

QUALITATIVE EVALUATION OF A HIGH SCHOOL YOGA PROGRAM: FEASIBILITY AND PERCEIVED BENEFITS

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This is the first published qualitative assessment of a yoga program applied in a high school setting. This qualitative interview study was nested in a randomized, controlled trial studying the effects of a yoga program offered in place of a semester of physical education classes at a rural public high school. Student interviews were conducted after taking part in a semester of the yoga program. A formal passive consent with information about the qualitative study was sent home to parents/guardians of all students in the parent study before the interviews. Most students enjoyed the yoga classes and felt benefits. Negative reports of yoga practice were associated with gender as most males sensed peer pressure against practicing yoga. Despite this finding, most students wanted to continue yoga and would continue if it were offered in school. Positive reports include a greater kinesthetic awareness, which some students associated with a greater respect

for the body and improved self-image. Among students reporting psychological benefits, many cited stress reduction; many used yoga to manage negative emotions; and some propagated more optimism. Most thought yoga could reduce interest in the use of drugs and alcohol and increase social cohesion with family and peers. We found that a yoga program is feasible in this sample of 9th and 10th graders, especially after benefits are perceived. We also found evidence that yoga may lead to emergent positive benefits in health behaviors not directly prescribed by the program. These results suggest that school-based yoga programs may be appropriate for promoting healthy behaviors at a societal level by focusing on the prevention of negative patterns during the adolescent transition.

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INTRODUCTION

Yoga is a comprehensive mind–body practice that involves physical postures and movement, breathing exercises, relaxation, and meditation to develop self-observation without judgment while the body moves and breathes, with the ultimate goal of unifying the self at physical, emotional, cognitive, spiritual, and social levels.^{1–3} During the past decade, yoga has become extremely popular among Americans, including American youth. In 2007, 2.1% of children younger than 18 practiced yoga.⁴ Although many adults seek yoga to improve psychological well-being and manage stress,⁵ there is little information presently available examining why youth may practice. Most of the emerging scientific evidence for yoga as a therapeutic intervention is based on samples of adults rather than children. Basic research on adults practicing yoga and its component techniques has indicated effectiveness in reducing stress and arousal.^{6–8} Yoga may be most effective in treating disorders that have a

strong psychosomatic, psychological/psychiatric, or stress-related component^{9–11}; for example, outcomes studies in adults have shown benefit of yoga for stress,^{12,13} depression,^{14,15} anxiety,^{15–18} and insomnia.^{19–21} Although much less research has been published on yoga for youth, emerging outcomes are similar to adults. For example, three recent systematic reviews indicate that mental health improvements in healthy children and adolescents included improved mood (particularly anxiety and negative emotional states) and reductions in stress.^{22–24} Previous work with our program in 11th- and 12th-grade high school students randomly assigned to either a yoga program for 12 weeks during Physical Education (PE) or PE-as-usual showed significant pre/postimprovements in resilience to stress, negative affect, anxiety, and anger control relative to controls.²⁵

The practice of yoga is a complex holistic intervention in which each student can find his/her unique trajectory of change and improvement. Yoga practitioners frequently report nonspecific positive effects, those being changes in addition to or different from what drew them to begin a practice.²⁶ Qualitative research, which collects data on the lived experiences of participants, is the perfect tool for exploring such complex, unique experiences,²⁷ enriching our scientific knowledge beyond what can be gained quantitatively.²⁸ The purpose of the present qualitative analysis is to gain a deeper understanding of individual perspectives of students participating in the treatment arm of our yoga trial. Specifically, we collected student perspectives about: (1) the practice of yoga within the school curriculum, (2) perceived benefits of yoga, (3) participating in a research study. Results will guide further development of the yoga program

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under study, provide new or more specific hypotheses about quantitative outcomes, and improve study administration.

METHODS

Parent Study

In this randomized, controlled trial we examined the effects of the Institute for Extraordinary Living, Kripalu Center for Yoga and Health “Yoga in the Schools” program offered in place of a semester of PE classes at a rural public high school in Western Massachusetts. Recruitment consisted of sending study information home to parents and describing the study verbally to students. We used a passive consent, opt-out procedure; study approval and oversight was performed by the Partners Human Research Committee, Brigham and Women’s Hospital, Boston, MA. The only inclusion criterion was the willingness and ability of students to participate in the research protocol and classes. There were no exclusion criteria. Recruited 9th- and 10th-grade students were randomly assigned by class period to either regular PE class (control group) or a 12-week-long yoga session during regularly scheduled PE class (yoga group). Both groups met two to three times per week in accordance with the school’s PE class schedule.

The Yoga in the Schools program is based on Kripalu yoga, a multicomponent, classical hatha yoga style. This program is a secular, 32-lesson-plan manualized curriculum that includes four key elements of classical hatha yoga: postures, breathing exercises, deep relaxation, and meditation techniques, such as centering and developing a quiet mind.²⁹ Each 30-minute lesson plan is structured to include a 5-minute centering, 5 minutes of warm-up, 15 minutes of yoga poses, and a 5-minute closing relaxation. Partner poses and games are incorporated periodically into the time allotted for yoga poses. Each lesson has a yoga philosophy theme discussed throughout.

