Original Article

Mitigating the Antecedents of Sports-related Injury through Yoga

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Abstract

Context: Injury risk among athletes is an epidemic. The psychological and physical loads imposed on athletes through psychosocial stressors and training regimens significantly increase athletes' injury risk. **Aims:** This feasibility study assessed whether a 10-week yoga intervention could be implemented successfully and mitigated antecedents of sports injury. **Methods:** Using a prospective, nonexperimental design, 31 male soccer players attending a college in the Pacific Northwest enrolled in the yoga intervention. The Recovery-Stress Questionnaire for Athletes (RESTQ-Sport) was completed at three time-points before and after the yoga intervention. The RESTQ-Sport scales, identified as strongest predictors for injury, were hypothesized to be mitigated through yoga. **Results:** Two stress-related scales were significant in the hypothesized direction: injury and fatigue. The general recovery scale, General Well-Being, was significant at one time-point, but in the opposite direction as hypothesized. **Conclusions:** Positive findings are discussed and explanations for unexpected changes are explored, along with study limitations. Results suggest that yoga can be successfully integrated into the athletic program of soccer players and provisionally support the potential of a yoga intervention to mitigate two significant antecedents of injury, namely, perception of propensity to sustain injury and generalized fatigue.

Keywords: *Athletes, injury risk, recovery-stress, sports*

Introduction

Athletes injure themselves, suffer illness, or endure some form of trauma at a significantly higher rate than nonathletes.[1] Prevention practices must be developed to mitigate athletes' injury risk. This study aimed to assess the feasibility and preliminary impact of neurophysiological and neurocognitive yoga-based practices[2] on psychophysical predictors of injury among male college soccer players.

Significant strain is placed on student athletes, ranging from the dangerous contact nature and intense training loads testing limits of physicality to frequent travel and unfamiliar sleeping conditions, all while balancing social activities and academic pursuits. Over a 16-year period (years 1988/1989 through 2003/2004), an 80% increase has been reported in female sports-related injuries and a 20% increase in male sports-related injuries.[1] Between 2004/2005 and 2008/2009 seasons, 55,000 male NCAA soccer players sustained injuries.[3] As the number of injuries continues to rise, health professionals are called upon to focus on prevention strategies that mitigate the incidence of sports-related injuries.

To determine possible causes of injury, researchers developed a multicomponent theoretical stress-injury model,[4] ultimately to inform prevention efforts. Identified were the following antecedents of injury: dysregulating life events, lack of effective coping strategies, sensitivity to stress, and the tendency to appraise situations as stressful. Antecedents in this context mean psychosocial-stress conditions preceding and increasing an athletes' likelihood of sustaining a sports-related injury. These researchers theorized that psychological stress is directly correlated with muscle tension, distractibility, and perceptual narrowing, all of which function to increase injury risk.

In 2001, a second set of researchers developed the Recovery-Stress Questionnaire for Athletes (RESTQ-Sport) to identify biopsychosociocultural antecedents of sports-related injury through assessing athletes' perceived stress and

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recovery balance.[5] The theoretical basis for this self-report questionnaire was that biopsychosociocultural stressors can induce a maladaptive psychophysical state that increases athletes' propensity for sports-related injury. Imbedded within the RESTQ-Sport are 19 scales, assessing general and sports-related stress and recovery. Although research has been mixed about which of the 19 RESTQ-Sport scales are the most useful predictors of injury, some agreement has emerged for the following seven scales: Injury, Fatigue, General Well-Being, Physical Recovery, Self-Efficacy, Self-Regulation, Physical Recovery, and Being in Shape.[5-9] These seven scales thus became of primary interest in this feasibility study.

