



AOTA Critically Appraised Papers Series

Evidence Exchange

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION

What is the effectiveness of the Get Ready to Learn classroom yoga program for children with autism spectrum disorders on decreasing maladaptive behaviors and improving educational outcomes?

Koenig, K. P., Buckley-Reen, A., & Garg, S. (2012). Efficacy of the Get Ready to Learn yoga program among children with autism spectrum disorders: A pretest–posttest control group design. *American Journal of Occupational Therapy*, 66, 538–546.
<http://dx.doi.org/10.5014/ajot.2012.004390>

CLINICAL BOTTOM LINE:

The Get Ready to Learn (GRTL) yoga program is a daily classroom-based yoga curriculum designed by Anne Buckley-Reen for elementary school students (ages 5–12 years) with ASD and/or challenging and maladaptive behaviors. This program incorporates developmentally targeted breathing techniques, yoga postures, chanting, and relaxation techniques into the classroom's morning routine to challenge and suppress maladaptive behaviors. GRTL differs from other school-based yoga programs in that it uses manualization in the form of a DVD to ensure consistency and ease of administration for both participants and instructors. This study provides sound evidence that the GRTL yoga program reduces irritability, lethargy, social withdrawal, hyperactivity, and noncompliance in children with autism spectrum disorders (ASDs). Therefore, incorporating GRTL into classroom morning routines can maximize academic engagement and optimize classroom time for classrooms facing the behavioral challenges of ASD. More information on the GRTL yoga program can be found at getreadytolearn.net.

RESEARCH OBJECTIVE(S)

List study objectives.

The objective of this research study was to examine the effectiveness of a manualized intervention, the GRTL yoga program, among children (ages 5–12 years) with ASD. The GRTL uses yoga postures along with breathing and relaxation exercises to challenge and suppress maladaptive behaviors that interfere with the child's performance in the classroom.

DESIGN TYPE AND LEVEL OF EVIDENCE:

This study used a Level II, single experimental, nonrandomized, pretest–posttest control group design. Two groups of qualified children with ASD were selected from a large urban elementary school in New York City. The intervention group received the GRTL yoga program each morning before the first structured classroom activity of the day. The control group participated in a standard morning activity vs. the GRTL yoga program. The researchers purposefully did not use randomization in their groups to ensure that participants in both groups reflected equal functional levels. Groups needed to be as similar as possible in terms of functional level to ensure the accuracy of results.

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *Circle yes or no, and if no, explain.*

YES/NO

The study design was appropriate. The literature reviewed revealed a history of inherent weaknesses in previous research designs. These weaknesses included insignificant sample sizes, lack of comparison groups, and failure of the research team to manualize the yoga interventions (provide standard protocol). The current study design uses a significant sample size, a control group, and a manualized intervention.

SAMPLE SELECTION

How were subjects selected to participate? Please describe.

The researchers used a convenience sample taken from a large urban public school.

Inclusion Criteria

To participate in the study, students needed to have a diagnosis of an ASD, to be within the elementary school age (age 5–12 years), and to have no known medical conditions that would prevent participation in the GRTL program.

Exclusion Criteria

NR

SAMPLE CHARACTERISTICS

N = 49.

% Dropouts

#/ (%) Male

#/ (%) Female

Ethnicity

Disease/disability diagnosis ASD

Check appropriate group:

<20/study group	20–50/study group ✓	51–100/study group	101–149/study group	150–200/study group
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INTERVENTION(S) AND CONTROL GROUPS

Add groups if necessary.

Group 1

Brief Description	<p>The intervention group consisted of 24 children from a large urban school in New York City that serves over 700 students with autism. The intervention group was then split into 4 classrooms (6 children in each classroom). 3 classrooms were classified as “self-contained autistic support classrooms, and the 4th classroom was a partial inclusion or integrated class whose students spent some time in regular education classrooms.”</p> <p>The intervention group participated in the GRTL yoga program daily for 16 weeks. Before starting the program, each morning, the students aided the teachers and staff in getting the classroom ready, which included moving desks, putting yoga mats on the floor, and placing a large “stop” sign outside the classroom door. Once the classroom was set up, the teacher put in the GRTL DVD. The DVD consisted of the occupational therapist (OT) modeling the yoga program (providing visual and auditory cues). The program combined breathing exercises, physical poses, deep relaxation, and chanting. The program lasted about 15–20 minutes each day.</p>
Setting	<p>The intervention took place in a quiet classroom setting that facilitated decreased distractions. All classroom staff was instructed to remain silent during intervention to decrease environmental distractions.</p>
Who Delivered?	<p>The teachers (1 in each of the 4 classrooms) implemented the GRTL yoga program. Prior to program delivery, each teacher received a 2.5-hour in-service training from the program developer, Anne Buckley-Reen. In addition, intervention classrooms were provided a GRTL DVD on which the OT modeled the yoga program, providing visual and verbal cues. The DVD was used daily.</p>
Frequency?	<p>The GRTL daily yoga curriculum was implemented every school day before the first structured activity.</p>
Duration?	<p>16 weeks.</p>

Group 2

Brief Description	<p>The control group consisted of 22 children (from the same school as the intervention group) who were also split up into 4 classrooms. 3 of the classrooms were classified as “self-contained autistic support classrooms, and the 4th classroom was a partial inclusion or integrated class whose</p>
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	students spent some time in regular education classrooms” (consistent with the intervention group). The control group participated in a standard morning activity. This generally consisted of getting materials and room ready and having a morning meeting–type of group activity, which may or may not have included physical activity.
Setting	The control group morning activity also took place in a standard classroom environment that facilitated decreased distractions.
Who Delivered?	No intervention.
Frequency?	No intervention.
Duration?	16 weeks.

