

Research

Transformative Life Skills: Pilot Studies of a Yoga Model for Reducing Perceived Stress and Improving Self-Control in Vulnerable Youth

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Abstract: *Two pilot studies demonstrate that a comprehensive multimodality intervention of Transformative Life Skills (TLS) consisting of Yoga poses (asana), breathing techniques (pranayama), and meditation (dhyana) can reduce perceived stress and increase self-control and self-awareness in at-risk and incarcerated youth. As part of a countywide violence prevention effort, Niroga Institute conducted daily 60-minute TLS programs at Alameda County Juvenile Justice Center (ACJJC). Additionally, a condensed 15-minute TLS protocol was implemented at El Cerrito High School, a large urban public high school. The effectiveness of TLS was evaluated using the Perceived Stress Scale (PSS-10) and Tangney's Self-Control Scale (TSCS-13). Statistical analyses indicate a significant improvement in stress resilience, self-control, and self-awareness among the youth exposed to Niroga's TLS protocols. These results have substantial relevance to education and community-wide violence prevention.*

Keywords: *Yoga, meditation, mindfulness, pranayama, adolescents, incarceration, violence, stress, self-control*

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Niroga's Pilot Programs: Yoga-Based Transformative Life Skills

Niroga Institute is a nonprofit organization that seeks to foster health and well-being and prevent violence in at-risk and underserved individuals, families, and communities through outreach, education, and research. Every year, Niroga brings Transformative Life Skills (TLS) to thousands of children and youth who are abused, neglected, homeless, delinquent, or incarcerated. TLS is a multimodality intervention consisting of Yoga poses, breathing techniques, and meditation. Niroga's TLS programs are aimed at reducing stress and improving self-control and self-awareness in youth incarcerated in juvenile halls. By focusing on the core problems at the individual level, Niroga aims to reduce the num-

ber of recurrences of violent and criminal behavior and thus have a positive impact on future generations. In addition to delivering direct services to incarcerated youth, Niroga

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provides training sessions for institutional staff in probation and guidance, juvenile court, and local school teachers and administrative staff.

Niroga conducted two pilot studies of its TLS programs: one with incarcerated youth in Juvenile Halls and the second with at-risk youth in urban and alternative high schools. The purpose of these studies was to examine the programs' effectiveness, generate awareness, continue to build partnerships, and lay the groundwork for a scalable rollout throughout Alameda County and other neighboring counties.

The Importance of Helping Incarcerated and At-Risk Youth

The United States incarcerates more of its youth than any other country in the world through its juvenile courts and the adult criminal justice system.¹ The census data of juveniles in public and private residential custody facilities compiled by the National Center for Juvenile Justice for OJJDP indicate that on average, 100,000 juveniles are being held at detention facilities every year in the United States. The state of California holds more than 17% of all incarcerated youth, which is significantly higher than any other state in the country.²

Studies indicate that incarcerating young offenders is not the most effective way of curbing delinquency and reducing crime. According to a report published by the Justice Policy Institute, youth incarceration harms emotional, mental, and social development and has counterproductive effects on communities.³ The act of incarcerating high numbers of youth seems to facilitate increased crime by aggravating the recidivism of detained youth. In 1999, Wisconsin state's Joint Legislative Audit Committee conducted an evaluation of four counties and reported that 70% of youth held in secure detention were arrested or returned to secure detention within one year of release.⁴ The researchers reported, "Placement in secure detention may deter a small proportion of juveniles from future criminal activity, although they do not deter most juveniles." The separation from family and community, and the congregation of offenders, make previous incarceration the leading indicator for a repeat offense among young offenders.

In a cost-benefit analysis, the effectiveness of detention and incarceration scores very low compared with alternative approaches to youth delinquency. In 2002, a study conducted by Washington state revealed that for every \$1 spent on juvenile detention systems, the cost-benefit return was about \$2 in terms of reduced crime and cost of crime to taxpayers.⁵ For a series of alternative programs, such as

functional family therapy, a mentoring program, aggression replacement training, and boot camp with cognitive behavioral treatment, the cost-benefit returns were significantly higher, in the range of \$3.36 to \$50. This study indicates that alternative models are economically and socially more effective in reducing youth offenders. One of the concluding recommendations of this report is to "identify specific research-proven programs that save more money than they cost." It is Niroga's goal to do so.

