Research Data on the Prison Smart Breathing Techniques

Background

The science of breath is a 5000 year old integrated science of health promotion and relaxation. Several studies indeed suggest that controlled yogic breathing has effects on physiological markers such as blood pressure (Raghuraj 2008), heart rate variability (Raghuraj 1998) as well as psychological factors such as depression (Khumar 1993, Franzblau 2008). Research has shown that different emotional states are associated with different respiration patterns and that purposeful replication of these respiration patterns in turn leads to the corresponding emotional states (Phillippot 2002), suggesting that using breathing exercises for relaxation may be useful for relaxation.

However, in severe anxiety disorders and PTSD, slow, deep, or abdominal breathing is usually insufficient, as the following study illustrates. An RCT comparing relaxation (simple instructions to relax in a reclining chair), relaxation with deep breathing (gradual filling of the lungs and slow complete exhalation), and relaxation with deep breathing and thermal biofeedback in 90 Vietnam veterans with PTSD found all interventions to be mildly therapeutic. Addition of deep breathing and thermal biofeedback did not produce further improvements on PTSD scales {Watson, Tuorila, et al. 1997 #300}. More intensive yoga breathing using advanced techniques is necessary to ameliorate anxiety and PTSD.

Practitioners of Prison Smart's breathing technique, Sudarshan Kriya Yoga (SKY) report subjective improvement in physical and mental health including an overall feeling of well-being, increase in mental clarity and concentration, a feeling of belongingness, better ability to manage stressful situations and a feeling of calmness and mental alertness.

Below is a summary of research conducted with healthy volunteers as well as with people suffering from PTSD. PTSD is relevant to a prison population because many symptoms of PTSD may lead to criminal behavior and/or violence. Many criminal offenders were raised under violent circumstances.

Past Research

Although most of the studies conducted on SKY to date are pilot studies and therefore relatively small, effect sizes have been large and have reached statistical significance, suggesting potential benefits of SKY for improving health and well-being.

Selected research studies on healthy volunteers:

1. In a pilot study, healthy volunteers who underwent six-weeks of SKY had significantly reduced stress, anxiety and depression as well as increased optimism compared to a control group instructed to relax in an armchair for the same amount of time as the SKY practice (Kjellgren 2007).

2. A number of biological indicators of stress in a healthy population have been shown to decrease as a function of SKY. One study of SKY practitioners evaluated the effect of SKY on antioxidant enzymes and genes involved in oxidative stress, DNA damage, cell cycle control, aging and apoptosis. Compared to healthy controls, SKY practitioners had significantly higher levels of glutathione, glutathione peroxidase, and superoxide dismutase activity. Also, gene expression levels of glutathione S-transferase was significantly higher in SKY practioners. Antiapoptotic Cox-2 and HSP-70 were also significantly higher in SKY practitioners compared to healthy controls. The investigators also found a higher trend of aging related human telomerase reveres transcriptase (hTERT) and antiapoptotic Bcl-2 in SKY practitioners (Sharma 2008). In a study of tobacco abusing cancer patients who completed standard cancer therapy SKY was shown to significantly increase the number of natural killer (NK) cells at 12 and 24 months compared to baseline. The increase in NK cells at 24 weeks was significant when compared to a control group (Kochupillai 2005).

Selected research on populations suffering from PTSD or other forms of psychopathology

1. The Australian government provides extensive services and psychological support for veterans, many of whom served as advanced scouts and survived heavy combat. Thirty-five years later, may Australian Vietnam veterans remain permanently disabled due to chronic PTSD complicated by substance abuse or medical problems. In a rater blind, randomized, wait-list controlled study of 30 disabled Australian Vietnam veterans with PTSD, those given a 5-day course in Sudarshan Kriya Yoga showed significantly greater reductions on the Clinician Administered PTSD Scale (CAPS) than those in the wait-list group {Carter, Byrne, et al. *under review*}. There was statistically significant improvement in scores on the CAPS ($p = 0.007$) in both the test group and in the wait list control group following the SKYY intervention. Statistically significant improvements in alcohol consumption and subscales of depression (MINI-Plus) occurred in both groups following the yoga course. At 6-month follow-up average CAPS scores were about 30 points lower than at baseline. The Veterans also learned how to use the yoga breathing to calm down when they awoke at night or when they felt "road rage." Indices of depression improved and alcohol consumption declined.

2. Patients with PTSD due to sexual abuse benefited when SKYY breathing was combined with traditional psychiatric and psychological therapies {Sageman 2002, Sageman & Brown 2006}. Yoga breathing reduces arousal, anxiety and overreactivity, enabling the patient to recall and discuss traumatic material without feeling overwhelmed. Other beneficial components of SKYY course include cognitive-behavioral teaching and psychoeducation in human values of acceptance, social responsibility, and community service.

3. In one study the practice of SKY lead to 67% remission rates for patients diagnosed with depression after only 4 weeks (Janakiramaiah 2000). In another study of 30 depressed patients treated only with SKY, 22 patients had a clinical response that was sustained for the study duration of 3 months. The pretreatment P300 amplitude did not distinguish responders from non-responders and was not associated with differential rates of response. The authors concluded that SKY therapy was uniformly effective regardless of the pretreatment P300 amplitude (Naga PJ 1998). Among people living with HIV/AIDS, positive changes in well-being on the Mental Health Index (MHI) and the MOS-HIV Health Survey (MOS) were seen immediately following the SKY program (Brazier 2006). Additionally, there is evidence that SKY can effectively

reduce existing depressive symptoms associated with alcohol dependency (Vedamurthachar 2006).

In sum, these studies provide strong preliminary evidence for the effectiveness of SKY on psycho-physiological indicators of stress and well-being.

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