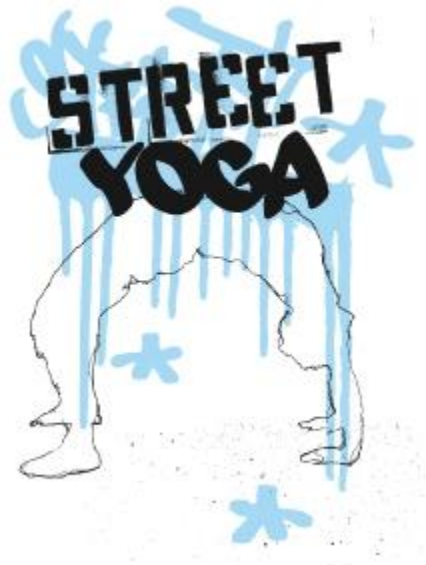


Yoga as an Adjunct Therapy for Teens and Adolescents:

A Pilot Study



Street Yoga

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Introduction

In the U.S., yoga is increasingly offered as an adjunct therapy for people who have experienced trauma and for individuals with mental illness. Due to the growing popularity of yoga as a therapeutic tool, researchers within psychology, social work, and neuroscience are investigating the impacts of yoga. These researchers have found that yoga creates resiliency in the autonomic nervous system, thereby reducing stress and anxiety. Additionally, through increased internal awareness, individuals experience changes in Heart Rate Variability allowing them to more effectively regulate affective emotional states (Emerson and Hopper, 2008).

Current research examining yoga as a therapeutic intervention primarily involves adults as participants. In 2011, Street Yoga partnered with Ryther Child Center, where they provided yoga classes as an adjunct therapeutic service to Ryther's Sub-Acute and Chemical Dependency residential programs. In an effort to understand youth perceptions of changes experienced after taking the yoga classes, the two organizations decided to implement a pilot study.

The purpose of this study was multifaceted. First, the organizations hoped to determine if youth who attended the yoga intervention self-reported any change in body awareness and resiliency. Second, the organizations sought to assess the validity of the survey employed at pretest and posttest given a wide age range in participants (6 years old -18 years old). Third, Street Yoga wanted to evaluate the feasibility of a pretest/posttest model for this population given resource limitations. An additional aim was to contribute to a limited body of research investigating yoga as an adjunct treatment for youth with mental illnesses and chemical dependency.

Specifically, the project aimed to determine if youth that attend Street Yoga classes would self-report changes in body awareness and resiliency. In addition, would staff reports, based on staff observations and interactions with the youth; corroborate what the youth in the Sub-Acute Program self-report? Street Yoga hypothesized that youth that attended more street yoga classes would self-report higher levels of the above-mentioned categories.

Methods

The pilot study is a pre-experimental, one-group pretest-posttest design (Royce, 2011). The surveys track intervention, attendance and perceptions of body awareness and resiliency. The intervention was a series of yoga classes (typically 6 – 8 classes), taught once per week. Yoga teachers are volunteers trained by Street Yoga to teach trauma-sensitive yoga for youth.

Sampling

There were two target populations for this study, teens in residential treatment for chemical dependency, and youth removed from their homes due to severe abuse or neglect that often have co-occurring mental illness and behavioral issues (i.e., Sub-Acute). Staff at Ryther selected the sample from the Sub-Acute Program based on two factors: youth who staff perceived would get the most benefit from the class, and youth who would contribute to overall group cohesion. The group changed periodically (every 4-8 weeks) and the classes lasted 30 minutes. The teen boys in the Chemical Dependency Program self-selected to attend yoga class (versus an alternate physical activity), and

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could change their choice each week. The yoga classes with the Chemical Dependency CD group lasted one hour. The sample for the CD group was 24 males who ranged in age from 14 – 17 years old. The Sub-Acute (SA) group was comprised of 21 youth—4 females and 17 males who ranged in age from 6-14 years old. Additionally, staff at Ryther Child Center were asked to complete shortened versions of the same surveys to assess their perceptions of youth in the Sub-Acute program before and after the youth finished a session of yoga intervention.