It is also important to support youth who are not incarcerated but are at risk of dropping out of school. The state of California has the highest number of high school dropouts in the United States.⁶ According to the California Dropout Research Project, a 50% reduction in dropouts statewide could save \$12 billion and prevent nearly 14,000 criminal acts.⁶ In Oakland, where Niroga Institute is located, the estimated lifetime community costs associated with a single year's permanent dropouts is \$288 million. It has also been estimated that a 50% reduction in the number of permanent dropouts could cut the number of homicides and assaults by 22% in Oakland.⁷ For this reason, Niroga has begun to offer its TLS programs in schools to help prevent dropouts and reduce violence in local communities.

Pilot Program I: TLS in Juvenile Halls

Study Overview

Since 2006, Niroga has been offering daily 60-minute TLS programs at the Alameda County Juvenile Justice Center (ACJJC). This pilot study evaluated the effectiveness of TLS on program participants' perceived stress and self-control.

Participants

Niroga Institute offers 27 classes per week to incarcerated youth in several units at ACJJC and a weekly class for ACJJC staff. For this pilot study, the data collected from Unit 6 (formerly known as B2) of ACJJC between June 2008 and December 2009 was examined. Throughout the 18 months of program delivery, a total of 217 residents participated in the TLS program. The average attendance was 22.55 total sessions (SD = 15.72; range = 1 to 69; mode = 12). Although a total of 217 residents participated in at least one program session throughout the 18 months of program delivery, pre- and post-test perceived stress data were obtained from only 75 residents (35%) and pre- and post-test self-control data were obtained from only 70 residents (32%). Although all participants reported their gender, only 16% reported their age, and 12% reported their race/ethnicity. Based on these

data, the sample was composed of slightly more young women (56%) than young men (44%), and, although very limited, the data concerning age and ethnicity suggest that the majority of residents were between the ages of 16 and 17 (65%) and of African American (73.1%) ethnicity. This is consistent with the typical ethnic demographics at ACJJC. According to a report prepared by Huskey & Associates for ACJJC, over 60% of all admissions to the Juvenile Hall during 2000–2003 were African American youth.⁸

Intervention Description

Program classes were provided within the unit five days per week (Monday through Friday), with one girls' and one boys' class per day. Sessions involved the following components: an initial moment of silence (centering), a "check in," a sequence of Yoga poses and breathing exercises, and a final "check out." (An outline of a typical 60-minute TLS session offered at ACJJC is shown in Appendix 1.) The sequence is designed to facilitate stress management and healing from trauma, with the following benefits in mind:

- **Physical:** strength, flexibility, balance, and relaxation
- **Emotional:** self-regulation, coping skills, and empathy
- **Intellectual:** focus, attention, engagement, decision-making skills, healthy lifestyle choices
- **Social:** interconnectedness and interdependence

Niroga Staff

Niroga teachers are certified Yoga teachers who undergo additional multiday trainings to join the Yoga Corps and effectively serve vulnerable populations. These teachers are trained to create a safe yet effective practice for participants with short attention spans and a learning environment that is often chaotic and unpredictable. Niroga teachers regularly come together to discuss their field experience and develop best practices, continue to collectively evolve the protocols that are optimal for our target population, and document these for the Niroga Institute and for others working in this field.

Measures

The effectiveness of the TLS program on stress reduction and self-control was assessed using the Perceived Stress Scale (PSS-10)⁹⁻¹⁰ and Tangney's Self-Control Scale (TSCS-13)¹¹. The PSS-10 is a validated 10-item self-report questionnaire used to assess the level of stress experienced in the previous month. Participants indicate responses to all 10 items on a 5-point scale ranging from 1 (never) to 5 (very often). Scores range from 10 to 50, with higher scores indicating greater perceived stress. The TSCS-13 is a validated 13-item

self-report questionnaire that assesses the level of self-control experienced in the previous month. Participants indicate responses to all 13 items on a 5-point scale ranging from 1 (never) to 5 (very often). Scores range from 13 to 65, with higher scores indicating greater levels of self-control. In this study, the PSS-10 and TSCS-13 demonstrated acceptable reliability: Cronbach's alpha averaged 0.75 on the PSS-10 and 0.745 on the TSCS-135.

