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Evaluation of the Benefits of a Kripalu Yoga Program for Police Academy Trainees: A Pilot Study

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Abstract

Background: Law enforcement ranks as one of the most stressful occupations in the world. Yoga is a mind–body practice composed of postures, breathing, and meditation techniques, and is known for its beneficial effects on stress and mood disturbance. **Objectives:** This pilot study evaluated the effects of Kripalu yoga on perceived stress, mood, and mindfulness during police academy training. **Method:** Forty-two recruits participated in a 6-class yoga intervention. Participants completed the Profile of Mood States-Short Form, Perceived Stress Scale, and the Five Facet Mindfulness Questionnaire prior to and immediately following completion of the yoga program, as well as an exit survey. **Results:** Paired samples *t*-tests revealed significant postintervention changes in perceived stress and mood, reductions in tension and fatigue, and a trend toward reduced anger. Changes in mindfulness were not detected. The exit survey indicated perceived benefits of yoga for some participants. **Conclusions:** This preliminary study suggests that yoga may be beneficial for reducing stress, tension, and fatigue among police academy trainees. Future longitudinal randomized controlled trials are needed to evaluate its full potential as a permanent component of police academy training.

Key Words: police, recruit training, yoga, stress, mood, mindfulness

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Law enforcement is a highly stressful profession (Violanti & Aron, 1993). Police officers face occupational stressors ranging from routine organizational or administrative duties to life-threatening critical incidents (Brown & Campbell, 1990; Collins & Gibbs, 2003; Gershon, Barocas, & Canton, 2009; Hickman, Fricas, & Strom, 2011). Critical incidents are events that occur in the line of duty and include death threats, injuries, shooting incidents, and child deaths, all of which are likely to evoke intense emotional responses (Kitaeff, 2011). Routine work demands account for greater levels of perceived chronic stress among police officers than do acute stressors or critical incidents (Brown & Campbell, 1990). The chronic stress experienced by members of the law enforcement community is associated with depression (Wang et al., 2010), cardiovascular disease (Brown & Campbell, 1990; Collins & Gibbs, 2003), intimate partner abuse or hyperaggression (Gershon et al., 2009),

alcohol addiction and abuse (Kohan & O'Connor, 2002; Violanti, Marshall, & Howe, 1985), and suicide (McCafferty, McCafferty, & McCafferty, 1992). Consequently, programs are needed that help mitigate the effects of stress for law enforcement personnel.

This pilot study used a pre–post design to examine whether participation in a Kripalu yoga program would reduce stress, tension, and fatigue; improve mood; and increase mindfulness among trainees. We hypothesized that participants would demonstrate pre- to postintervention reductions in perceived stress and related symptoms and demonstrate improved mood and increased mindful awareness immediately following the yoga intervention.

Law Enforcement and Stress

Five domains of occupational stress have been identified that are above and beyond those experienced during critical incidents (Crank & Caldero, 1991). They include interactions within the organization, navigating the judicial system, the task environment, personal or family concerns, and dealing with city government (Crank & Caldero, 1991). The most frequently cited source of work stress involved relationships with superior officers or upper management, rotating shift work and its impact on family and social life, and limited opportunity for advancement. The task environment was the second-highest reported source of stress. Negative interactions with citizens and frustration while dealing with the judiciary system were also noted as significant sources of work-related tension (Crank & Caldero, 1991).

Police officers are found to be 6 times more psychologically distressed from routine occupational stressors, such as administrative, organizational, and bureaucratic-related activities, than from acute events or critical incidents (Brown & Campbell, 1990; Collins & Gibbs, 2003; Violanti & Aron, 1993). In a study of routine work stressors, frustration, and satisfaction among police officers, Liberman and colleagues (2002) developed the 68-item Work Environment Inventory (WEI) based on extant measures and conversations with law enforcement personnel and administrators. Items were worded as generically as possible, with the exception of 15 items that used police-specific language. Respondents endorsed items such as *I am not paid enough for what I do* and *I am happy with the assignments I receive*. Items describing critical incidents were excluded. A separate scale was developed to determine if critical incidents are attributable to psychological distress.