Immediately before and after the 12 week yoga program, trained study staff administered our 18-page packet of self-report questionnaires to students as a group during PE class. Completion of questionnaires took up to two PE class periods (60 minutes’ total). All scales were previously validated in adolescents, unless an adequate adolescent scale for the construct of interest did not exist. The constructs of interest captured two broad areas of psychosocial well-being and coping/self-regulatory skills, including mood/affect, perceived stress, anxiety, emotion regulation, mindfulness, self-esteem, and positive psychology.²⁵

Current Study: Qualitative Interviews and Representativeness Tool

The qualitative student interviews were conducted the week after the administration of quantitative questionnaire, which occurred upon completion of the Yoga in the Schools program. A formal passive consent with information about the qualitative study was sent home to parents/guardians of all students in the parent study before the interviews. Because of personnel and time constraints, a subset (half) of the students in the yoga group were selected to participate in interviews via stratified randomization; strata were gender and grade. Two of the authors (L.A.C. and J.J.N.) created an interview agenda designed to explore adolescents’ perceptions of the program, including experiences

with the class, experiences with the study, and other changes associated with yoga practice (Appendix A). Four interviewers familiar with yoga and meditation were trained to conduct the interviews one-on-one and face-to-face. When appropriate, interviewers probed students to retrieve explanations and experiences related to the yoga classes. Each interview was audio-recorded with student permission and took an average of 10 to 15 minutes. Additional data were also collected after each interview in the form of interviewers’ written notes, personal observations, and feelings.

A thematic analysis was used. The audio transcripts were first read at least twice per and then double coded for themes independently by two of the authors (J.L.F. and R.S.K.). Any disagreements in coding were addressed in discussion. Coding consisted of searching for sought themes and emergent themes in each transcript as well as condensing responses to each topic across the sample.

Representativeness Tool

To better judge the representativeness of the qualitative interview subgroup, we gathered experiential information from all students who participated in the yoga program, students chosen to be interviewed as well as those that were not, completed an internally created program evaluation form as part of the endpoint survey before the qualitative interviews were performed. This form had seven questions on perception of the benefits, utility, and value of the yoga program and one probe for open-ended qualitative comments. Students indicated how strongly they felt in response to each question by marking a vertical line on a 10-cm horizontal visual analog scale that ranged from “not at all” (0 cm) to “very much so” (10 cm).

RESULTS

Twenty-eight students from the yoga group participated in the interviews (Table 1). This subset included two noncompleters; one male interviewee dropped out half way through the yoga program, whereas another interviewed male dropped out after baseline questionnaires. All of the students randomly selected for interviews participated in the interviews.

Twenty-five of the 26 students that completed interviews also completed the program evaluation form. One student had miss-

Table 1. Demographic Characteristics of Yoga Students Who Were Interviewed (n = 28), n (% of Sample)

Female	17 (61)
Male	11 (51)
Age (\pm SD)	15 (\pm 1)
9th grade	13 (46)
10th grade	15 (54)
Hispanic or Latino (vs not)	2 (7)
White	24 (86)
American Indian/Alaskan native	1 (4)
Asian	1 (4)

Table 2. Written Yoga Program Evaluations Rated on a 10-cm Visual Analog Scale (0 cm, “Not at All” to 10, cm “Very Much So”) by All Students in the Yoga Group and the Subset of Students Interviewed

Question	Yoga Group (n = 47)	Interviewees (n = 25)
Did you find that the yoga was helpful for you in general?	5.8 ± 2.6	5.9 ± 2.7
Did you find that the yoga helped you with your life in school?	4.7 ± 3.0	4.5 ± 3.0
Did you find that the yoga helped you with your life at home?	5.0 ± 3.0	4.8 ± 3.2
Did you use things you learned in the yoga program to help you at school?	4.6 ± 2.7	4.2 ± 2.8
Did you use things you learned in the yoga program to help you at home?	5.0 ± 2.9	4.5 ± 2.9
Do you think the yoga was valuable enough that you would recommend it to your friends?	5.6 ± 3.3	5.0 ± 3.4
How much would you like to continue practicing yoga?	4.7 ± 3.3	4.5 ± 3.6

Values are mean ± SD.

ing data for this form. Average visual analog scale scores for the using the Representativeness tool with the full sample were similar to those of the interviewed subsample (Table 2), suggesting that the views of the interviewed subsample were similar to those of the larger sample.