Table 1, below, shows the total number of youth who completed pretests, posttests, and both pre and posttests. Given the small sample size, and that there is no control group, the kind of analysis that can be done is limited.

Table 1

Total Number of Surveys Completed:			
	Pretest	Posttest	Pretest and Posttest
Chemical Dependency Program	96	37	24
Sub-Acute Program	41	47	21

Instrumentation and Materials

Street Yoga partnered with Ryther to develop an 18 item Likert Scale questionnaire that was administered at pretest and posttest. The questionnaire consists of two parts: first, an 11-item body awareness and emotional regulation scale, followed by a 7-item resiliency and emotional regulation scale.

Chemical Dependency Program. The CD group received the above-mentioned questionnaire with five-answer options for the first 11 questions (0 – never, 1- rarely, 2- sometimes, 3 – often, 4 – always, 5 – don’t know); and four-answer options for the following 7 questions (1 – not at all sure, 2 – sort of sure, 3 – very sure, 4 – don’t know).

Sub-Acute Program. Initially, youth in the SA group were also given the same survey as the teen boys in the CD program. Early on, however, staff recognized that the questions were too conceptual and the answer options were confusing for the youth in the SA group. To address this, answer choices for the Sub-Acute questionnaire were conflated into three options (1 –rarely, 2 – sometimes, 3 – often) and the language was edited slightly to maintain the same concepts, but provide more simplistic language and concrete examples to the youth. As the study progressed, researchers still had concerns related to validity, and therefore the first 11 items related to body awareness were removed from the questionnaire. These questions seemed to be too abstract for the youth. Instead, youth completed a coloring activity in which they colored in a hollow body outline based on where they felt specific emotions in their own bodies. Additionally, the language on items 1b – 7b was changed to be more age appropriate.

Variables in the Study

The dependent variable is the youth perceptions of body awareness and resiliency. The independent variable is yoga class attendance.

Data Analysis

Feasibility

Table 1 illustrates that, given the resources of Street Yoga and the nature of the populations being served, it was difficult to ensure youth completed both a pretest and posttest. This difficulty resulted in a small sample size, which limits the extent of data analysis that can be done. Additional limiting was the research design, as well as overall validity and reliability, which are addressed in limitations section of this paper.

Mean Response Scores

Table 2 shows the mean scores for youth in the Chemical Dependency Program and youth in the Sub-Acute Program. Youth in the SA group reported a slightly lower mean score on the first scale (questions 1a – 11a) at posttest, while youth in the CD group reported a slightly higher mean score on the first scale. Both groups self-reported average scores slightly higher on the second scale (questions 1b – 7b, related to resiliency) at posttest. As noted above, the Chemical Dependency Program surveys were based on a five-point scale (0 – never, 1 – rarely, 2 – sometimes, 3 – often, 4 – always, 5 – Don’t Know), while the Sub-Acute Program surveys were done on a three-point scale (1 – never or rarely, 2 – sometimes, 3 – often or almost always).

Table 2

Pre and Post Means				
	Pretest Mean Items 1a – 11a	Posttest Mean Items 1a – 11a	Pretest Mean Items 1b – 7b	Posttest Mean Items 1b – 7b
Chemical Dependency	2.769	2.790	2.548	2.68
Sub-Acute Program	2.3	2.207	2.595	2.619

It is notable that the mean scores on the pretests for youth in the Sub-Acute intervention were 2.3 and 2.596 out of 3, indicating that youth self-reported high scores from the start. This is important for future data collection with youth of this age. There are many possible reasons for this high initial score; the survey may not have been age appropriate for the Sub-Acute program, youth may not have been paying attention while taking the survey (as interviewers reported was sometimes the case), youth may have lacked insight into their own processing, or this particular sample of youth may have had higher-than-expected skills from the start.

The comparison of pretest and posttest mean, or average, responses by item, show that on average, youth in the SA group reported lower scores on all items except 6 of them (see Chart 1). In contrast, teens in the CD group on average self-reported higher responses on almost all items (see Charts 2 and 3). This finding may also suggest that the survey questions were not age-appropriate for youth in the SA group.

