



Annotated Bibliography of Research on Sudarshan Kriya Yoga (SKY) on Its Impact in The Areas of

- 1. Risk Factors for Juvenile Delinquency**
 - 2. Violence**
 - 3. Risk of Future Criminality**
 - 4. Substance Abuse**
 - 5. Post-traumatic Stress Disorder (PTSD)**
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Overview of Sudarshan Kriya Yoga (SKY)

Sudarshan Kriya Yoga (SKY) is a rhythmic breathing technique taught by the Art of Living Foundation, developed by Gurudev Sri Sri Ravi Shankar. It has been studied for its effects on mental health and is supported by 100+ research studies from institutions like Harvard, Yale and Stanford published in peer-reviewed journals over the last 40+ years, across four continents.

For all published papers on SKY as of 2019, see [Annotated Bibliography of Papers on SKY](#) (Patel & Ghahremani, UCLA Semel Institute for Neuroscience and Human Behavior). The document highlights (i) sample size, (ii) study design and (iii) effect sizes. Included are [all available papers in a shared directory for download](#).

Potential Mechanisms at Play in SKY

High frequency breathing activates the sympathetic branch of the autonomic nervous system and probably prepares the brain for increased rapid information processing. Sudarshan Kriya cyclical breathing may disrupt rigid patterns of communication and function within neural networks, the legacy of accumulated stress, for example, unresolved emotional conflicts or trauma-related emotional schemas.

Yogic breathing can be taught to large groups in just a few days and once learnt, it is zero cost with no negative side effects. SKY literature reported that SKY has been used to relieve stress, anxiety, insomnia, depression, and PTSD after mass disasters such as war (Kosovo, Bosnia, Iraq, and Sudan), earthquakes (India 2000), floods (Iran 2004), terrorism (New York 2001), tsunami (Southeast Asia 2004), and hurricanes (Hurricane Katrina, US 2005).

SKY rapidly improves psychological and physiological symptoms of post-traumatic stress, including insomnia, nightmares, anxiety, depression, hyperarousal, over-reactivity to triggers,

re-experiencing, emotional numbing, social withdrawal, loss of appetite, and angry outbursts. Anxiety, depression, and PTSD are associated with sympathetic nervous system (SNS) overactivity or erratic activity and parasympathetic nervous system (PNS) underactivity. Evidence suggests yoga breathing normalizes SNS activity and increases PNS tone as indicated by heart rate variability.

1. SKY Impact on Risk Factors for Juvenile Delinquency

Risk factors for juvenile delinquency and involvements in the criminal justice system include parental abuse, family violence, sexual abuse, trauma, alcohol and other substance abuse, poor educational performance, failure in school, anti-social peers, hyperactivity, aggressiveness and risk-taking behavior. There is substantial scientific evidence that the practice of SKY reduces many of these factors in youth and adults as outlined below.

Multiple studies suggest SKY as a promising adjuvant drug-free treatment option for anxiety and depression. In fact, SKY demonstrates a 68-77% success rate in treating depression and anxiety, with substantial relief documented in 2-3 weeks. SKY is believed to influence the autonomic nervous system (ANS) by activating the parasympathetic "rest and digest" response, which counteracts the body's stress response. Regular practice has been associated with [reduced cortisol levels](#) (the stress hormone), improved heart rate variability, and [increased feelings of calm](#) and relaxation, 3-times improvement in [deep sleep](#), 25% increase in [social-connectedness](#). In a personal communication with University of Alabama researchers on a paper in review, in a randomized control trial of 45 healthy adults of mean age 40, SKY showed a 400% increase in social-connectedness, large effect size increase in self-compassion and reduction in anxiety arousal in just 8 weeks.

Please see, [Annotated Bibliography of Research on SKY in Treatment of Clinical Depression](#).

2. SKY Practice Reduces Aggression, Impulsivity and Violence:

[Newman et al., \(2024\)](#) evaluated the impact of the SKY Schools program, which integrates SKY Breathing, on [79 eighth-graders](#) through a randomized controlled trial. **Results showed significant improvements in emotion regulation, planning, concentration, and reduced distractibility among SKY participants, with sustained benefits in areas like identity formation and aggressive normative beliefs after three months.** The findings suggest that adding physiological calming techniques can enhance the effectiveness of Social-Emotional Learning (SEL) and Positive Youth Development (PYD) programs.