With antecedents of injury defined and a measure identified to assess injury antecedents, the question of how to mitigate these antecedents still needed to be addressed. Considering the multifaceted and challenging nature inherent in being a student athlete, yoga presents itself as a viable intervention. Although developed in 5th century BCE India, yoga has become the object of much modern research[10] that has documented its utility in a variety of contexts and with diverse populations. Yoga, as embodied movement that integrates a holistic range of practices (such as ethics, discipline, movement, breath, and meditation), enables practitioners to gain skillful control over viscerosomatic information on and off the mat, the outcome being increased well-being as measured via flexibility and adaptability in functioning.[11-13]

A holistic yoga practice begins with and is sustained by ethics (moral observances Sanskrit: *Yamas* and self-discipline Sanskrit: *Niyamas*). Through embodiment of the ethical precepts, yoga-athletes' decision-making may engender health-promoting behaviors.[14] For example, embodied ethics of nonviolence (Sanskrit: *Ahimsa*), moderation (Sanskrit: *Brahmacharya*), and self-study (Sanskrit: *Svadhyaya*) may influence how a yoga-athlete interacts with a stressor, inspiring top-down (i.e., higher-level brain networks) modulation, shifting from emotional reactivity toward skillful executive control.[15] As yoga practices influence executive control and attentional flexibility,[16] yoga-athletes may become better adept than non-yoga-athletes at inhibiting negative appraisal, rumination, and emotional reactivity in response to stressors, indirectly downregulating autonomic arousal through limbic inhibitory projections.[14,17] Without adaptively interacting with stressors, psychophysiological strain accumulates, inducing allostatic overload, during which "serious pathophysiology can occur."[18]

The physical practice of yoga (Sanskrit: *Asana*) further reduces allostatic load through multiple mechanisms. Biomechanical changes in body position (e.g., heart-openers) influence pulmonary ventilation, gas exchange, and cardiovascular function,[14] positively affect performance measures of flexibility and balance,[19] attenuate peak muscle soreness,[20] and more.[21] Though it remains unclear whether these positive physical changes directly influence athletes' susceptibility to sports-related injury, researchers have correlated high concentrations of blood lactate with physiological strain[22] and have identified multifaceted physical interventions that include a balance component to reduce ankle and knee injuries.[23]

Allostatic load may further be mitigated through breathing practices (Sanskrit: *Pranayama*) of various forms, such as three-part inhale/exhale, alternate nostril breathing, and forceful expulsion of breath. Supported by polyvagal theory,[24-26] breath control equips yoga-athletes with direct influence over autonomic arousal through vagal nerve stimulation. With the capacity to volitionally induce an adaptive parasympathetic response through vagal nerve stimulation, yoga-athletes may inhibit a maladaptive, sympathetic-driven response to stress (including muscle tension and pain, inflammation, and vaso- and pulmonary constriction[14]).

The meditative limbs represent the final limbs of yoga and further reduce allostatic load. Sensory withdrawal (Sanskrit: *Pratyahara*), concentration (Sanskrit: *Dharana*), meditation (Sanskrit: *Dhyana*), and integration (Sanskrit: *Samadhi*) represent the deepest layers of yoga, are woven throughout an integrated yoga practice, and may guide yoga-athletes toward interoceptive states of being. Interoception, defined as sensing the body's physiological condition,[27,28] may enable yoga-athletes to detect physiological disturbances[29] and mitigate allostatic load by replacing maladaptive reactions to stress with adaptive responses.[30]

This feasibility trial explored whether a multifaceted yoga intervention can be successfully integrated into the athletic experience of soccer players and whether such an intervention can mitigate players' perceptions of psychophysical stress, as monitored by RESTQ-Sport scores. We hypothesized that engagement in a multifaceted, empirically based yoga intervention significantly reduces scores on RESTQ scales Fatigue and Injury, from pre-test to post-test and sustained at follow-up, and significantly increases scale scores on Physical Recovery, Being in Shape, General Well-Being, Self-Efficacy, and Self-Regulation, from pre-test to post-test and sustained at follow-up.

Methods

This 10-week feasibility study was approved by the host university's IRB committee. Using a prospective, non-experimental design, pre-, posttest and follow-up measures were used to assess the impact of yoga on student athletes' perception of sports-related recovery and stress. Recruitment began with a flyer advertising free therapeutic yoga for student athletes and was posted at the university's undergraduate campus. The head coach

of the Men's Division III Soccer Team contacted the PI to conduct the offered yoga intervention with the entire team (n = 31). Players were screened for eligibility based on the following criteria: at least 18 years of age; a student athlete, free of acute or chronic physical injury that may hinder or be exacerbated by participation; and willingness to consent to participation, including signing an informed consent form. Athletes who experience preexisting acute or chronic injuries needed approval from team's medical staff prior to participation, communicated to PI by the team's head coach.