Chart 1

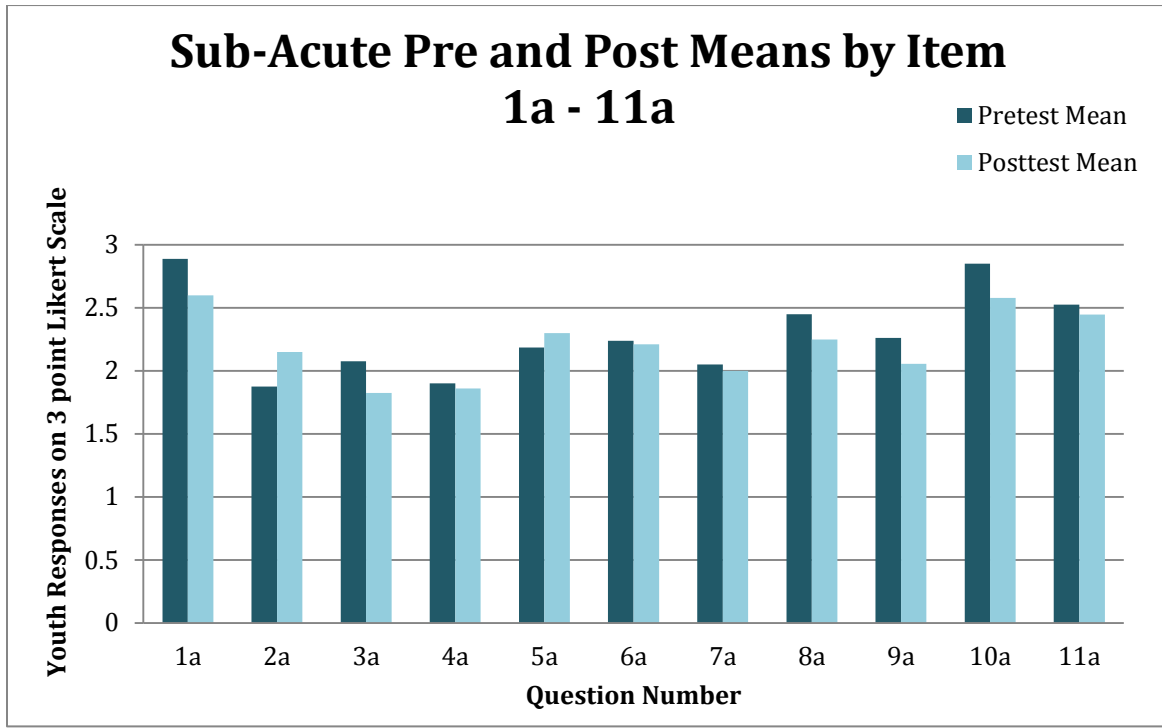


Chart 2

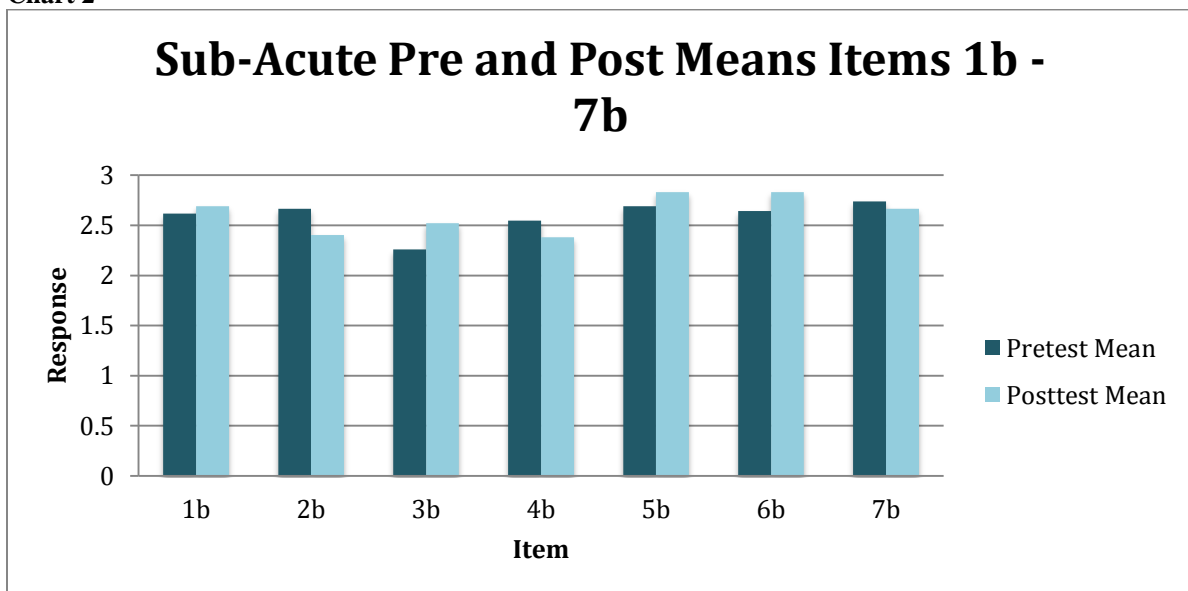