The WEI was completed by 733 officers. The generic, work-related, and police-specific items in the WEI were correlated ($r = 0.68$), suggesting that some aspects of routine work

stress were similar to those found in other occupations and were not related to stress from critical incidents. As corroborated by other reports (Brown & Campbell, 1990; Collins & Gibbs, 2003; Violanti & Aron, 1993), routine occupational stress placed police officers at greater risk for psychological distress independent of critical incidents and more than the cumulative effect of critical incidents alone (Lieberman et al., 2002). Those who experienced greater perceived work stress were also at greater risk for posttraumatic stress symptoms, such as emotional avoidance, feelings of numbness, difficulty concentrating, or difficulty falling asleep, after experiencing a critical incident (Lieberman et al., 2002).

Stress itself is not necessarily harmful; however, the inability to cope with day-to-day exposure to occupational stressors places law enforcement personnel at risk for a number of negative outcomes. Very little training in positive coping strategies, stress management, or resiliency enhancement is offered during police academy recruit training (Executive Office of Public Safety and Security, 2011). Basic training curricula include modules such as problem solving, community policing, ethics and integrity, emergency medical services, criminal law and procedures, investigation, traffic enforcement, and firearms training (Executive Office of Public Safety and Security, 2011). Health and fitness training typically includes, but is not limited to, running, weight training, and circuit training. In some cases, police recruits are subjected to high-stress training that is intended to develop strict discipline (Violanti, 1992; Violanti & Aron, 1993).

When assessed for their ability to cope with physical and mental stressors during high-stress training, recruits reporting greater stress were likely to rely on maladaptive coping strategies, such as escape-avoidance and distancing (Violanti, 1993). Some recruits reported “avoiding being around people in general” and an increased use of alcohol and drugs to help themselves feel better. High levels of perceived work stress and negative or avoidant coping mechanisms were related to adverse outcomes (e.g., depression, partner abuse) and are highly correlated (Gershon et al., 2009). Police recruit training aimed at improving coping and resilience might result in improved health outcomes (Ranta, 2009; Ranta & Sud, 2008; Williams, Ciarrochi, & Deane, 2010).

Exercise and fitness training is believed to counteract police officer stress (Gerber, Kellmann, Hartmann, & Puehse, 2010). A survey of 852 officers in Australia suggested that law enforcement personnel who work long hours tend to engage in unhealthy lifestyle behaviors and exercise infrequently (Richmond, Wodak, Kehoe, & Heather, 1998). Police officers may be less fit than half of all U.S. citizens, even though fitness is a job prerequisite (Quigley, 2008). It is possible that failure to remain physically fit is tied to demanding work hours; for example, it is not uncommon for new officers to be placed on the midnight shift.

Law enforcement personnel may benefit from using coping strategies targeted at stress management that are accessible and easy to implement (Gore, 2003). Simple yogic breathing tech-

niques performed while on patrol may enable officers to respond from a place of calm and may increase their resilience to stressors in the field (Brown & Gerbarg, 2005; Miller, 1991; Ranta, 2009).

Yoga as an Intervention

Yoga integrates the use of physical postures and movement, breathing techniques, deep relaxation, and meditation to cultivate mind-body awareness and mindfulness. These strategies are found to promote mental, emotional, and physical fitness and well-being (NIH, NCCAM, 2012). Yoga has been shown to reduce symptoms of stress (Chong, Tsunaka, Tsang, Chan, & Cheung, 2011; Parshad, 2004), anxiety (Kirkwood, Rampes, Tuffrey, Richardson, & Pilkington, 2005), and depression (Pilkington, Kirkwood, Rampes, & Richardson, 2005), and may offer effective coping strategies for managing stress and lead to improved resilience (Ranta, 2009; Van Puymbroeck, Payne, & Hsieh, 2007).

Mindfulness practices consisting of self-awareness and acceptance cultivate an awareness of muscular movements, postural alignment, mental states, and breath (Lavretsky, 2009). Ideally, yoga and mindfulness techniques are learned from qualified instructors and are supported in a class environment. However, basic relaxation techniques, such as a body scan and focusing on the breath, are context independent and can be practiced anywhere, making them accessible and practical.