Because of the exploratory nature of the semistructured interview, offering frequencies of the qualitative reporting of particular themes makes little sense. Instead, terms such as “all,” “most,” “a few,” and “one” are used following the recommendations of Price et al.³⁰

Our findings are grouped into four categories:

1. *Individual benefits:* student responses to the practice of yoga postures and breathing techniques, including how they have used these techniques to help themselves outside of yoga class. Themes here include (1) athletic performance, (2) bodily awareness, (3) mental health, (4) stress reduction, (5) interest in substance use, and (6) academic performance
2. *Social benefits:* ways that students used techniques learned during yoga class in relationships with others, including friends, teachers, and family.
3. *Insights on designing yoga programs in this context and population:* student insights concerning: (1) improving the feasibility of teaching the yoga program, (2) conducting research on the program, and (3) continuing a yoga practice postprogram.
4. *Insights into research in this population:* student suggestions to improve the implementation of yoga program research in high schools. Themes include (1) using PE class periods to administer yoga class, (2) completing self-report surveys may be challenging for some adolescents.

Individual Benefits

Students reported that the yoga classes offered beneficial tools that they used in various contexts, such as before taking tests, before going to bed, during sports competitions, and during emotionally challenging times. Student reported benefits include improved athletic performance, increased bodily awareness, improved mental health, and improved academic performance. Interestingly, students tended to focus on physical or mental benefits but not both simultaneously.

Athletic Performance. All self-identified athletes found that yoga enhanced their performance. For example, yoga helped to loosen tight muscles, remove soreness, avoid injury, regulate respiration, and calm a fast heartbeat after exercise. Athletes reported applying yoga skills for football, swimming, basketball, track, soccer, equestrian, and dancing. These student athletes benefitted from practicing yoga during class and by using postures and breathing techniques before, during, and after these other athletic events.

Interestingly, breathing was the most frequently cited tool that athletes applied outside of yoga class. Athletes applied different breathing techniques, including deep diaphragmatic breathing, breath linked with body motion, and simple awareness of breath in different scenarios. Some instances included: preparing mentally before games, recuperating in between plays, and resting after activity had ceased.

It helped me with running definitely. Especially the breath exercises, I was able to apply those before races . . . Mainly the idea of focusing on the breath but some of the sun breaths and the deeper stuff I did practice before track meets. Male, 9th grade

Yoga postures were the next most common tool that athletes reported as benefitting them, primarily in the form of physical benefits. Physical practices during yoga class helped these student athletes prepare for games and practice by loosening muscles. Yoga postures were also used outside of yoga class to help reduce the risk of injury and soreness, as well as to enhance the benefits of weight lifting.

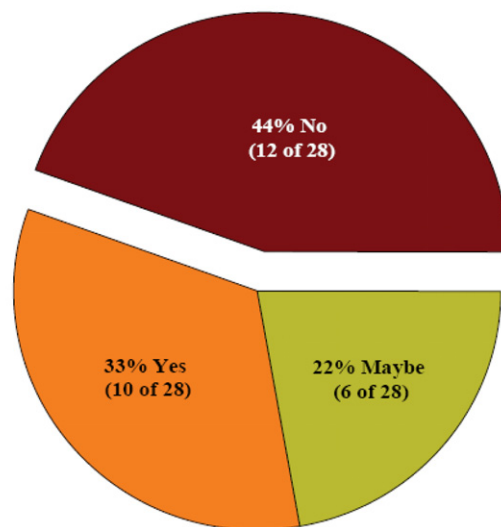
The stretches helped a lot for sports . . . my legs would not hurt as much for sports and it helped with performance a lot more . . . If I had a game that day, a baseball game, I would always see if I had yoga that day because it usually would loosen me up for that game. It was like an early start. Male, 10th grade

On a more cognitive level, one student said that yoga inspired dedication to regular practice in sports.

I definitely benefited from yoga classes. I am not very flexible and yoga classes helped with running and track season to loosen up muscles. I also have a poor ethic doing something on a regular basis so yoga classes helped with dedication. Male, 9th grade