[Newman et al., \(2020\)](#) also evaluated a breath-based biopsychosocial SEL intervention including SKY on [59 high school students](#), assessing self-esteem, identity formation, anger coping ability, planning, concentration, impulsivity, distractibility, and aggression. **Significant improvements were found across all measures, with students showing higher self-esteem, better concentration, improved anger coping, and reduced impulsivity and distractibility after the intervention.** There were no significant differences in outcomes

between genders, and most ethnic groups showed similar benefits, except African American students, who scored lower on emotion regulation measures. **The findings suggest that integrating yoga techniques like Sudarshan Kriya Yoga into SEL programs can improve outcomes across diverse demographics.**

[Ghahremani et al., \(2013\)](#) evaluated the impact of the SKY program for teenagers, called YES!, on impulsivity in high school students. 524 students aged 14-18 participated in the program during physical education classes, while a control group (264 students) followed their usual curriculum. Using the Barratt Impulsiveness Scale, the results showed that YES! participants reported reduced impulsive behaviors compared to the control group. **The findings suggest that SKY can promote mental health and potentially protect adolescents from risky behaviors linked to impulsivity.**

Additional Research, Currently Unpublished:

[Report prepared by Professor John Toumboruron at Deakin University \(2016\)](#) studied the pre-post evaluation of "Yes! for Schools" (now known as the SKY Schools program) at Somerville Secondary College involving 45 students who had higher depressive symptoms and lower social-emotional skills compared to state averages. **Participants experienced significant reductions in depressive symptoms and improvements in coping, emotional control, and problem-solving skills.**

A 2005 study conducted at the Taipei Tu-Chen Detention Centre in Taiwan involving 604 prisoners **found that 86% of participants reported significant reductions in anger following the practice of Sudarshan Kriya Yoga (SKY).** (See [Art of Living Prison Program Research](#).)

A study at Los Angeles County Lancaster Probation Camp showed a **21-38% decrease in incidents such as fights, disciplinary actions, and overall behavioral issues.** These findings suggest that the integration of SKY into prison programs can significantly improve emotional regulation and reduce violence and conflict among inmates. (See [Art of Living Prison Program Research](#).)

3. SKY Helps Reduce Risk of Future Criminality

[Kanchibotla et al., \(2020\)](#) assessed the effects of the SKY program on well-being and behavior among 219 militants from the United Liberation Front of Assam following their surrender. Participants engaged in a 40-day intensive workshop. **Results indicated significant reductions in aggression and improvements in quality of life and life satisfaction suggesting that SKY practices can aid rehabilitation and reduce risk of future criminality in those with a history of extreme violence.**

[Sureka et al., \(2014\)](#) ran a randomized controlled trial aimed to assess the effects of Sudarshan Kriya and related practices (SK&P) on male prisoners with non-psychotic psychiatric disorders. Over six weeks, 230 prisoners were assigned to either the SK&P group or a control group that

practiced simple breathing awareness. **The study found significant improvements in the SK&P group in terms of global functioning (GAF), anxiety (ANX), depressed mood (DEP), positive well-being (PWB), general health (GH), and overall psychological well-being (PGWB). Anxiety and depression levels significantly reduced in the SK&P group compared to the control.** However, changes in self-control (SC) and vitality (VT) were not statistically significant. The results suggest that SK&P can positively affect mental health outcomes for prisoners, reducing anxiety and depression and improving overall well-being.

Ross Deuchar (2019) published an article "[‘I Get More in Contact with My Soul’: Gang Disengagement, Desistance and Role of Spirituality](#)" in Youth Justice, where he explored the links between gangs, masculinity, religion, spirituality and desistance from an international perspective. It presents insights from life history interviews conducted with a small sample of 17 male reforming gang members in Denmark who had become immersed in practicing SKY as part of the Art of Living Prison Program that foregrounded meditation, yoga and dynamic breathing techniques. **Engagement with the program enabled the men to begin to perform broader versions of masculinity, experience improved mental health and well-being and develop a greater commitment to criminal desistance.** Links with religious and spiritual engagement are discussed, and policy implications for the UK gang context included. [Please also read here his entire thesis](#) (2016).