Participants

Of 31 soccer players enrolled (M age = 19.58, standard deviation [SD] = 1.12), one player was cut from the team roster and three players were unable to complete the protocol due to having sustained an injury during soccer practice. All participants self-identified as male. The sample was predominantly Caucasian (20, 64.5%), with 1 (3.2%) Native Hawaiian, 2 (6.5%) Latino/Hispanic, 4 (12.9%) Asian American, and 4 (12.9%) multiracial individuals. Current and historical medical problems were endorsed by 14 players (52%; some had multiple problems), including two with concussions (7%), three with back pain (11%), seven with ankle pain (26%), and four with knee pain (15%).

Procedures

The intervention was an adaption of an original yoga protocol developed by Brems.[13] The PI was trained on the original yoga protocol, as were the two registered yoga teachers who cofacilitated classes. Protocol adaptation was accomplished by Arbo and Brems and included the following:

- Class material was abbreviated, as maximum session length permitted by the head coach was 45 min
- Presentation of didactics was tailored to sample characteristics. For example, complex philosophical themes were translated into understandable and practical concepts, often supplemented with anecdotes from lead teacher
- Language was adapted to be culturally appropriate for student athletes by eliminating use of imagery and Sanskrit, and using plain language (e.g., from "bring balance and concentration to the pose as a means to find confidence and courage" to "recognize the subtle muscle engagement holding you here")
- With the heightened risk for injury, adapted protocol postures were low-intensity, fewer in number, and proprioceptive and interoceptive cues were emphasized. These adaptations enabled a slow-paced, deeply introspective class, to ultimately avoid aggravating the preexisting degree of physical strain present in participants
- Classes were shortened to 45 min each.

Classes were composed of 22–27 participants, located in a padded wrestling room, and held immediately after soccer practice on Wednesday mornings (8:00–8:45). Table 1 details specific changes to adapt the protocol for use in the present study. Figure 1 provides the adapted protocol for class 3 as a sample, with Arbo as subject of photos.

Following approval by the university's Institutional Review Board and in accordance with the Helsinki Declaration, all participants completed paper format pre- and post-test measures; pre-test immediately preceding class 1, post-test immediately following class 10. Follow-up measures were administered via Qualtrix 10 weeks following post-test.

Instrumentation

The Recovery-Stress Questionnaire-Sport (RESTQ-Sport) is a 52-item, self-report, Likert-scale questionnaire (0 = *never* and 6 = *always*), consisting of general and sport-specific stress and recovery scales.[5] The questionnaire has four dimensions: general stress, general recovery, sports-related stress, and sports-related recovery. All scales tap into the subjective nature of consequences from general and sports-related demands within a 3-day period. General stress items ask questions regarding, for example, feeling overtired (FATIGUE). General recovery items ask questions such as satisfaction with sleep (sleep quality). Sports-related stress items ask questions such as whether muscles felt stiff or tense during performance (injury). Sports-related recovery items ask questions such as perceived ability to achieve peak performance (self-efficacy).

High scores on the 26 stress scales indicate high levels of subjective distress induced by general conditions of life and sports-related conditions. High scores on 26 recovery scales, inversely, indicate a high sense of efficacy in rebounding resources after conditions of stress. Scores for each scale are obtained by taking a mean of all item ratings; mean scores can be compared across time points to observe change. The REST-Q scales have good internal consistency (0.67–0.89) and high test–retest reliability (>0.79).