Chart 3

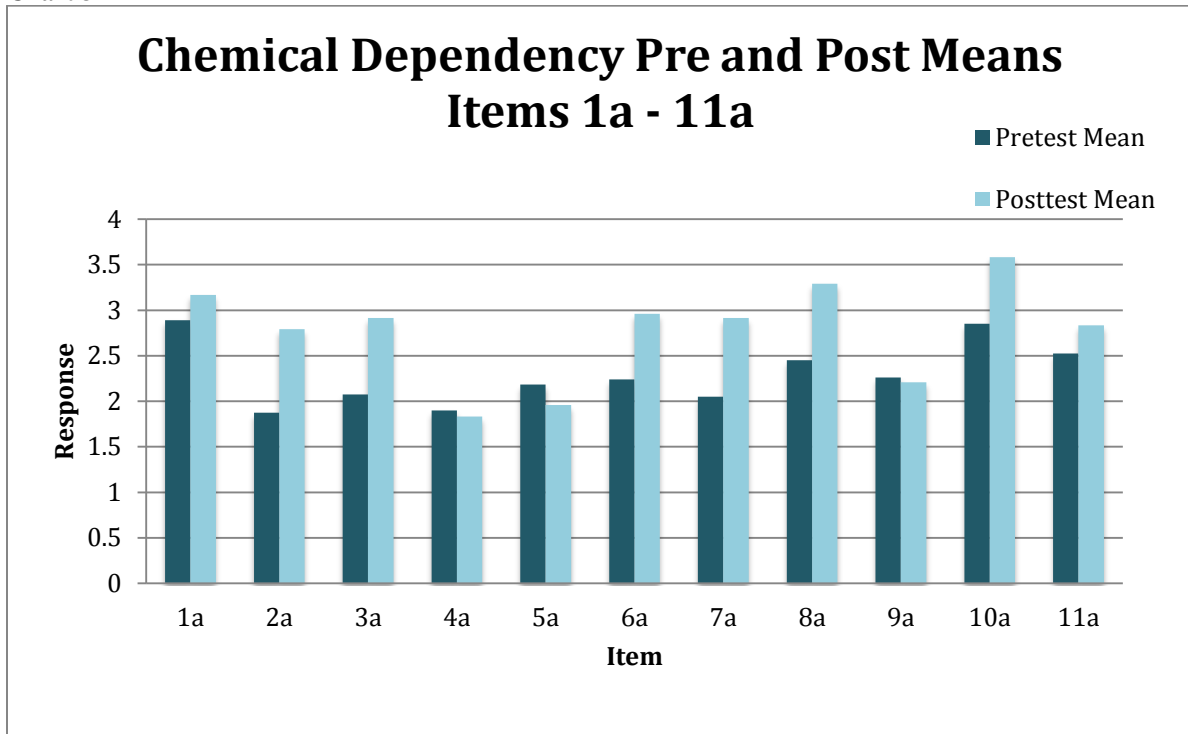
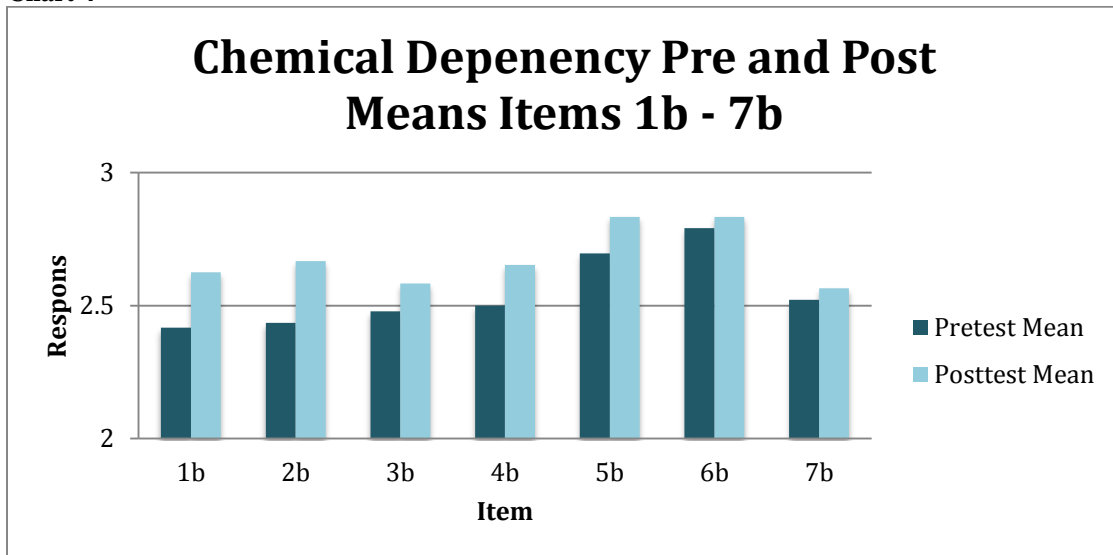