4. SKY Has Significant Effects in Reducing Substance Abuse

[Unudurthi et al., \(2023\)](#) Conducted by Ohio State University, 8 participants with opioid use disorder (OUD) were recruited from an intensive outpatient program and were offered SKY in addition to treatment-as-usual for a 4 week intervention. Participants were asked to practice daily for 30 minutes. **Compared to baseline, there was a significant decrease in substance use cravings (p-value=0.04) and depression (p-value=0.01).** In addition, physical functioning and emotional well-being significantly increased after SKY.

[Dhawan et al., \(2015\)](#) recruited 15 Opioid-dependent users seeking treatment at a clinic of a large hospital that were stabilized on medication for at least 6 weeks. Compared to 14 controls, **the experimental group had significant improvement in their scores on the Addiction Severity Index (ASI) and WHO Quality of Life Scale (WHO QOL-BREF).** They reported that at 3 months and at 6 months, SKY increases Quality of Life in people with OUD. Psychological domain scores measuring positive feelings, cognitions, self-esteem, body image, and negative feelings improved the most, followed by the environment domain which had items of safety and security, home environment, finance, health, social care, etc. The authors used negative urine drug screening ensuring no drug use for all in the study.

[Vedamurthachar et al., \(2006\)](#) In a randomized controlled trial of 60 alcoholics, when learning SKY over a 2-week period following detoxification, there was **significant reduction in BDI scores and significant reductions in plasma cortisol and adrenocorticotrophic hormone.**

[Kochupillai et al., \(2006\)](#) In a study of cancer patients who had completed their standard therapy, researchers have shown that **SKY helped to control the tobacco habit in 21% of individuals who were followed for up to 6 months of SKY practice.**

5. SKY Reduces Symptoms of PTSD

[Seppälä et al., \(2014\)](#) conducted a study on 21 U.S. veterans suffering from PTSD, where participants were taught Sudarshan Kriya Yoga (SKY). The study found that **practicing SKY significantly reduced PTSD symptoms, including hyperarousal and emotional numbing, while improving overall psychological well-being. The veterans also showed a decrease in aggression and stress levels following SKY practice.**

[Bayley et al., \(2022\)](#) compared SKY and cognitive processing therapy (CPT) for treating PTSD in veterans at a Veterans Affairs outpatient center. Of 85 veterans participating, 59 completed the trial. **Both interventions significantly reduced PTSD symptoms, with SKY showing a mean reduction of -5.6 and CPT -6.8 at 6 weeks.** The difference in change scores was within the non-inferiority margin, **confirming SKY was not inferior to CPT.** This non-inferiority was maintained at 1 month and 1 year, although SKY was inferior to CPT in depression and affect measures at 1 year. **Dropout rates were similar (27% for SKY, 34% for CPT),** indicating SKY is a viable alternative to CPT for PTSD treatment.

Another study published in the *Journal of Clinical Psychiatry*, ([Brown & Gerbarg, 2005](#)) reported that **SKY improved symptoms of anxiety, depression, and trauma among PTSD patients after six weeks of practice, with effects comparable to traditional cognitive therapies.**

[Vasudev et al., \(2020\)](#) assessed the feasibility and efficacy of a modified Sudarshan Kriya Yoga (SKY) program as an adjunctive therapy for PTSD, depression, and anxiety on 21 adults. The program consisted of a 6-day intensive training followed by weekly and bimonthly booster sessions, with participants practicing SKY daily at home. **Results showed significant reductions in PTSD symptoms at week 12, which were sustained at week 24, alongside notable improvements in depression and anxiety symptoms,** indicating that SKY could provide lasting benefits without ongoing professional support.

[Descilo et al., \(2010\)](#) studied 183 survivors of the 2004 Indian Ocean tsunami. **Those who practiced Sudarshan Kriya Yoga (SKY) experienced significant reductions in PTSD symptoms and emotional distress. The study concluded that SKY provided trauma survivors with better emotional regulation, lessening the impact of trauma on their mental health and reducing aggressive tendencies linked to trauma.**

[Kjellgren et al., \(2007\)](#) studied the impact of SKY on 55 individuals with chronic stress and found **significant improvements in emotional balance and reduced aggression. The study noted that SKY improved heart rate variability, a key marker for emotional control and stress reduction.**

See this [Art of Living website with additional research on SKY's impact on PTSD.](#)