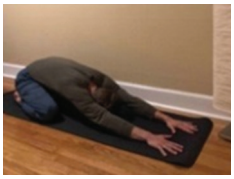
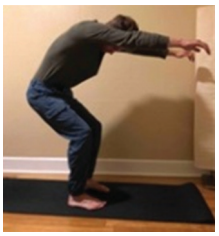
For the purposes of this study, seven scales were used to test hypotheses: Fatigue, Injury, Physical Recovery, Being in Shape, General Well-Being, Self-Efficacy, and Self-Regulation. The other 12 scales were not considered because research has indicated these 12 scales to not be equally strong predictors of injury.

At posttest only, athletes were asked one open-ended question: "How has your engagement in this opportunity influenced your performance in sports, academics, social life, personal life, etc.?" This question was developed to assess for general impressions after having completed the yoga series. Responses were coded to detect themes that may help underscore or augment quantitative findings.

Statistical analyses

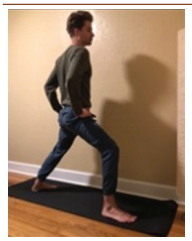
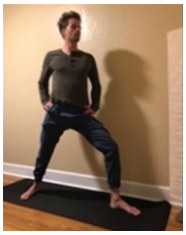
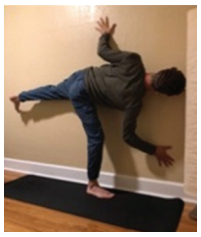
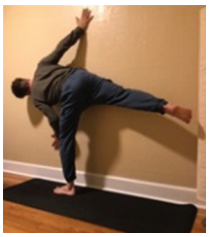
Reference values were defined by the means and SDs of seven RESTQ-Sport stress and recovery scales. As

Figure 1: Sample protocol: Session 3

Asana or Intention	*Asana Picture*	*Alignment*	*Intention*
	Child's Pose	• Knees spread hips-distance apart • Torso between thighs • Arms extended forward	• Sensations of equal breathing in low back • Navel draws in towards spine
	Table-Top Cat-to-Cow	• Knees planted under hips, hands planted under shoulders • Anterior tilt of pelvis, neck extension • Posterior tilt of pelvis, neck flexion	• Movement originates in sacrum • Press finger pads into floor • Traction knees apart to enhance stability
			
	Crouched Cat-to-Cow	• Knees lined up with third toe, with toes visible beyond crouched knees • Anterior tilt of pelvis, neck extension • Posterior tilt of pelvis, neck flexion	• Movement originates in sacrum • Sustain activation of navel • Recognize low body minute muscle activation facilitates balance
			
	Thread-the-Needle R-to-L Arm	• Knees planted under hips, hands planted under shoulders • Torso rotation with arm extended above • Extended arm threaded under opposite arm • Ear and shoulder planted on floor	• Simultaneously reach out through extended arm and ground down through planted knees • Create space between shoulder and ear
			

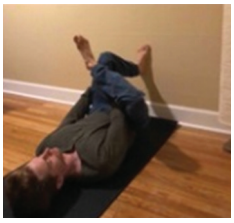
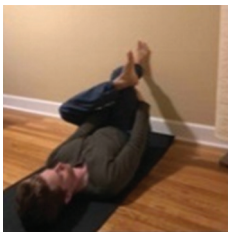
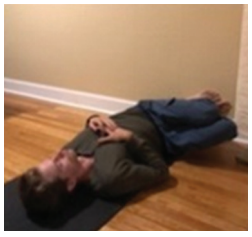
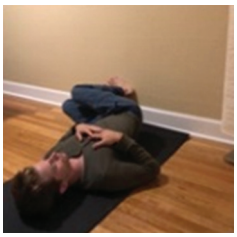
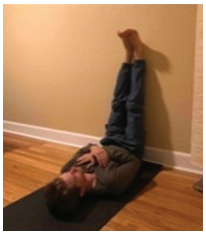
Contd...

Figure 1: Contd...