Williams et al. (2010) posited that mindful awareness and acceptance provide an alternative to maladaptive, avoidant coping strategies. Researchers who examined whether use of acceptance or avoidance strategies at the time of recruit training predicted well-being 1 year after the onset of active duty found that lack of mindfulness or emotional awareness predicted depression at follow-up. A review of 12 studies (8 randomized, controlled trials) that compared the effects of yoga to those of exercise found that in healthy and in clinical populations, persons practicing yoga fared the same as or significantly better than non-yoga practitioners in terms of health-related measures, such as improved quality of life and stress (Ross & Thomas, 2010). Yoga provides the added benefit of promoting mindful awareness (Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich, 2004; Jeter, Dagnelie, Khalsa, Haaz, & Bittner, 2012; Shelov, Suchday, & Friedberg, 2009) and improving coping and resilience strategies (Hartfiel, Havenhand, Khalsa, Clarke, & Krayner, 2011; Van Puymbroeck et al., 2007).

Few studies have examined whether yoga practices can reduce stress, improve mood, and increase mindful awareness in police academy trainees. This study used a pre-post design to examine whether participation in a Kripalu yoga program would reduce stress, tension, and fatigue; improve mood; and increase mindfulness among trainees. We hypothesized that participants would demonstrate pre- to postintervention reductions in perceived stress and related symptoms and demonstrate improved mood and increased mindful awareness immediately following the yoga intervention.

Method

Participants

Participants were cadet trainees enrolled in a comprehensive 800-hour, 20-week police academy training program conducted in Springfield, Massachusetts. The program was divided between classroom instruction and hands-on training to develop the required knowledge, skills, and abilities for police work (Executive Office of Public Safety and Security, 2011). Acceptance into the program requires that recruits pass a civil service test, background check, and medical, psychological, and agility tests. Forty-two cadet trainees (39 male) who were enrolled in the police academy training program were recruited for the study, and all agreed to participate. They were given the choice to engage in the study either after training activities were completed or be dismissed for the day during the course of training. The police commissioner and the directors of the police academy approved a human subjects research protocol and provided ethical oversight.

Informed consent was obtained from all study participants. The consent form clearly stated that confidentiality was ensured, participation was strictly voluntary, no compensation would be offered, and that individuals who refused to participate or dropped out would not be penalized. They were also informed that the study posed minimal risk, and participants were free to refuse to respond to any or all questionnaire items. The yoga instructor administered consent forms, and responses were kept confidential. These procedures minimized the potential influence of group pressure or coercion.

The 42 police academy cadets enrolled in the six-class yoga program as part of the basic police-training curriculum. Mean age was 28.29 (±4.57) years, and the sample was ethnically diverse (64% White, 24% Hispanic, 7% Black, and 5% Asian). Two male cadets were dismissed from the police academy during the program because of medical reasons and academic failure. An additional male cadet did not attend the final day and did not complete the postintervention assessment, resulting in data from 39 cadets included in the final analysis. Class attendance for 40 cadets was 99.2%.

Yoga Intervention

The yoga intervention consisted of six 75-minute classes held during the 20-week police academy training. Because of scheduling constraints, the first class was held during Week 6 of training and the second was held 3 weeks later during Week 9. Classes 3 and 4 were held during Week 10 and Classes 5 and 6 were held during Week 11. The six classes were held during a noncontinuous 4-week period. All but the final yoga class occurred following rigorous physical police-training sessions.

Classes were taught in the Kripalu yoga tradition, which emphasizes conscious awareness, breathing exercises, yoga postures, deep relaxation, and meditation (e.g., noticing the breath, drawing attention inward). Postures focused on developing strength and flexibility and included standing and balancing, forward and backward bending, spinal twists, and lateral bends (see Table 1 for details). Postures were performed standing, sitting, and lying on the floor. Trainees were taught breath aware-

ness techniques that could help them manage stress outside the classroom. The yoga instructor was a retired detective lieutenant from the Massachusetts State Police and a certified Kripalu yoga instructor. Police cadet instructors and police academy staff were excluded from yoga classes to create a more relaxed and comfortable atmosphere for recruits.