Chart 4



Body Awareness

The majority of youth in both groups self-reported on the pretest and on the posttest that they almost always or often felt safe in their bodies and felt that their bodies were strong and capable. In the CD group, youth reported higher responses on average on the posttest indicating improvement on this item despite the high responses given on the

pretest. On average, youth in the SA group reported lower responses to feeling safe in their body on the posttest; however, it is unclear how well youth in the SA group understood this question. Interestingly, research indicates that survivors of trauma often “come to feel unsafe in their body” (Herman 2008). Directly asking a child in the SA group how safe they feel in their body could be too conceptual of a question. However, asking the youth in the CD group does seem to be age appropriate and there was an increase in mean response scores on the posttest (3.583) despite a high average response score (2.85) on the pretest.

Further, youth who experience trauma often have overactive stress responses in which the physiological stress responses that are normal for intensely threatening situations are activated by mild stressors (National Child Traumatic Stress Network, 2012, p.3). Youth in the CD group self-reported the most improvement from pretest and posttest on item 2a, “You notice feelings without having to react to them”, in terms of mean score and the percentage of youth who reported improvement. Average self-report increased from 1.875 on the pretest, to 2.799 on the posttest—37.5% (see table 3) of youth in the CD group reported improvement on this item. This is noteworthy as lack of ability to emotionally self-regulate is one of the most prominent features of youth who have experienced trauma (van der Kolk, 2003, p. 298).

Furthermore, youth in the CD group self-reported higher average responses on the posttest regarding their ability to notice overall changes in their bodies, like their hearts’ beating and muscles tensing, in addition to noticing changes in their bodies when they feel upset. The National Child Traumatic Stress Network (2012) reports that youth who experience childhood trauma often suffer from body dysregulation in which they are completely unaware of their physiological sensations. These data suggest that the youth in the CD Program were becoming more aware of their bodies and physiological experiences.