176	Bodily Awareness. An important principle of yoga “is learning	ally reactive and an increase in the ability to witness their own	176
177	how to be fully present in the moment-by-moment experience	negative feelings with detachment.	177
178	of being alive. In the beginning stages of practice, Kripalu yoga		178
179	uses a combination of yoga postures and breath awareness to		179
180	teach you how to bring yourself <i>fully present in your body</i> ” (11-	I used breathing outside the classroom in my life to calm	180
181	12). ²⁹ Through yoga postures and experiential exercises, many	me down . . . if I was stressed or angry I would then do the	181
182	students reported a greater kinesthetic awareness of their body’s	breathing to calm me down and I will probably continue to	182
183	feelings and physical states.	do this . . . I was less anxious about school in general but	183
184	I learned how to pay attention to how my body feels . . .	didn’t notice a difference in class . . . it was more of a	184
185	Female, 9th grade	change in how I was feeling. Male, 10th grade	184
186	For some subjects this process of physical awareness led to a	Yoga relaxed me, made me much calmer, I was less	185
187	greater respect for their body and improved self-image. The prac-	grouchy, less snappy towards people and I don’t have as	186
188	tice of mindfulness on the body brought about an increase in	much of an attitude with my mom as I use to. Female, 9th	187
189	conscious decision making. For example, one subject offered:	grade	188
190		Many used the technique to curb their negative emotions; how-	189
191		ever, some used the practice to increase positive emotions as	190
192	Respecting how my body works . . . the poses helped with	well. These students felt that learning yoga allowed them to be	191
193	gaining control over myself . . . learning how to work up to	more optimistic in their outlook both at school and at home.	192
194	more challenging postures . . . learning how to allow my		193
195	body to catch up instead of just going for it . . . I am known	. . . Having yoga woke me up . . . it was like something hit	194
196	for just going for it . . . yoga gave me a new perspective on	me over the head and said “yes you can . . . you just need to	195
197	my body and I have more control that I thought I did.	work at it. Male, 9th grade	196
198	Male, 9th grade	Doing yoga helps me be more positive . . . Male, 10th	197
199	Through this awareness, one student noted positive changes in	grade	198
200	diet and habitual food choices.	I have been a lot more happier lately . . . I feel like a better	199
201		person, making better choices, and staying out of trouble.	200
202		Male, 9th grade	201
203	I have been eating healthier, more fruits and vegetables and		202
204	not a lot of junk food; [for example] ice cream and candy	Stress Reduction. Many students reported the belief that stress	203
205 Female, 9th grade	is largely self-induced, caused by their own patterns of thought.	204
206		Of those who noticed mental benefits from the yoga, many cited	205
207	Mental Health. Most students focused less on the physical	the ability to relax and breathe, or focus on something else when	206
208	benefits of yoga as an exercise, and more thought of the practice as	they are stressed. Equanimity increased as well, as one female	207
209	a mental and emotional tool. Correspondingly, benefits re-	student grade 10 said: “I learned how important just letting	208
210	ported by these students were less about the body and more	yourself be is.”	209
211	about the mind. The major areas of change reported were sleep,		210
212	emotional regulation, and stress regulation, and a reduced inter-	If you were tensed up or stressed out, some things in class	211
213	est in substance use.	helped out, feeling a little calmer . . . relaxed . . . some of the	212
214		deeper stretches would feel good and made you feel relaxed	213
215	Sleep. Some students reported poor sleep quality: difficulties	and calm afterwards. Male, 10th grade	214
216	going to sleep, remaining asleep, waking up, and not getting	If you had a lot of stuff on your mind or something you	215
217	restorative sleep from the time they spent in bed. However, for	could just use some of those exercises . . . I just felt calmer	216
218	most students with sleep difficulties, yoga augmented the quality	and stuff, if I was stressed out or angry for some reason, I’d	217
219	and duration of their sleep. Many of them used yoga postures	use that at some point. I’d do their breathing exercises and	218
220	and breathing to aid in falling asleep at night and/or waking up	they’d calm me down. Male, 10th grade	219
221	in the morning.		220
222		Interest in Substance Use. Our study team was particularly in-	221
223		terested in the relationship between yoga practice and the risk of	222
224		alcohol and drug use; thus, we included a directed question as	223
225		part of the interview agenda (Figure 1). Most of the sample	224
226	Yoga definitely helped with sleeping . . . it would take me a	responded “yes” or “maybe” to this question. As the program	225
227	long time to get to sleep. When I was doing yoga it was	was not aimed at reducing drug use, it is not surprising that 44%	226
228	much easier to fall asleep and stay asleep. Female, 10th	answered the question “no.”	227
229	grade		228
230		Academic Performance. Most students reported very little di-	229
231	Emotional Regulation. Another common mental benefit is the	rect effect of the yoga program on their grades. However, some	230
232	increased ability to dispassionately observe and control emo-	subjects did report that yoga helped relieve academic stress and	231
233	tions. Of those students who mentioned mental benefits, many		232
234	of them referred to a decrease in their tendency to be emotion-		233

235 **Question:** Some people who do yoga say that practicing it makes them less interested in drugs
236 and alcohol. Do you think this is true?



247 **Figure 1.** Yoga practice and interest in drug use among yoga students interviewed (n = 28).

237 **Selected Quotes:**

238 *"A lot of my friends ... start smoking*
239 *[cannabis] because they're not*
240 *satisfied with how they feel or their*
241 *life right now... I can imagine that by*
242 *starting to do yoga you feel so much*
243 *more self-fulfilled... something about*
244 *it makes you just feel fuller... I think*
245 *yes [it would reduce drugs and*
246 *alcohol use]."* Female, 9th grade

247 *"I know some people take drugs and*
248 *stuff to relax, but I'm sure that it*
249 *doesn't relax them as much as yoga*
250 *would."* Female 9th grade

251 *"Yes...yoga makes your body feel*
252 *better, more energetic, and happy..."*
253 *Male, 9th grade*

254 improve overall attitude about school. For example, many of the
255 yoga techniques that relieve stress were used before tests. As a
256 female 9th grader said, "I used alternate nostril breathing before
257 a test and it helped . . . I did well on the test." Another female 9th
258 grader mentioned that before a test several students, instead of
259 cramming on test material, were cramming on yoga breathing
260 techniques: "Before a test people would say 'How do we breathe
261 again, is it the inhalations longer than the exhalations?'" An-
262 other female, grade 10, confirmed the importance of breath
263 control before exams: "Before you're taking a test . . . relax and
264 breathe and you don't get as nervous or as tense."