Table 1
Kripalu Yoga Sequence

5 mins	Centering and meditation
	Breathing, which included deep belly breathing and counting breaths.
15 mins	Warm-up
	Included a joint-freeing series such as neck and shoulder rolls, six movements of the spine (front, back, side to side, right and left twists), cat and cow stretch, ankle and feet circles, lazy frog, pigeon, and downward facing dog poses.
25 mins	Standing poses
	Included <i>Ardha Uttanasana</i> (standing half forward bend), <i>Padangusthasana</i> (big toe pose), <i>Prasarita Padottanasana</i> (wide-legged forward bend), <i>Parsvottanasana</i> (intense side stretch pose), <i>Ardha Chandrasana</i> (half moon pose), and <i>Vrksasana</i> (tree pose).
15 mins	Supine or seated poses
	<i>Supta Matsyendrasana</i> (supine spinal twist), knee down spinal twist, <i>Pavanmuktasana</i> (wind reliever pose), and <i>Setu Bandha Sarvangasana</i> (bridge pose)
15 mins	Restorative
	Guided relaxation: softening from face to toes or toes to face (body scan) and <i>Sivasana</i> .

Outcome Measures

The primary outcome measures included the following:

Profile of Mood States-Short Form (POMS-SF; Curran, Andrykowski, & Studts, 1995). This self-report questionnaire provides a global Total Mood Disturbance score and six affective dimension subscales: Tension/Anxiety, Depression/Dejection, Anger/Hostility, Vigor/Activity, Fatigue/Inertia, and Confusion/Bewilderment. The 30 items are used to measure affective mood states during the past week, including today, on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*); Cronbach's $\alpha = 0.80-0.91$.

Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). This 10-item scale measures perceived stress during the past month on a 5-point Likert scale ranging from 0 (*never*) to 4 (*very often*). The self-report questionnaire has been validated for clinical and nonclinical populations, and its internal consistency is well established: Cronbach's $\alpha = 0.85$ (Baer et al., 2008; Gaylord, Palsson, & Garland, 2011; Labott, Ahleman, Wolever, & Martin, 1990; Leung, Lam, & Chan, 2010).

Five Facet Mindfulness Questionnaire (FFMQ; Baer, www.IAYT.org

Smith, Hopkins, Krietemeyer, & Toney, 2006). The 39-item FFMQ includes a global mindfulness score and five subscales representing five distinct facets of mindfulness: Observing, Describing, Awareness, Nonjudging, and Non reacting; Cronbach's $\alpha = 0.85$.

Following the intervention, cadets completed an evaluation of the yoga program that included questions developed by the study team. Participants were asked to indicate how strongly they felt about 10 questions by using a visual analogue scale (VAS) ranging from 0 (*not at all*) to 10 (*very much so*). The continuous scale of the VAS has been shown to capture subjective phenomena more accurately than does a discrete scale (Aitken, 1969; Gift, 1989). Sample questions include, *Did you find the yoga program beneficial for you in general?* and *Did you find the practice of meditation in the classes beneficial?* In addition, one final question provided an opportunity for the respondents to describe their experience of the program in an open-ended format.

All questionnaires were administered before the first class and immediately after the last class. An evaluation questionnaire was administered after all cadets completed the yoga program.

Results

A paired samples *t*-test was conducted to compare pre- and postintervention mean-level differences for the POMS, PSS, and FFMQ scales and subscales (Table 2). Scaled scores were normally distributed, suggesting that use of a paired samples *t*-test was appropriate. Significant pre- to postintervention differences were observed for the POMS global score, $t(38) = 3.78, p = 0.001$, and the PSS, $t(38) = 2.31, p = 0.03$, indicating a reduction in perceived stress and overall mood disturbance. Statistically significant improvements were found for the Tension/Anxiety and Fatigue/Inertia POMS subscales, $t(38) = 6.69, p = 0.000$ and $t(38) = 2.29, p = 0.028$, respectively. A trend for improvement in the Anger/Hostility POMS subscale, $t(38) =$

1.88, $p = 0.067$, was also detected. No significant differences over time were found for the Depression/Dejection, Vigor/Activity, or Confusion/Bewilderment POMS subscales or the FFMQ mindfulness scores, with the exception of a marginal trend for the FFMQ-Observing subscale ($p = 0.10$).