Asana or Intention	Asana Picture	Alignment	Intention
	Warrior II R-to-L Leg Forward	• Forward foot pointed straight, knee above ankle and in line with third toe • Back foot in line with angle of back knee • Shoulders rotated back	• Press into the heel of the front foot, traction toes of back foot • Adduct legs and rise up from navel
			
	Half Moon R-to-L Leg Forward	• From Warrior II, forward foot becomes standing leg • Torso leaned over bent standing leg, floating leg extended behind • Hips rotated open • Hands pressed into wall	• Activate arch of standing leg • Traction hands on wall together to assist muscles throughout torso • Lengthen spine through antagonistic extension of head and heel of floating leg
			
	Tree Pose R-to-L Leg Forward	• Sacrum and shoulders pressed into wall • Standing leg planted on floor, floating leg pressed into calf of standing leg • Arms spread wide against wall	• Draw in towards midline • Engage transverse abdominis by drawing hip points together • Equal-opposing force between calf of standing leg and foot of floating leg
			

Contd...

Figure 1: Contd...

Asana or Intention	Asana Picture	Alignment	Intention
 	Figure-Four R-to-L Leg	• One knee at an angle above hip, with foot pressed into wall • Opposite foot crossed over angled knee	• Balance integration of muscle engagement with letting go • Press floating knee towards wall • Posterior tilt of pelvis to engage transverse abdominis with
 	Spinal Twist R-to-L Side	• On back, knees together hugged into chest, feet positioned against wall, legs twisted across body • Scapula's remain connected to floor	• Release of muscles surrounding spine • Support healthy range of motion of spine with activated naval
	Legs-up-the-Wall	• R hip on floor, buttocks against wall • Legs rotated to midline and extended up wall • Chin tucked into chest	• Sense blood and lymph move towards heart and brain • Release into floor beneath • Reconnect with equal breath

mentioned above, seven of the 19 RESTQ-Sport scales were evaluated (Fatigue, Injury, Physical Recovery, Being in Shape, General Well-Being, Self-Efficacy, and Self-Regulation). These scales are identified as the strongest predictors of injury among soccer players and athletes in general.[5-9] Paired samples *t*-tests were used to analyze RESTQ-Sport scales to account for attrition from pre-test (n = 31) to post-test (n = 27) to follow-up (n = 19). For each RESTQ-Sport scale, data at pre-test were contrasted against data at post-test and follow-up; data at post-test were contrasted with data at follow-up. Bonferroni adjustment was applied to P value level of significance, resulting in $P < 0.007$ being considered statistically significant. Effect sizes were calculated using Cohen's *et al*.[31] and were classified small (0.20–0.49), medium (0.50–0.79), or large (0.8 or greater).

Results

Recovery-Stress Questionnaire-Sport Stress

Paired samples *t*-tests were calculated for two scales, comparing means across three time points (pre-, post-test,

and follow-up); the results are shown in Table 2. Positive effect sizes for Injury and Fatigue indicate positive change [i.e., a decrease in mean score from one time point to the next identifies a participant experiencing greater recovery or less stress; Table 2]. REST-Q Sport scale, injury, was statistically significant at pre- to post-test (P = 0.000), sustained at follow-up (P = 0.000), both with large effect sizes (d = 1.34; d = 1.71), respectively. REST-Q Sport scale, Fatigue, was also statistically significant at pre- to post-test (P =0.000), sustained at follow-up (P < 0.001), and with large effect sizes (d = 0.85; d = 1.20), respectively.

Recovery-Stress Questionnaire-Sport Recovery

Paired samples t-tests were calculated for five scales, comparing means across three time points (pre-, post-test, and follow-up); the results are shown in Table 3. Negative effect sizes for self-regulation, self-efficacy, general well-being, being in shape, and physical recovery indicate positive changes [i.e., an increase in mean score from one time point to the next indicates that a participant is experiencing greater recovery or less stress; Table 3]. Self-regulation, self-efficacy, physical recovery, and being in shape were not significant; however, Being in Shape did have a P = 0.029 and a small effect size (d = −0.47). General Well-Being was significant at post-test to follow-up (P = 0.002), with a medium effect size (d = 0.53).

