yoga, happy chemicals like dopamine and serotonin are increased and that's the basis of using specific yoga practices for depression and even for addressing trauma, like post-traumatic stress disorder, any type of trauma, indeed. It also increases the endorphins and more recently there is a lot of research on oxytocin, which is called the "hugging hormone". It doesn't mean we have to hug a person. You think a nice thought about another person, oxytocin is secreted in your brain and you feel good.

So we did a study on school children and that is their institution right up in the north of India even above Delhi and it was published in the Journal of Child and Adolescent Psychiatry because these were all pre-teens. So we did 90 children again. 45 were given yoga five times in the week just for 40 minutes and the others were given physical exercise. We looked at a whole battery of physical fitness tests, cognitive functions, emotional well-being and the teacher's reports: how punctual are they; how do they behave with other children, and so on. Now these are the two groups of children. We thoroughly enjoyed the project. You can see they are pre-teens. And as I said the three differences yoga is always with awareness, relaxation and respiration is a very big, integral part of yoga. Preferably inhale, exhale in the ratio of one is to two.

Well self-esteem, what is it? The better we think about ourselves the better we feel. So we asked these young children, these pre-teens, "Well, if you do not feel good about yourselves, when do you not feel good? What are the things? Does something ever make you feel not so good?"

And you will be surprised 66% of the children said, "We don't feel good if we don't get a good rank in class." So it was related to their academic performance. That's why it's a big problem in India. Every time after the major exams, the Tenth standard, the Twelfth standard, you have children, if they don't get 99%, really an astounding percentage, even if they have done very well. They commit suicide, why, because their self-esteem is linked to their academic performance. We need to de-link it. Much more secondary was their physical appearance, or their socio-economic status.

So yoga can build that resilience. We've also got two more papers published this year one in collaboration with Harvard, collaborators there. Yoga in schools in the US, it shows that it builds up the emotional resilience of children and another with collaborators in Brazil.

So a very important part, particularly as I was talking to the collaborators outside India, there's not just the academic performance, but the self-esteem, trying to change the unchangeable. So you have more and more of this nowadays, the fad of dieting, abnormal thinness, and anorexia nervosa. There should be self-awareness not self-criticism. Also we should have a balance between right brain and left brain. The right brain being concerned with aesthetics, creativity, and music appreciation. How many parents

whose children are good at math and science would say, "Don't become an engineer go and be a musician!" It's rare. Right? That's why we need to balance the left and right brain because emotions are expressed through the right brain. And they are considered in Chinese medicine to be more associated and

even in Indian medicine with the feminine aspect in all of us that is the masculine and feminine in everyone and we have to balance the Yin and the Yang. Why? Why is it so necessary? This was said by the person who did the split brain experiment in the 1970's, Roger Sperry. He said that our education system tends to neglect the non-verbal form of intellect. Too much emphasis on maths, science, logic, analysis, not enough, emphasize on music, creativity and art. Modern society discriminates against the right hemisphere. No chance to express emotions.

And we did a phase coherence study of looking at breathing through alternate nostrils. And try and see if it could create coherence. I can do into details, I am sure some of you may have questions. So I will move on these slides are too detailed. We did another study on people who are stressed. Because many occupations nowadays involve a lot of stress. This was a group in north India of army personnel who had been trained to suddenly go and fight wherever there was a need to fight but till then they were free -they had a lot of free time. So the person in charge of the centre said, "These people are really stressed. Because they never know when they'll be sent. Until they are sent they just go river rafting or something else, but in a short while they may be told, in three or four hours you have to go to the border and fight. That is a very stressful situation.

Waiting is often much more stressful than doing. I am sure all of you have experienced this. So the question was, "Can yoga help them to remain alert", because they have to be alert. To talk of yoga and fighting is often strange. But, yes, I mean, that is the truth of today. We do need the military and if we can make them relaxed we are doing a service to the people who are defending us all over the world and yet relaxed. And we did a study and there is a specific yoga model which has to have specific components which I'm not describing here, but if anyone wants I can send you the details.

And we found that the attention was better. We had three groups: a yoga group, a breath awareness group and a classical music group. And it was a randomized controlled trial. And it was published in this journal which is of the American Psychological Association in 2012. What was the result? Yes, this yoga model could help the army personnel to be more relaxed but also retain their ability to be alert. And their reflexes were very good which was important.