In addition to the self-report questionnaires noted above, qualitative data were obtained from program staff in the form of field notes/reflections. These were primarily collected to provide additional understanding and program feedback, but relevant comments are included in the discussion below.

Data Collection

Data collection was conducted by the behavioral health/guidance clinic staff at ACJJC, in addition to Niroga staff members, throughout the study, to include baseline (pre-test), weekly, and post-test data. Clinic staff coordinated and administered the PSS-10 and TSCS-13 at baseline and post-test, while Niroga staff requested that all participants complete a weekly 4-point questionnaire, in order to assess a possible shift in perceived stress on a more regular basis. As will be noted later, there were significant challenges associated with data collection. For example, participants were often transferred to other facilities at times when guidance staff was unavailable to complete the post-test. In addition, many participants were unwilling to complete the weekly assessments.

Results

For this current study, PSS-10 and TSCS-13 data collection began in June 2008 and was completed in December 2009. Paired samples *t*-tests were conducted to assess changes in pre- to post-test scores on perceived stress and self-control.

Perceived Stress: A paired samples *t*-test of PSS-10 scores revealed a statistically significant decrease ($t = 2.061$, $p = .04$) in perceived stress from pre-test (mean = 32.59, SD = 6.1) to post-test (mean = 31.28, SD = 5.4).

Self-Control: A paired samples *t*-test of TSCS-13 scores revealed a significant increase in self-control ($t = -2.3$, $p = .02$) from pre-test (mean = 36.99, SD = 6.38) to post-test (mean = 38.67, SD = 5.19) among participants.

Discussion

These findings suggest that the delivery of a TLS program within Juvenile Hall among predominantly African

American males and females between the ages of 12 and 17 may decrease perceived stress and increase self-control. The observed changes were small (less than 2 points on scales with a potential 40-point range), but statistically significant.

These statistical shifts were complemented by the qualitative data provided by Niroga staff, suggesting that program participation facilitated residents' ability to "resolve conflict in more adaptive ways" and "improve self-awareness." The staff reported using the metaphor "stay on your own mat" throughout the day to remind the minors to stay focused on themselves by staying out of each other's "business." The staff and residents also use "Yoga language" through the day in their therapy groups. The minors in Unit 6 have a positive association with Yoga class and recognize it as a place where they can experience a feeling of well-being. According to staff, several minors from Unit 6 have really taken to the practice of Yoga and have, through Yoga, demonstrated strong leadership capabilities. The Yoga sessions provide an opportunity to nourish the leadership qualities of the youth by allowing them to lead portions of the class.

There are several limitations to this pilot study, most notably the lack of a control group and the difficulty collecting pre- and post-data from program participants. Data-collection challenges included the participants' general resistance to completing the instruments and having to rely on ACJJC staff to collect data. A high percentage of the residents had diagnosed mental health disorders, and various situational, personal, and emotional crises would frequently interfere with the ability of Niroga teachers to conduct sessions successfully.

Despite these limitations, this pilot study suggests that a Yoga-based program is an acceptable intervention within a Juvenile Justice center and that participation in such a program may have a positive effect on perceived stress and self-control and/or prevent incarceration-related increases in stress and deterioration of self-control.

Pilot Program II: TLS in Urban Schools

Program Overview

Niroga offered a condensed 15-minute TLS protocol at El Cerrito High School (ECHS), a large urban public high school in West Contra Costa Unified School District in California. El Cerrito High School's profile of students by race is 35.6% African American, 23.7% Hispanic, 17.2% Asian, 16.7% Caucasian, and 2.5% Filipino. Over one third of students come from families with a low enough income to qualify for free or reduced-price lunches under the National School Lunch Act. This pilot

study evaluates the effects of an 18-week TLS program on student perceived stress and self-control, in comparison to a no-intervention control condition.