Discussion

This feasibility trial, in which we piloted an adapted version of an evidence-based yoga protocol[13] with student athletes, had mixed findings. Results suggest the intervention was feasible, as attrition was low and compliance was high. Collaboration with the head coach proved integral, throughout intervention proceedings, for recruitment and retention, which suggests a yoga intervention is best delivered with consideration of the specific circumstances faced by specific soccer or athletic teams. Results regarding RESTQ-Sport scales Injury and Fatigue suggest this yoga intervention was successful in mitigating student athlete's perception of psychophysical stress including fatigue, generalized muscle soreness, and injury proneness. Results pertaining to RESTQ-sport scales self-regulation, self-efficacy, physical recovery, and being in shape scales were not significant. Although Being in Shape scale comparisons did not reach statistical significance, athletes' perception of their physical strength, conditioning, recovery, and energy levels did improve (P = 0.029; d = −0.47). The general Well-Being scale results suggest athletes perceived their mood and spirits to be worse at follow up (10 weeks post project completion).

A proposed mechanism for change observed among Injury and Fatigue scales is yoga's influence upon perception. REST-Q Sport is inherently subjective, which implies assessment is of perceived stressor impact. An important

Table 1: Primary protocol features and adaptations for use with athletes

Component	Original protocol[13]	Adapted protocol
(a) Protocol	10-week	10-week
	90-min classes	45-min classes
	Flow: Dharma talk; pranayama; asana; meditation; check-in	Flow: Concept, breath, and mindfulness cue introduction; asana; feedback
(b) Didactics	In-depth discussion of the dharma	Abbreviated presentation of the dharma
(c) Language	Philosophy in Sanskrit and English	Concepts in English only
	Tailored to doctoral-level professors and students	Tailored to male student athletes
	Use of imagery: "awaken the spine"	No use of imagery
(d) Asana	20 postures on average	10 postures on average
	Peak pose offered, adaptations demonstrated	Low-intensity peak poses only
	Use of props (block, mat, bolster, strap, zafu, blanket)	No props, used padded wrestling room's floor/wall
	Equal balance across themes	Emphasized psychophysical theme

Table 2: Recovery-stress questionnaire - sport stress

Outcome	Pretest		Posttest		Follow-up		*n*	*df*	*t*	*P*	*d*
	M	SD	M	SD	M	SD					
Fatigue	3.41	1.56	2.04	1.66			27	26	3.99	0.000*	0.85
	3.55	1.48			1.95	1.17	19	18	3.82	0.001*	1.20
-			2.21	1.71	1.95	1.17	19	18	0.61	0.551	0.18
Injury	3.81	1.24	2.13	1.26			27	26	5.54	0.000*	1.34
	3.92	1.16			1.90	1.20	19	18	5.25	0.000*	1.71
-			2.16	1.12	1.90	1.20	19	18	0.94	0.359	0.22

*P<0.007. Higher scores indicate greater stress. SD: Standard deviation

Table 3: Recovery-stress questionnaire - sport recovery

Outcome	Pretest		Posttest		Follow-up		*n*	*df*	*t*	*P*	*d*
	M	SD	M	SD	M	SD					
Physical recovery	2.37	1.18	2.59	0.99			27	26	−1.09	0.286	−0.20
	2.24	1.15			2.58	1.02	19	18	−1.41	0.174	−0.31
-			2.47	1.06	2.58	1.02	19	18	−0.37	0.714	−0.11
General well-being	3.87	1.08	4.15	1.18			27	26	−1.43	0.166	−0.25
	3.90	1.08			3.50	1.29	19	18	2.33	0.031	0.34
-			4.13	1.10	3.50	1.29	19	18	3.62	0.002*	0.53
Being in shape	2.85	1.04	3.34	1.06			27	26	−2.31	0.029	−0.47
	2.86	1.13			3.25	1.33	19	18	−1.34	0.199	−0.32
-			3.17	1.05	3.25	1.33	19	18	−0.24	0.815	−0.07
Self-efficacy	3.51	1.01	3.48	1.03			26	25	0.15	0.885	0.03
	3.34	0.99			3.09	1.11	19	18	0.88	0.391	0.24
-			3.38	0.85	3.07	1.14	18	17	1.04	0.312	0.31
Self-regulation	2.96	0.78	3.09	1.00			25	24	−0.65	0.522	−0.15
	2.95	0.73			2.91	1.16	19	18	0.13	0.896	0.04
-			3.08	0.96	2.94	1.18	18	17	0.45	0.660	0.13