265 Other students found that having yoga during the day im-
266 proved their ability to focus and concentrate in class and feel
267 positive and energized about the rest of the day. As a freshman
268 girl said:

269 It was so relaxing and I go out of [yoga class] feeling so
270 energized and ready to take on the rest of the day where
271 usually [halfway during the day] is when I'm feeling like
272 'Ugh I wish I didn't have to go to class, I just want to go
273 home, I just want to sleep.' But it totally made the day so
274 much better. It was so great.

275 Another 10th-grade female student agreed: "It was nice to be out
276 of a desk and blackboard environment and nice to come to yoga
277 class to regain focus from tiredness and boredom of school."
278 Similarly, "Yoga is a break, rejuvenation, and when I return to
279 class after yoga I am refreshed and have a new outlook on things"
280 (Female, 10th grade).

281 **Social Benefits**

282 Some students reported a greater depth in their relationships,
283 both at home and in school, in two ways: (1) stemming directly
284 from the yoga practices themselves, for example feeling positive

254 experiences while showing a family member how to do yoga, and
255 (2) reports of greater social cohesion, or fewer divisions, among
256 student and family groups as an indirect benefit of the practice.
257 For instance, doing yoga together increased friendship and
258 goodwill among some students. As a 9th-grade male student
259 said:

260 I liked being able to do the class with classmates . . . I was
261 worried about what my friends would think of me as I am a
262 new student to the school this year . . . it was interesting to
263 watch me close my eyes and be comfortable enough to
264 close my eyes in a room full of peers was a good experience
265 . . .

266 Another 9th-grade student noted that she "got closer to the other
267 kids in the class." She also noticed that her "friends who are
268 doing yoga with me are kinder" and "if they are mad or annoyed
269 they breathe before talking." She further noticed, "My relation-
270 ships with people are getting stronger." As she explained, teach-
271 ing some of the yoga techniques to her sister and cousins
272 "brought us closer."

273 There are similar insights from other students. A 9th-grade
274 female stated: "One of my friends who's also in the yoga class,
275 we've been able to talk more and stuff and she also thought it was
276 fun and we've sort of bonded a bit." The aspects of class that
277 included peer-teaching a pose strengthened relationships as a
278 10th-grade female shared: "I enjoyed teaching my peers yoga
279 postures in class and it was a cool way to get everyone interacting
280 and being comfortable sharing with what I learned." One 10th-
281 grade student reported that he "showed my dad some stuff that
282 we did in yoga at home" before the two of them work out. He
283 suggests that as a result "maybe my dad gets more involved with
284 my school life."

294 However, this social cohesion from yoga was not the case for
295 all students. Especially with males, there was a sense of peer
296 pressure created around the practice of yoga. As a 10th-grade
297 male student explained, “My friends would complain before and
298 after [class] so there was a lot of peer pressure to not like yoga but
299 it made me more calm.” He continued, “I like it but you know,
300 a bunch of my friends are peer pressuring and stuff . . . they are
301 like ‘yoga sucks’ and all that stuff. I’m like ‘oh I feel relaxed’ and
302 they are like dude how can you feel relaxed?” Another male
303 student mentioned a similar feeling during yoga class, “I didn’t
304 get as much out of it because I was more focused on what my
305 friends would think about me while I’m doing the yoga.” He
306 compared his attitude to others and said, “I feel like I take it a
307 little more seriously than any of my peers, so it’s not really a
308 topic we connect on, except a few of them, and those are the
309 usually the ones I’m friends with already.”

313 INSIGHTS ON DESIGNING YOGA PROGRAMS IN THIS 314 CONTEXT AND POPULATION

315 Bringing yoga into a school environment has unique challenges
316 and opportunities. Questions of implementation, such as,
317 “should classes be mandatory” and “at what time of day should
318 the classes be offered,” came up during several of the interviews.

321 Yoga and PE Class

322 In this study, yoga was offered during the time of PE class.
323 Depending upon the class period, some students had PE com-
324 pletely replaced by yoga during the study, whereas others had a
325 mixture of yoga and PE class. Many students’ feelings about yoga
326 appear to be dependent on their feelings about PE.