Participants

Niroga's TLS program was delivered at ECHS during the fall 2008 semester for a total of 18 weeks. A total of Fifteen classrooms (totaling 472 students) were chosen for the intervention. In addition, three classrooms with 85 students were selected to serve as a control group that did not receive the TLS protocol. The control group consisted of 61.2% males and 38.8% females, while the intervention group consisted of 48.8% males and 51.2% females. Among the intervention group, 12.5% received one class per week, 24.1% received two classes per week, 35.2% received three classes per week, and 12.5% received five classes per week. The percentage of population receiving three, two, or one class(es) per week were not assigned, but determined from student attendance.

Intervention Description

The 15-minute TLS protocol included an opening bell, focused breathing (*pranayama*), silent sitting meditation, sun salutations, a "pose of the day" (*asana*), rhythmic breathing, silent sitting, and a closing bell. These sessions were conducted by a different, but similarly trained, team of Niroga staff than that of the ACJJC pilot study.

Measures

As in the first pilot study, the PSS-10 and TSCS-13 were used to assess the program's effects on perceived stress and self-control. Self-reported data was collected at three time-points: pre-intervention, the mid-point of the intervention, and post-intervention. Table 1 shows the Cronbach's Alpha and number of valid responses collected at each timepoint.

Results

T-tests and ANOVA were used to explore differences between and within intervention and control students' self-control and perceived stress.

	Pre-test		Mid-test		Post-test	
	N	Alpha	N	Alpha	N	Alpha
PSS10	413	0.78	337	0.84	387	0.87
TSCS13	410	0.82	***	***	377	0.83

Table 1. Response data for PSS-10 and TSCS-13 (N represents the number of valid cases and *** = scale not utilized during this data collection).

Perceived Stress: We first examined changes in stress among the intervention group. Paired sample *t*-tests conducted for the intervention group yielded several significant differences. Pre-intervention stress scores were significantly greater ($t = 2.985, p = .003$) than mid-intervention stress scores; mid-intervention stress scores were significantly greater ($t = 2.029, p = .044$) than post-intervention stress scores; and, finally, pre-intervention stress scores were significantly greater ($t = 3.124, p = .002$) than post-intervention stress scores. Therefore, the data demonstrate a small but statistically significant downward trend in stress within the intervention group, from a pre-intervention mean perceived-stress score of 29.9 (SD = 6.8), to a mid-intervention mean perceived-stress score of 28.95 (SD = 5.96), to a post-intervention mean perceived-stress score of 28.57 (SD = 6.32).

In contrast, paired sample *t*-tests conducted for the control group yielded no statistically significant differences between pre- and post-test perceived stress scores ($t = -.983, p = .332$). A midpoint perceived stress score for the control group was not available.

Within the intervention group, we conducted a one-way ANOVA to determine whether number of classes influenced changes in stress. There were no significant pre-intervention differences in perceived stress among the groups receiving one, two, three, or five classes per week. In contrast, significant differences were observed for mid-intervention stress ($F = 3.088, p = .03$) and post-intervention stress ($F = 2.633, p = .05$). At both the mid point and the end of the intervention, greater reductions in stress scores were noted for those receiving five classes as compared to three, two, or one class(es) per week.

Self-Control: A paired samples *t*-test showed that there was no significant change ($t = -.34, p = .74$) in self-control scores within the intervention group from pre-test (mean = 40.63, SD = 8.1) to post-test (mean = 40.76, SD = 7.8). A paired sample *t*-test conducted for the control group revealed no significant changes in self-control ($t = 1.269, p = .213$). However, there was a nonsignificant observed decrease in self-control from pre-test (mean = 40.44, SD = 7.2) to post-test (mean = 37.6, SD = 7.89). Midpoint self-control scores were not available for the control and intervention group.

Within the intervention group, we examined via a one-way ANOVA whether number of classes influenced changes in self-control. There were no pre-intervention differences in self-control among the groups receiving one, two, three, or five classes per week ($F = .52, p = .67$). There were also no significant differences between the number of classes delivered and post-test self-control scores ($F = 2.09, p = .10$).

Discussion

Over the course of the 18-week TLS program, the intervention group demonstrated a slight decrease in stress and maintenance in self-control. In contrast, the control group, which received no classes, demonstrated no significant change in stress, and a non-significant trend toward deterioration of self-control. It is reasonable to hypothesize, therefore, that the TLS program might help at-risk high school students become more resilient to stress and protect against stress-related deterioration of self-control.