What about mental health and well-being through the intellect?

This is a study we did on 647 people, we had a large inpatient facility in our centre where around 700 patients can stay. And we had people with chronic disorders, don't bother-it is a complicated graph. The gist of it is the duration of practice as well as the frequency of practice affects depression which goes along with almost all chronic disorders. So you need a longer duration of practice and you need regular practice for depression to go away. For anxiety and worry it goes away very quickly even if the long duration is not there. That's the gist.

You can ask me any questions on this if it's not very clear. We had one more question. And I thought of the intellect.

In the yoga model we have the asanas, we have breathing, we have meditation.

What about yoga philosophy? Yoga philosophy is universally applicable. It can be taken from the sage dating from around 900 BC or even earlier; it can be from the Upanishads which pre-date that and are really difficult to date. Wherever you source it, but if you have some philosophical principles, you are also stimulating the thought process of the person. So we have people who came to our institution, 300 of them and they all came for stress management. "We said, are you ready for a trial? There is a chance that if you enter the trial you may either get theory only or you may get practice only. And we will assess your anxiety levels before and after. Anyhow at the end you're going to get both." Some said yes, and

some said, no, and those people who agreed and who met our other criteria were included in the trial. We found benefits with both theory and practice, Again, it's been published in psychological reports. I'll be happy to send you the paper.

The better benefits were with practice but interestingly we got reduction in anxiety even with theory alone. Very difficult to imagine because we think that yoga has to be practised, right? So I always tell people wherever, in India or across the world, just put up in your yoga hall one thought so when the person is going into guided relaxation, one thought from the Upanishads, or from any text which you like, one good thought so they go away with a good message.

What about the restorative effects of meditation. We've done several studies, one of them is summarized in 2015 in Biomed Research International, a meta analysis and review. I actually wanted to put this in. A study done by a particularly special guru, who passed away, who left his mortal body last year in 2015 and who believed in silence meditation as restorative. It was a very nice study. As you see, hibernation is restorative and, indeed, whatever variables we measure, showed that meditation was restorative. But meditation need not be the picture on the left. Ideally, one should reach a mental state when you can mediate even in a crowded bus. That is the essence that is goal of yoga. This is how we start. This is how we hope to end. While in the midst of daily life we should be detached but compassionate and full of love. Detachment doesn't mean we don't care anymore about other people. And through the practice of yoga we should be able to be blissfully happy. This is the part at which I'll end. Thank you very much

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### **From Yoga To Yoga Science – To A Core Curriculum Of Yoga**

By Reinhard Bögle , Yoga Forum Munchen, Germany

Reinhard Bögle studied education and specialised on adult education. He is head of yoga teachers' education at the Yoga Forum München, Germany; scientific adviser for System energetics; has taught yoga for sports teachers at the Technical University München. He is Adjunct Professor at the Center for Behavioural Medicine, Pune, India, and member of the board of IASTAM.

Who are we? We are the Yoga Forum Munich which was founded 1990, 25 years ago. The honorary president is Robert Fenzl, the former academic director of the sports teacher education department, Technical University of Munich. There is a scientific advisory board, with Dr. Narendra Bhatt (Ayurveda), Dr. S.N. Bhavsar (Sanskrit, Physics, Yoga, Ayurveda), Dr. Heinz Strauss (founder of System-Energetics a systemic psychology and psychotherapy), Dr. Roland Lüthi (Health Science, Communication), Dr. Leena Phadke (Physiology), Dr. Sanjay Phadke (Neuroscience), et al. I am the director of this institute, which is primarily dedicated to educating yoga teachers.

Why is this pre-workshop important for this first international conference (ICAAM)? Over the last years IASTAM-India hosted several conferences and I had the opportunity to take part in some of them, but this is the first international one. So this year, at least, we thought, this is now the time when the whole world is making a move in the direction of yoga. Because of this fact we are interested in organising this pre-conference on yoga with an interest in health and in yoga.

The WHO has a program for promoting more yoga for the years 2014 to 2023. UNESCO has a program, a very interesting program, Learning to Know, Learning to Do, Learning to Live Together, and, what is very important for yoga, and here is where yoga comes in, Learning to Be. And these are their four pillars of what they think people have to learn in future and this is where yoga comes in, yoga fits very well here.