*P<0.007. Higher scores indicate greater adaptability. SD: Standard deviation

finding indicated perception as a more salient ingredient in mitigating the stress-injury relationship than in mitigating physical-based stressors.[32] Our assertion is that participants may have learned interoceptive skills to facilitate activation of high-and low-level brain networks suggested to mediate and moderate stress responses.[14] Specifically, top-down and bottom-up processing mitigates maladaptive responses to stress (top-down: emotional reactivity, negative appraisal, and rumination; bottom-up: moderation of inflammatory responses, muscle tension, and pain). It is the conjoint cultivation of effective and interactive top-down and bottom-up self-regulation that is a major contributor to yoga's effectiveness[11] and is proactively applied via the yoga protocol used in this study. Anecdotal data collected through post-test-only, open-ended questions elicited meaningful responses underscoring effects of the piloted intervention on athlete perception of perceived stressor impact. Sample statements included feeling "more relaxed," and noticing yoga "helped during stress times." and ".showed me ways to calm down through breathing." Anecdotal data and injury/fatigue scale changes suggest players' perceived ability to navigate psychophysical stress was influenced by the piloted intervention.

The second proposed mechanism is improvement in range of motion and balance. Although not measured in the present study, prior research[19] and anecdotal data from participants (e.g., "[I felt] more loose. more flexible… less injury prone") suggest the included *Asana* practice may have contributed to change observed in Fatigue and Injury scales.

The RESTQ-Sport recovery scale General Well-Being trended in a statistically significant direction of change counter to what was hypothesized. Although this finding may be counterintuitive and was not predicted, it is not unprecedented in the literature. For a yogi who is new or inexperienced, enhanced recognition of distress can make distress seem more frequent. Higher self-report of perceived stress can result from this enhanced awareness in the short term.[33,34] In addition to stress resulting from increased interoception, uncontrolled environmental factors (e.g., University examinations) may have influenced participant's perceived and self-reported distress.[35]

Limitations

Feasibility dictated design decisions that may have led to less than optimal intervention quality. First, sampling was neither random nor representative of general athlete populations. Diversity in demographics and type of sport limit generalizations of current research. For example, gender representation was all male and racial composition was largely Caucasian (64.52%), both of which are nonrepresentative of NCAA soccer programs.[36] Further, no control group was included as recruitment for this study proved extremely difficult. The Head coach and PI mutually agreed all players would participate. Statistical power was limited due to sample size and to attrition from post-test (n = 27) to follow-up (n = 19).

Second, restrictive training schedules imposed by the NCAA decreased dose-response, suggested to be imperative in producing desired effect of practicing yoga.[37] Intervention timing had to be condensed (from 90 to 45 min), an adaptation to the original protocol that may have impeded effectiveness. Location restrictions related to heavy scheduling demands also meant that no yoga props were available. Poses were adapted to using what was available, which included the well-padded floor of the wrestling room and wall space. Not having yoga props was a significant limitation in the present study, as efforts were made to adapt the protocol to the physical limitations of soccer players (e.g., limited range of motion).

The feasibility limitations encountered in this study reflect reality, however. As such, the present study design conditions have strong external validity and likely represent feasibility across most academic departments with little to no funding.

Future considerations and recommendations

More research is needed following similar procedures: Use of multifaceted yoga intervention, collegiate-level student athletes, and RESTQ-Sport.[5] In such research, environmental and timing aspects of a yoga intervention need to be carefully considered. Weaving yoga into existing activities and schedules may be essential to proper dosing of the intervention (e.g., *Asana* practice integrated in warm-up practices; *Pranayama* integrated into drills; *Yamas* and *Niyamas* integrated into locker room communication). Findings from this and prior studies suggest this may be time and effort well-spent for sake of college athletes' well-being. Inclusion of a control group, larger sample size, and diversity reflective of NCAA populations would allow for more statistical power and external validity.

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Conflicts of interest

There are no conflicts of interest.

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