In addition, we received qualitative feedback from students indicating that the TLS program helped them to “calm down,” “reduce stress,” and “focus.” Teacher feedback reported that the program was easily “adapted to the classroom environment” and helped them feel more “calm” and “relaxed.”

This pilot study suggests that a short but frequently applied Transformative Life Skills (TLS) protocol in the classroom—a multimodality intervention integrating Yoga, breathing techniques and mindfulness—can decrease perceived stress and increase self-control in high school students. Additionally, training school teachers and institutional staff in these same interventions should help with their stress management, resilience, and ability to function from a more optimal state.

Concluding Remarks

Combined, these two pilot studies provide promising evidence that a Yoga-based program can produce positive transformation in vulnerable youth. The long-term beneficial outcomes of such a program, if widely implemented, range from reductions in juvenile crime, violence, and high school dropout rates, to long-term improvements in education, public health, economic growth, and community development.

Given the very high societal cost of crime and violence, high school dropouts, and juvenile and adult incarceration, the potential social return on investment for Yoga-based interventions is substantial. These pilot studies point to the urgent need for additional research and programs in this area to determine the impact of such Yoga-based interventions. In education, for example, we need to investigate the impact of these interventions on school attendance, behavior, grades, and dropout rate. Similarly, in juvenile justice, we need to see if Yoga-based interventions can reduce juvenile crime and lower recidivism rates. To establish these societal connections, we will need to bring these pilots to scale and reach enough children and youth (critical mass) enough times (sufficient dosage) to enable the discovery of potential tipping points for social transformation.

References

1. Office of Juvenile Justice and Delinquency Prevention; U.S. Department of Justice. <http://www.ojjdp.ncjrs.gov>. Accessed June 13, 2010.
2. Sickmund M, Sladky TJ, Kang W. *Census of Juveniles in Residential Placement Databook*. Washington, DC: U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention; 2008. <http://ojjdp.ncjrs.gov/ojstatbb/cjrp/>. Accessed June 28, 2010.
3. Holman B, Ziedenburg J. *The Dangers of Detention: The Impact of Incarcerating Youth in Detention and Other Secure Facilities*. Washington, DC: Justice Policy Institute; 2006.
4. Bezruki D, Varana D, Hill C. *An Evaluation of Secure Juvenile Detention*. Madison WI: Legislative Audit Bureau; 1999.
5. Aos S. *The Juvenile Justice System in Washington State: Recommendations to Improve Cost-Effectiveness*. Olympia, WA: Washington State Institute for Public Policy; 2002.
6. California Dropout Research Project. *Dropout Crisis Contributes to Substantial Economic Losses in California Cities*. Santa Barbara, CA: University of California. April 9, 2009.
7. California Dropout Research Project. *How California's dropout crisis affects communities: Economic Losses for the City of Oakland*. Santa Barbara, CA: University of California. April 9, 2009.
8. *Huskey Report*. Alameda County Probation Department. Alameda County, CA. <http://www.acgov.org/probation>. Accessed June 13, 2010.
9. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of Health and Social Behavior*. 1983; 24:385-396.
10. Tagny JP, Baumesiter RF, Boone AL. High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*. 2004; 72(2):271-324.

Appendix 1. Sample Outline of 60-Minute Transformative Life Skills Program.

All Yoga poses are chosen to address common chronic conditions and are adapted to varying levels of ability.

Centering

- Moving from thoracic breathing to rhythmic abdominal breathing
- Chant *Aum* 4 times, then *Aum Shanti*

Warm-Up Postures

- Supine hip raise
- Supine leg raise
- Alternate knee-to-chest movement
- Abdominal curls
- Abdominal twists
- Sitting forward-bend movement
- Prone boat
- Cat stretches
- Cat to downward dog movement

Standing Postures

- Vertical trunk-twisting movement
- Shoulder movements
- Neck movements
- Standing side bend
- Rhythmic thoracic breathing
- Eagle, tree, or dancer's pose
- Chair pose
- Side warrior

Seated/Reclining Postures

- Sitting spinal twist
- One-legged abdominal twist

Closing

- *Savasana* (relaxation) meditation for five minutes
- Chant *Aum* 4 times, then *Aum Shanti*