Sub-Acute Emotion Identification. While the questions on the body awareness scale may have been too abstract for youth in the SA group, youth were clearly able to identify where in the body they felt specific emotions through the coloring activity that was implemented at the very end of this pilot study. Youth colored in a hollow outline of a body to demonstrate where they felt sadness, happiness, anger, and worry in their own bodies. On the first survey, four of seven youth identified feeling sadness in their heart, and a common theme in this activity was that a majority of youth drew a heart inside the hollow body outline. One youth reported that they did not feel sadness; this was one of two instances when a youth did not identify feeling an emotion somewhere in the body. Another youth did not identify feeling happiness anywhere in the body. Many of the youth (four of seven) however, identified feeling happiness in the head, while others identified feeling happiness in the heart and the mouth (as some youth drew faces inside the hollow body outline). Youth ascribed worry to many places throughout the body including the hands, legs, feet, head, and heart. Finally, three of eight youth identified feeling anger throughout their entire body, while others reported feeling it their heart and eyes.

On the posttest, all five youth identified feeling each emotion somewhere in the body. Many of the youth again drew hearts and faces on their body outlines. Additionally, some youth included extra shapes on their bodies. For example, one body included stars in the color of happiness inside and outside the body. Other trends included

that 4 of 5 youth reported feeling worry in their belly, and three of five reported feeling worry in their belly and their chest. Additionally, three of five youth reported feeling happiness throughout their entire body.

Individual Items

Table 3 shows that a vast majority of the youth stayed the same or improved on each item. In the CD group, 30% or more youth self-reported higher responses on the posttest for eight of eleven items on the body awareness scale and three of seven items on the resiliency scale. On the resiliency scale, 79% or more of the CD group self-reported the same or improved responses for each item.

It is evident from tables 3 and 4 that youth in the CD program self-reported higher percentages of improvement than did youth in the SA group. This may be in part due to the fact that youth in the SA group rated themselves so highly in the first place.

Table 3

Chemical Dependency Changes in Pre and Post by Question

How often do you feel that:	Stayed the Same	Improved	Percentage Improved	Percentage Improved or Stayed the Same	N
1. <i>Your body is strong and capable.</i>	8	8	33.3%	66.7%	24
2. <i>You notice feelings without having to react to them.</i>	10	9	37.5%	79.2%	24
3. <i>You are able to stay focused on the present.</i>	6	8	34.8%	60.9%	23
4. <i>It is easy for you to get upset (reverse coding).</i>	9	6	25%	62.5%	24
5. <i>You strike back when someone upsets you (reverse coding).</i>	10	8	33.3%	75%	24
6. <i>When you get upset, you are able to calm yourself.</i>	12	7	30.4%	82.6%	23
7. <i>When you get upset, you notice what is going on in your body.</i>	8	8	34.8%	69.6%	23
8. <i>You are able to notice changes inside your body, like your heart beating faster or your muscles getting tense.</i>	13	8	33.3%	87.5%	24
9. <i>You are able to use healthy techniques, such as breathing and stretching, to minimize negative feelings in your body.</i>	7	5	20.8%	50%	24

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10. <i>You feel safe in your body.</i>	12	8	33.3%	83.3%	24
11. <i>You can get past problems in your way.</i>	10	7	29.2%	70.8%	24

How sure are you that you can:	Stayed the Same	Improved	Percentage Improved	Percentage Improved or Stayed the Same	N
1. <i>Make good decisions</i>	14	8	33.3%	91.7%	24
2. <i>Cope with difficult situations</i>	13	8	34.7%	91.3%	23
3. <i>Control your emotions</i>	13	7	29.2%	83.3%	24
4. <i>Deal with negative feelings</i>	11	8	33.3%	79.2%	24
5. <i>Try again if you don't succeed the first time</i>	14	7	29.2%	87.5%	24
6. <i>Take care of yourself</i>	15	5	20.8%	83.3%	24
7. <i>Ask for help when you need it.</i>	14	5	20.8%	79.2%	24