Cadets' ratings of the yoga intervention revealed the program to be moderately beneficial overall ($M = 5.4, SD = 2.8$) and specific to the focus of their training ($M = 5.2, SD = 2.9$). A subset of the questions (Questions 1-3) pertaining to perceived benefit is displayed in a histogram in Figure 1 to demonstrate the distribution of responses for 39 cadets. Although they found the three main components of the yoga practice (physical postures, meditation, and breathing exercises) beneficial (*Mean range = 5.6-6.4, respective SD range = 3.3-2.4*), they were only slightly more likely to continue the physical and breathing exercises ($M = 5.4, SD = 3.2$ and $M = 5.4, SD = 3.3$, respectively) than the meditation practice in the future ($M = 4.8, SD = 3.1$) or as a result of the program in general ($M = 3.8, SD = 2.9$). Open-ended comments revealed that 5 of 24 cadets found the program beneficial, relaxing, and stress relieving; however, 5 indicated they were resistant to the program because they felt that yoga was inconsistent with typical paramilitary police training.

Discussion

Results of this preliminary study suggest that participation in the yoga intervention was associated with improvements in cadets' perceived stress and mood. Total mood disturbance, tension/anxiety, and fatigue/inertia decreased significantly after the six-class yoga program, consistent with results from similar studies that have addressed the impact of yoga and mindfulness practices on stress reduction (Hartfiel et al., 2011; Specia, Carlson, Goodey, & Angen, 2000). Given the lack of a control group, it's not possible to rule out the potential influence of other factors. The improvement in the POMS Anger/Hostility

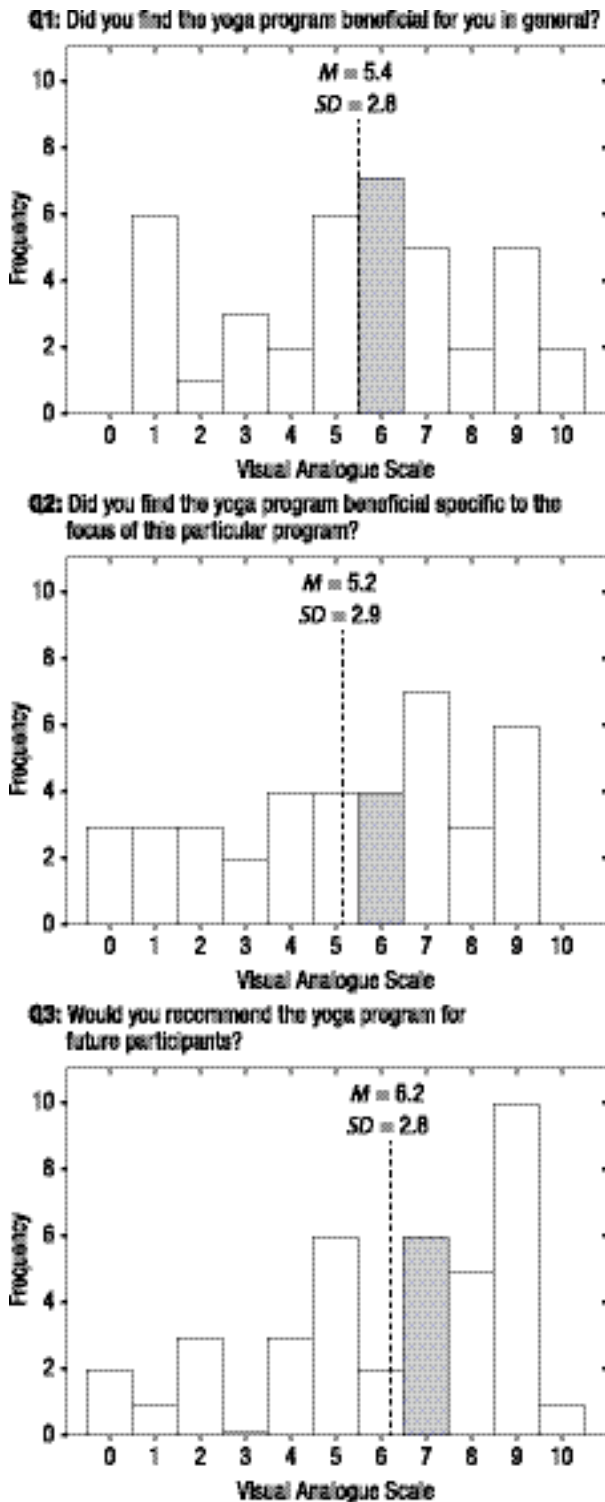
Table 2.
Mean Outcome Measure at Pre- and Post-Yoga Program (N = 39, Mean ± SD)