327 Those students who enjoyed the active nature of PE generally
328 disliked having yoga. One student mentioned that PE is a great
329 release for students who felt cooped up all throughout the day,
330 whereas yoga itself has a classroom-type feel. Such students men-
331 tioned that PE is a great opportunity for “getting all my energy
332 out”—and yoga’s focus on calming was less helpful for them. Of
333 those who disliked yoga for this reason, many used the word
334 “active” as describing what they sought in their PE experience.
335 For these students, mostly athletic male students, having yoga
336 replace PE class was a negative experience:

338 Some of my friends don’t take so kindly to [yoga] class. It’s
339 just mellow and they like to be active. Male, 10th grade

341 One male student reported dropping out of the study for this
342 reason. However, some of these students valued the yoga option
343 if placed in a different context:

346 It’s not that I don’t like yoga I would just rather be playing
347 basketball or working out at the gym than doing yoga.
348 Basketball is more active. Maybe I would try yoga again if it
349 was not competing with sports. Male, 10th grade

351 In contrast, some male athletes appreciated yoga as a replace-
352 ment for typical PE class.

294 It’s cool that you’re doing something about this, having
295 something better than just running around outside for gym.
296 It usually ends up in our gym class just walking around
297 outside or just sitting down. Male, 9th grade (track)

298 The same student appreciated the opportunity to do something
299 “more beneficial” with his time in PE.

300 For many other students PE is not interesting or active. As a
301 freshman girl said: “I don’t think I get anything out of gym class
302 at all. There are all these senior guys playing basketball and I’m
303 not going to play with them.” Another female student in 9th
304 grade said, “I had a lot of fun with [yoga] because I hate playing
305 sports and I hate normal PE class.”

306 Nearly all students had a favorable impression about offering
307 yoga class, but most wanted the freedom to select between at-
308 tending traditional PE, yoga, or spending their time sitting out or
309 studying. (During the study, staff discovered that students had
310 the option of not participating in PE at this site without neces-
311 sarily failing class. Thus, some students had grown accustomed
312 to the cultural context of PE as study hall.)

315 Continuing Yoga Practice

316 Most students reported that they would continue to practice
317 yoga if it is offered in school (Figure 2). However, most students
318 would not continue to practice yoga if they had to locate their
319 own studios and pay for it. A female student who practices yoga
320 outside of class mentioned that her yogi friends from other
321 schools were a little jealous that she gets free classes in school.
322 The most commonly mentioned issue stopping students from
323 practicing yoga outside of school is the lack of time. Yoga as part
324 of the school day also offered a break. As a 10th-grade male
325 student said yoga calms him and helps with “forgetting about the
326 problems in my life” because it is “something different to think
327 about in the moment.” He explains, “That period I was able to
328 calm down a little bit.”

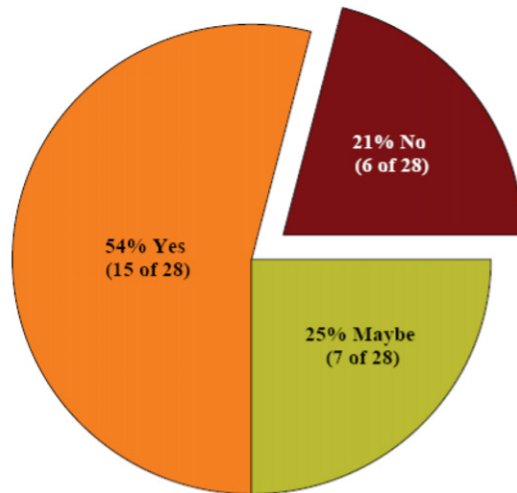
329 The desire to continue yoga appeared to be results driven.
330 Most of the students who saw benefits, either physical or mental,
331 wanted to continue their practice in some form.

333 I was motivated and inspired to practice yoga outside of
334 class at home. It was great to have a form of exercise I found
335 enjoyable and that felt good. I noticed myself changing: an
336 increase in self awareness and it felt like instant gratifica-
337 tion. Female, 10th grade

338 Most subjects who saw benefits reported particular aspects of the
339 yoga curriculum that prompted desire to continue yoga practice:
340 flexibility, balancing, relieving soreness from athletics, doing
341 activities with peers, yoga games, student-led teaching exercises,
342 relaxation poses and postures, learning stress management, and
343 improvements in mood. Some students enjoyed having yoga as
344 an option for a particularly stressful time, and many athletes
345 liked having it as an option for game days and before sports
346 practice. One male in grade 9 stated that “I am fascinated by the
347 culture of yoga, how people can change their lives and help
348 themselves physically, emotionally . . . I am interested in learn-
349 ing more.”

351 A few students talked about the process of realizing that yoga
352 is beneficial for them. For example, a 9th-grade male said: “In the

Question: If it were possible would you like to continue yoga classes in school?



Selected Quotes:

"I would like to continue because I noticed the changes; it made me not as tense and stressed... it definitely helped with [track]... it made me less sore." Female, 9th grade

"Yes...but I can't...don't have enough time..." Female, 9th grade

"Maybe if something happened and I was in a stressful time I would take yoga." Male, 10th grade

Figure 2. Interest in continuing yoga practice among yoga students interviewed (n = 28).

beginning I didn't like [yoga], but over time, in the middle I started to notice results . . . I began to like it because it started to work . . ." The results he most valued were the "calm" when he talks to people, the improvements in his mood, and the increased stress management skills. Another male, grade 10 said nearly the same thing, "At first I was dreading going to class but in the middle I started to like coming to yoga class."

Some students who noticed benefits admitted that they probably would have never tried yoga had it not been mandatory for them. As a 10th grade male said, "I think it should be a choice to take yoga . . . I probably would not have chosen to take yoga . . . but I am glad I took the program."