Table 4

Sub-Acute Changes in Pre and Post by Question

How often do you feel that:	Stayed the Same	Improved	Percentage Improved	Percentage Improved or Stayed the Same	N
1. <i>Your body is strong and capable.</i>	12	4	20%	80%	20
2. <i>You notice feelings without having to react to them.</i>	10	8	40%	90%	20
3. <i>You are able to stay focused on the present.</i>	4	8	40%	60%	20
4. <i>It is easy for you to get upset (reverse coding).</i>	10	3	15%	65%	19
5. <i>You strike back when someone upsets you (reverse coding).</i>	8	6	32.5%	73.7%	19

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6. <i>When you get upset, you are able to calm yourself.</i>	9	5	25%	70%	20
7. <i>When you get upset, you notice what is going on in your body.</i>	6	7	35%	65%	20
8. <i>You are able to notice changes inside your body, like your heart beating faster or your muscles getting tense.</i>	8	4	20%	60%	20
9. <i>You are able to use healthy techniques, such as breathing and stretching, to minimize negative feelings in your body.</i>	5	5	25%	50%	20
10. <i>You feel safe in your body.</i>	15	1	5%	80%	20
11. <i>You can get past problems in your way.</i>	13	3	15%	80%	20

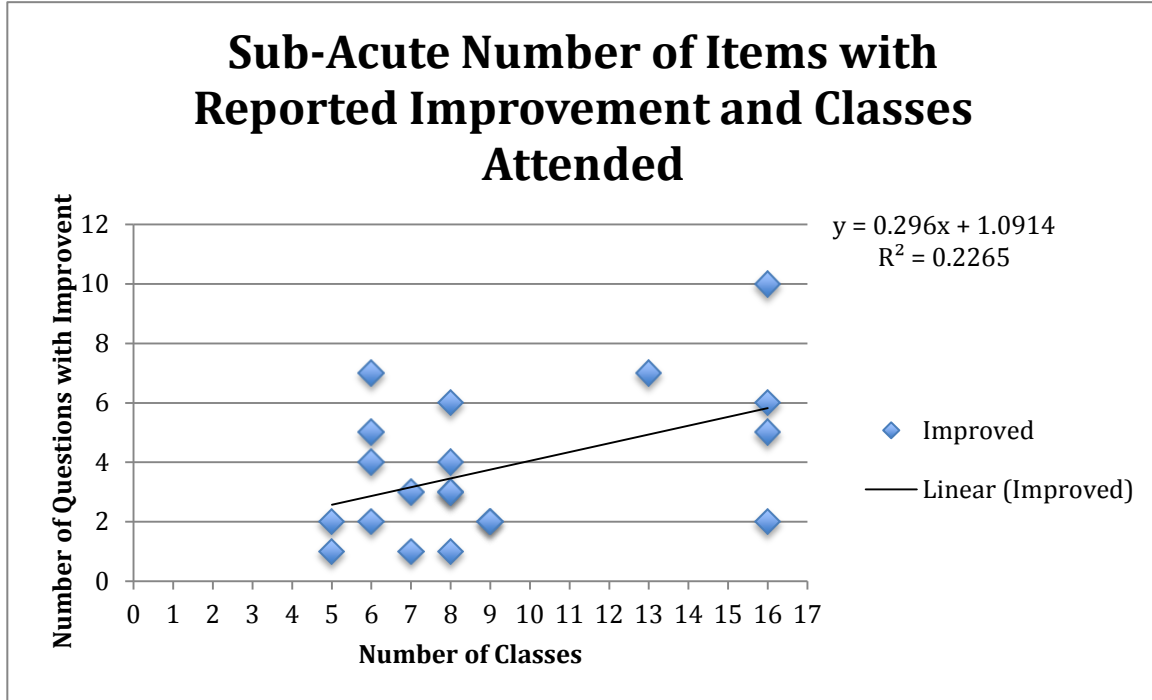
How sure are you that you can:	Stayed the Same	Improved	Percentage Improved	Percentage Stayed the Same or Improved	N
8. <i>Make good decisions</i>	13	5	23.8%	85%	21
9. <i>Cope with difficult situations</i>	14	1	4.8%	71.4%	21
10. <i>Control your emotions</i>	6	9	42.9%	71.4%	21
11. <i>Deal with negative feelings</i>	9	4	19%	61.9%	21
12. <i>Try again if you don't succeed the first time</i>	16	4	19%	95.2%	21
13. <i>Take care of yourself</i>	17	3	14.3%	95.2%	21
14. <i>Ask for help when you need it.</i>	14	3	14.3%	81%	21

Number of Classes and Reported Improvement

A significant number of the posttests for the CD group were missing data reporting how many classes the youth had attended, and therefore a correlation between the number of classes attended and the number of items improved could not be investigated. The SA group had variable levels of improvement with the amount of classes they attended and no strong correlation is detectable (visible in Chart 5).