Outcome measures	Preintervention <i>M (SD)</i>	Postintervention <i>M (SD)</i>	Mean difference <i>M (SD)</i>	<i>p</i> -value ^a
PSS Global Scale	14.85 (6.40)	13.41 (5.44)	-1.44 (3.89)	0.03**
POMS-Global Scale	23.95 (18.53)	15.10 (15.09)	-8.85 (14.63)	0.00**
POMS-Tension	9.18 (4.05)	4.95 (3.20)	-4.23 (3.80)	0.0001**
POMS-Depression	3.26 (3.80)	2.79 (3.12)	-0.46 (2.61)	0.28
POMS-Anger	6.31 (4.52)	5.23 (3.06)	-1.08 (3.66)	0.07*
POMS-Vigor (reverse scored)	9.72 (4.54)	10.41 (3.97)	0.69 (3.23)	0.18
POMS-Fatigue	9.46 (4.43)	7.64 (3.72)	-1.28 (5.08)	0.03**
POMS-Confusion	5.46 (2.80)	4.90 (3.02)	-0.56 (2.98)	0.25
FFMQ-Global Scale	140.13 (17.53)	136.54 (21.10)	-3.59 (14.80)	0.14
FFMQ-Observing	25.31 (6.20)	23.90 (6.77)	-1.41 (5.15)	0.10*
FFMQ-Describing	29.74 (5.36)	28.62 (6.72)	-1.13 (4.84)	0.15
FFMQ-Awareness	30.87 (5.10)	30.13 (5.76)	-.074 (4.74)	0.33
FFMQ-Nonjudging	31.18 (5.39)	31.59 (4.89)	0.41 (4.31)	0.56
FFMQ-Nonreacting	23.03 (3.90)	22.31 (3.95)	-0.72 (4.08)	0.28

Note. ^aPostintervention vs baseline paired samples *t*-test; ** $p < .05$, * $p < 0.10$. PSS = Perceived Stress Scale; POMS = Profile of Mood States; FFMQ = Five Facet Mindfulness Questionnaire.

Figure 1.

The distribution of the frequency of responses for perceived benefit of the yoga program for Questions 1, 2, and 3, are represented in this histogram. The median is represented in gray and an approximate mean (based on a continuous scale on the x -axis) is represented by the dotted line. ($N = 39$).



subscale, though modest ($p = 0.07$), may be important in that police recruit anger at baseline has been shown to predict post-traumatic stress disorder (PTSD) symptoms and subsequent PTSD diagnoses after 1 year of service (Meffert et al., 2008). This may be particularly relevant given the intense demands of this 800-hour, 20-week police-training program.

There is evidence that behaviors such as partner abuse and hyperaggression that increase with chronic stress (Gershon et al., 2009) may be mitigated by maintaining a yoga practice (Ranta, 2009). According to the “anger aggression theory,” as chronic stress among law enforcement personnel increases, the perception of threat and subsequent aggressive responses become more likely (Griffin & Bernard, 2003). The potential of yoga practice to ameliorate stress, perception of threat, and aggressive behavior warrants further investigation.

No significant pre- to postintervention change was noted in the POMS Depression/Dejection scores. This is likely an artifact of the low baseline scores, which offered limited variability to detect effects over time (Brody et al., 2000; Lavey et al., 2005). Statistically significant change was also not detected for the Confusion/Bewilderment and Vigor/Activity subscales. Low scores for this sample suggest that these scales may lack the sensitivity to detect significant change or that these items may not be suitable for the law enforcement population.

Although previous studies have reported an increase in mindfulness after a yoga intervention (Cohen et al., 2004; Shelov et al., 2009), only a trend toward increases in the FFMQ Observing subscale was detected. It is possible that this intervention was not long enough to elicit effects. Extant research suggests that a minimum of 8 weeks of practice, often with more than one class per week (Shelov et al., 2009; Sherman, Cherkin, Erro, Miglioretti, & Deyo, 2005; Streeter et al., 2010), may be necessary to facilitate change. Carmody and Baer (2008) demonstrated that improvements in mindfulness and well-being were directly related to the frequency of practice in mindfulness techniques (Carmody & Baer, 2008). The six classes offered in our study were limited by scheduling constraints imposed by the police academy training program. It is possible that the lack of class consistency may have undermined treatment effects. Future studies may benefit from offering more frequent yoga instruction over a greater length of time as part of the police academy training.