INSIGHTS INTO RESEARCH IN THIS POPULATION

Our last set of interview questions queried the students' experience with the study and the measurement techniques used. The qualitative interview data revealed some areas of weakness and strength in our research design and techniques for working with this population.

Completing Self-Report Surveys

When students were asked to reflect on the quantitative data collection process, nearly all reported that they were able to understand the quantitative questionnaire and felt the questions were straightforward and clear. All reported comfort with asking the research assistants for clarifications around the research process. Yet, nearly all of them found the quantitative questionnaire to be far too long. Many of them lost emotional interest and felt "frustrated" at the number of similar questions. They called these "how do you feel" questions "unnecessary," a "nuisance," and "kind of pointless." To them, it felt they were being asked "the same question over and over and over again." Many students mentioned that others "probably" did not give honest answers because of how quickly they went through the questionnaire, perhaps even choosing answers randomly in order to complete the process as soon as possible.

Along with the "how do you feel" questions on the surveys, most students who were interviewed had a hard time answering indirect or abstract questions such as "How do you think yoga works?"

Subjects preferred the in-person interview to the questionnaire both in terms of accuracy and convenience. As one grade 10 female said, "A lot of the questionnaires people answering what they think the study people want to hear not how they actually feel or think. It was really long. Asking the same question over . . ." Another grade 9 female echoed that statement, "Probably a lot of people didn't do true questions on the packet . . .".

DISCUSSION

Little is known about the use of yoga by youths. This qualitative analysis explores the experiences of students participating in the treatment arm of a 12-week in school yoga trial. We asked students about: (1) the practice of yoga within the school curriculum, (2) perceived benefits of yoga, and (3) participating in a research study. The students reported individual benefits (such as improved academic and athletic performance), social benefits (such as reduced reactivity to stressful social situations), suggestions to improve the design of future programs (such as more choice or variety in classes), and how to improve the quality of research with this population (such as reducing the length of the quantitative measurement packet).

The students also offered a few suggestions to improve the feasibility of research in this context. Some of the students reported that 12 weeks of continuous classes is burdensome to 9th graders. Breaking up the intervention into smaller segments may be more feasible and this modular format is more similar to traditional activity units in PE curricula (which can last several weeks to a month). In addition, by distributing the yoga program throughout the academic year, students will not be deprived of other PE activities. This modular format may actually improve

412 benefits, for there may be a degree of integration of experience
413 between sessions that ultimately strengthens the intervention.

414 Similarly, some of the students mentioned that the task of
415 filling out measurement forms was too laborious and some ques-
416 tions were repeated. Although it is not unusual for study subjects
417 to complain about repetition and subject burden, because we
418 used validated scales there was some overlap in questions as
419 similar questions can be used to address divergent constructs.
420 Our measurement packet is lengthy, containing 244 questions
421 and 13 measures and taking approximately 60 minutes to com-
422 plete. Still, we can help remedy student criticisms in future ad-
423 ministrations by administering the forms in a modular format,
424 reducing the number of forms offered by targeting our ques-
425 tions, and better explaining to the students that we want to use
426 scales that other scientists recognize.

427 Most of the students reported that they liked the yoga pro-
428 gram, whereas a few would prefer something more physically
429 active or without a classroom feel. As we think about the design
430 of future programs it is important to consider the viewpoints of
431 these students, most commonly athletic males, who prefer a
432 more rigorous routine. In future translational studies, perhaps
433 yoga could be included within health and wellness classes so that
434 yoga does not substitute for sports but instead is an optional
435 physical education class. More importantly, that many of our
436 student athletes reported yoga improving their physical perfor-
437 mance and injury prevention raises the possibility that yoga may
438 comply with national, state and local PE requirements for phys-
439 ical fitness and indeed, other studies on yoga for youth that have
440 specifically measured physical outcomes support this possibility,
441 reviewed in Galantino.²³

442 Students reported many positive aspects to the classes. Yoga
443 postures, the physical stances that most people think of when
444 they think of yoga, were important, whereas breathing was the
445 most frequently cited tool that athletes applied outside of yoga
446 class; this was true for the nonathletes as well. This finding
447 suggests that yogic breathing practices may be a key tool for
448 physical, mental, and emotional health that all high school stu-
449 dents can take “off the mat” and into their lives. Indeed, studies
450 in adults have shown changes in brain activity and reductions in
451 oxidative stress following yogic breathing practices.³¹⁻³³ Further-
452 more, breathing is easily taught and easy to practice. Future work
453 considering the efficacy of teaching yogic breathing practices
454 alone, not just in a physical education setting but in any class-
455 room is needed.