However, the youth who self-reported higher scores on the most items (10) also attended the most classes (16), while the youth who reported the least amount of perceived improvement (1 item) attended the least amount of classes (5).

Chart 5



Delimitations and Limitations

One limitation encountered was that the data collected from the staff members at Ryther could not be analyzed. The staff members who filled out the pretest were different from the staff that filled out the posttest surveys for each respective youth. Therefore, changes in responses could be due to the each staff member's differing perception of the youth, rather than actual changes in the youth as perceived by the same staff member.

Due to the design of this study (program evaluation within treatment center) there were many limitations to be considered. First, and most prominently, is that no links (correlation or causation) can be made between the independent and dependent variables. This is due to the fact that youth were currently receiving other treatment and there was no control group. Therefore, changes in self-report could either be correlated or caused by the yoga class intervention, or by the treatment the other treatment they are receiving at Ryther Child Center, or a combination of both.

Bias, another influence on validity, is also a limitation of the study. In the Sub-Acute program, the sample was strongly skewed toward male youth—there were only four females, verses seventeen males, who completed pretests and posttests. Additionally, there was a significant number of youth who only took either a pretest or a posttest. Difficulty tracking youth resulted from: youth in the Sub-Acute program having a difficult day and not going to yoga class, youth graduating, and youth running away or

otherwise being removed from Ryther programming. These issues led to a small sample size, which inhibited researchers from drawing any statistically significant results.

Another limitation of this study is that no data was collected that reflected the level of participation of each youth in the yoga classes; only how many classes they attended. Similarly, there was no ability to determine the content of each yoga class and if yoga teachers consistently adhered to Street Yoga's best practices for trauma-informed yoga.

Conclusion

Mean scores by item for youth in the CD group increased on all but two items. Specifically, average responses per item on the first- (body awareness and emotional regulation) scale increased the most. The greatest improvements were reported on noticing feelings without having to react to them (item 2a), ability to stay focused on the present (item 3a), ability to calm oneself when upset (item 6a), ability to notice body sensations when upset (item 7a), and overall ability to notice changes in the body like heart rate and muscle tension (item 8a). These results align with the findings of Bessel Van Der Kolk, who asserts that formal mindfulness practices increase awareness of internal sensory stimuli, gradually allowing individuals to increase their ability to navigate potentially stressful events (Van Der Kolk, 2006, p 12).

As previously mentioned, limitations preclude any conclusive analysis of correlation or causation, however these responses do indicate promise for future research. Despite a small sample size, useful information can still be gleaned if resources provide another opportunity to pilot a survey. Youth ages 11 and up are able to give consistent answers to surveys, and it is possible to get quality data (Borgers et al, 2000, p. 71). In the future, questions should be worded so as to specifically reflect the impact of yoga, or a short 5-item questionnaire could be given before and after each class. Additionally, incorporating a control group would increase validity.

Data from the Sub-Acute program are subject to even greater limitations. Borgers et al. (2000), point out that it is not easy to successfully survey children of ages 8-11. Children at this age still have nascent reading, language, attention, and motivation skills. Additionally, children at this age have difficulty with ambiguous questions. It became evident to interviewers that the original survey was not age-appropriate, and often youth were unable to be attentive while taking the survey, and/or did not fully understand the questions. Therefore, the quality of data collected is restricted. When youth were given the body color map activity it appeared that they were able to comprehend and engage fully with the task. This method for data collection is recommended in the future for this age group. Other means of data collection would be focus groups and group interviews. It is recommended that visual stimuli should be used and tasks should be kept short.

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