Cadets’ evaluation of the yoga program suggested that most experienced the program as beneficial; however, the nature of these benefits varied across individuals. While one cadet preferred the breathing exercises, another favored the stretching component. Many reported yoga to be effective for relieving stress, and at least one expressed an interest in a longer program. Some trainees found it difficult to participate in a yoga class immediately after the physical training component of the academy. Injury can be cause for dismissal from the academy and is a concern among cadets. Although no adverse events were reported during the yoga program, it is possible that if injuries occurred, they were minimized or not reported.

Some trainees evidenced resistance to the program and raised questions regarding the relevance of yoga to law enforcement training. For purposes of this study, it was important to

adhere to the Kripalu yoga protocol, which emphasizes conscious awareness, breathing, yoga postures, deep relaxation, and meditation to determine its effectiveness for this sample. A didactic component explaining the potential benefits of a regular yoga practice may be useful for future studies among law enforcement personnel. The use of police wellness programs beyond cadet training may also be warranted.

Recruits reported that they were more likely to continue the physical postures and breathing practices rather than the meditation aspects of the yoga program. Certain yoga traditions emphasize asanas and other physical practices to prepare the individual for meditative conditioning of the mind (Iyengar, 1995). For beginning practitioners, the physical practices of yoga may be easier to accept before exploring the meditative component. We experienced very little negative feedback from police cadets during the yoga program, and most were willing to voluntarily complete the questionnaires. As such, the Kripalu yoga program was feasible in the police academy setting.

This study was limited by several factors. The lack of a control group attenuated our ability to draw definitive conclusions regarding the direct association between yoga and changes in stress, mood, or behavior, or to rule out nonspecific factors associated with change that were unrelated to the intervention. Yoga can be equal to or significantly better than other forms of exercise relative to a number of indicators of health (Ross & Thomas, 2010), yet the effects of the physical fitness regimen embedded in the police academy training program cannot be ruled out. Last, administration of questionnaires immediately following the final yoga class may have yielded proximal effects of the yoga practice rather than sustained change over time. Outcome measures were limited to self-report questionnaires. Future research would benefit from objective measures of stress.

This preliminary study provides initial evidence of the benefit of Kripalu yoga to reduce perceived stress, anger, tension, and fatigue among police academy trainees. Future longitudinal randomized controlled trials are needed to evaluate yoga's full potential as a permanent component of police academy training.

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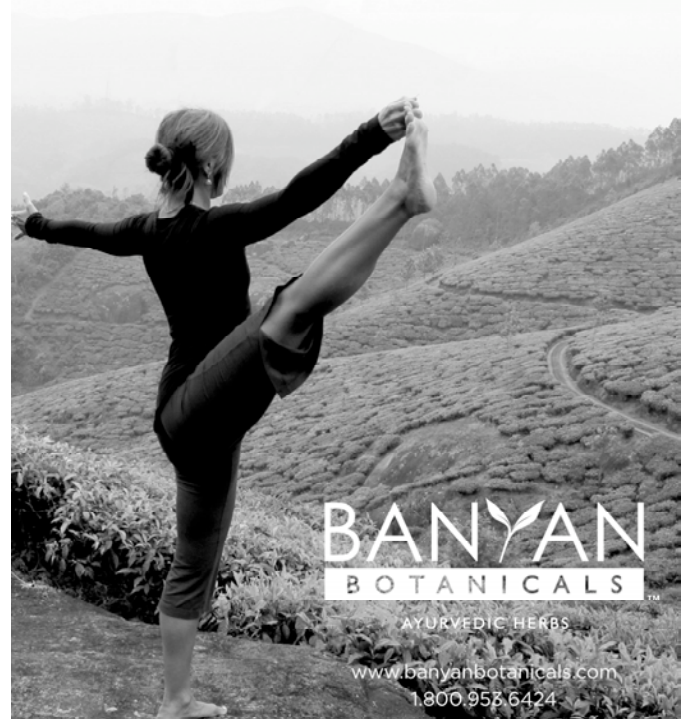
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