456 Body awareness also increased among many interviewed stu-
457 dents, which warrants further study into aspects of physical and
458 mental health relating specifically to body image in adolescent
459 populations. The interviews revealed two themes within body
460 awareness: overt tuning into the body (kinesthetic sensitivity)
461 and being kind to one’s body (self-acceptance and self-compass-
462 ion); improvements in self-compassion have been found to
463 result from other Kripalu yoga programs,³⁴ suggesting that this
464 may be a mechanism of change associated with yoga practice.
465 Furthermore, despite lacking any reference to healthy eating
466 behaviors in the present study’s yoga curriculum, one inter-
467 viewed student also reported changes in eating habits from par-
468 ticipating in yoga classes. Considering our found responses
469 about body awareness and dietary changes, future work should
470

412 evaluate yoga’s ability to mitigate or prevent childhood obesity
413 and disordered eating habits; a next research step supported by
414 other published work.³⁵⁻³⁷

415 In addition, students reported that the program met them
416 where they were and felt benefits appear to be context depen-
417 dent. For example, students spoke of either academic or athletic
418 performance, not both, suggesting that those who focused on
419 athletics found yoga benefit there while those that focused on
420 academic performance found yoga benefit there. This could also
421 be a result of the developmental stage of adolescence; that is,
422 these students may not yet be thinking in a mind–body manner,
423 instead focusing on one level of experience or the other. An-
424 swers, too, appear to be highly influenced by social context.
425 Specifically, students who enjoyed yoga and felt their social
426 group did as well were more vocal about the benefits of yoga,
427 whereas students who were part of a social group that did not
428 enjoy it were more prone to keep their opinions quiet. The
429 resulting group censorship may increase the time it takes stu-
430 dents to realize any benefits; future work might consider a long-
431 term follow up interview series to capture changes that become
432 evident after the din of peer pressure or a particular social con-
433 text fades. We also found evidence that yoga can help students
434 manage this potentially challenging developmental time and for
435 some students, yoga may have supported physical fitness more
436 so than the traditional PE curriculum. Future work might con-
437 sider how to best harness these positive qualities of a yoga pro-
438 gram to develop physical education programs that led to the
439 most student benefit.

440 Finally, we found evidence that the practice of yoga may lead
441 to emergent positive health behavior changes, even when such
442 changes are not directly prescribed by the yoga program. This
443 is an exciting finding for it suggests that a yoga practice can help
444 students make positive choices; for example, most students re-
445 ported that yoga practice may decrease the risk of use of alcohol
446 and drugs. Emergent behavior change is a future area of concen-
447 tration for us, along with how these changes happen and how
448 skills may be maintained into adulthood. Our findings support
449 yoga’s potential to improve mental and physical health at the
450 individual level, which can dramatically improve youth’s ability
451 to make positive choices, which collectively can positively affect
452 our society.

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APPENDIX A

Date of interview: _____
Interviewer: _____
Subject Initials: _____
Treatment or Control group _____

Introduction:

- Thank you for coming in for this interview

530	● Purpose:	530
531	To explore how you think about yoga. Hear your experi-	531
532	ences of the program. Learn more about your experience	532
533	that we may have missed on the questionnaires	533
534	● Confidentiality:	534
535	Your answers will never be linked to your name. You will	535
536	remain anonymous. Only study staff will have access to	536
537	the recordings and transcripts.	537
538	● These interviews usually take about 30 minutes.	538
539	● If there are any questions that you do not want to answer	539
540	please let me know.	540
541	● Do you mind if I tape the interview? Yes/No (turn on	541
542	recorder)	542
543		543
544	1. Experience-narrative of classes:	544
545		545
546	● Please tell me how the yoga classes were for you? (If no	546
547	spontaneous narrative: Please tell me any stories from the	547
548	yoga classes	548
549	● What parts of the classes did you like? (Probe: time-in,	549
550	breathing exercises, postures, games, partner poses, rest	550
551	pose)	551
552	● Is there anything you would change?	552
553	● Did you learn anything new in the yoga classes?	553
554	● Is there anything you would like to learn more about?	554
555		555
556	2. Have you seen any changes in your life because of the yoga?	556
557		557
558	● (Probe if not mentioned one at a time, have you seen any	558
559	changes?)	559
560	● How about your sleep, mood, anxiety about school, be-	560
561	haviors like paying attention?	561
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	● Have you noticed any changes in your health?	
	● Have you noticed any changes in relationships-how you	
	feel about people and interact with them, or how they	
	interact with you?	
	● Have you used any of the tools that you learned in yoga	
	class in other areas of your life?	
	● Have you seen any changes in your friends' behavior that	
	might be due to the yoga?	
	● Some people who do yoga say that practicing it changes	
	other behaviors too. Do you think that this is true?"	
	● How do you think yoga works?	
	3. Administration-Joining the study:	
	● How do you feel now about having joined the study?	
	● How do you feel about the questionnaire packet? Length,	
	time to complete, etc.	
	● Did you understand the questions being asked . . . if No	
	what didn't you understand?	
	● Are there any changes should we make for next time?	
	4. Closure:	
	● If it were possible would you like to continue yoga classes?	
	● What would you change for next time?	
	● Is there anything else you'd like to say about this?	
	● Do you have any questions?	
	● How was this interview for you?	
	5. Observational notes (interviewer: Please record any body	
	language, other cues):	