Intervention Biases: *Circle yes or no and explain, if needed.*

Contamination

YES/NO

NR

Co-intervention

YES/NO

NR

Timing

YES/NO

The GRTL program was completed at the same time each day (before the first structured activity) for 16 weeks.

Site

YES/NO

The classroom environment and classroom set-up were assessed using a fidelity implementation checklist to ensure consistency across the 4 separate classes in the intervention group. Each classroom received a “good” rating on the fidelity implementation checklist.

Use of different therapists to provide intervention

YES/NO

1 GRTL instruction DVD was provided to each classroom in the intervention group. Teachers assigned to an intervention classroom received standardized training from the program developer prior to the 16-week intervention.

MEASURES AND OUTCOMES

Complete for each relevant measure when answering the evidence-based question:

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article--yes/no/NR [not reported]), and how frequently the measure was used.

The Aberrant Behavior Checklist (ABC)–Community was used to assess challenging behaviors. Irritability/Agitation/Crying, Lethargy/Social Withdrawal, Stereotypic Behavior, Hyperactivity/Noncompliance, and Inappropriate Speech are the 5 subscales addressed in this assessment tool. The authors reported the ABC Community’s internal consistency at .86–.95

(high), interrater reliability at .63 (acceptable), and test–retest reliability at .96–.99 (high). This assessment was used twice, once before the intervention and once after the 16 weeks of the intervention. Both the teachers and parents completed an assessment for each child before and after the intervention.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article--yes/no/NR [not reported]), and how frequently the measure was used.

The Vineland Adaptive Behavior Scales–II (VABS–II) was completed once for all participants before the intervention to confirm that those in the control group and those in the intervention group were comparable concerning adaptive behaviors. The VABS–II is a parent/caregiver-based interview that assesses independence and proficiency of social, daily living, communication, and motor domains. The authors report internal consistency at .94, test–retest reliability at .88, and interrater reliability at an acceptable .74.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article--yes/no/NR [not reported]), and how frequently the measure was used.

The last measurement tool used was a videotaped observation of each first structured activity that occurred immediately after the GRTL program for the intervention group and immediately after the standard morning activities in the control group in the self-contained classrooms only. The videos were used to record off-task behaviors and frequency of teacher input to redirect for each participating student. Observations were coded in 4-minute intervals.

Measurement Biases

Were the evaluators blind to treatment status? *Circle yes or no, and if no, explain.*

YES/NO

This research study did not allow for blinding of the conditions or the treatment because the teachers were both assessment and intervention implementers, which can create biases.

Recall or memory bias. *Circle yes or no, and if yes, explain.*

YES/NO

Others (list and explain):

It is appropriate to highlight that the interrater reliability for the ABC–Community (which was the pretest–posttest assessment tool) is only .63, which is classified only as acceptable.

RESULTS

List results of outcomes relevant to answering the focused question.

Include statistical significance where appropriate ($p < 0.05$).

Include effect size if reported.

Students who participated in the GRTL program showed significant differences in total ABC–Community score compared with students in the control group ($p = .029$, Cohen’s $d = 1.19$). The Irritability/Agitation/Crying subscale showed a small effect ($p = .05$, Cohen’s $d = 0.59$). Subscales of Lethargy/Social Withdrawal ($p = .087$, Cohen’s $d = 0.53$) and Hyperactivity/Noncompliance ($p = .074$, Cohen’s $d = 0.55$) approached significance but could not be classified as having a significant effect. The Stereotypic

Behavior and Inappropriate Speech subscales did not demonstrate a significant effect. The videotape analysis of off-task behaviors and teacher redirection did not show significant differences between the intervention and control groups; however, both groups showed improvements in classroom management after 16 weeks.

*Cohen's d : 0.41 practically significant effect; 1.15 moderate effect.

Was this study adequately powered (large enough to show a difference)? *Circle yes or no, and if no, explain.*

YES/NO The study was adequately powered based on correlation among sample size ($N = 49$), significance ($p < .05$), and effect size (Cohen's $d > 1.15$) values reported.

Were appropriate analytic methods used? *Circle yes or no, and if no, explain.*

YES/NO Both significance (p value) and effect (Cohen's d) values were reported for each subscale of ABC–Community.

Were statistics appropriately reported (in written or table format)? *Circle yes or no, and if no, explain.*

YES/NO All statistics were presented in a table format including demographic statistics, pretest/posttest rating comparison between control and intervention groups reported by teachers, and a pretest/posttest rating comparison of control and intervention groups reported by parents.

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

This study proved a reduction in maladaptive behaviors, including irritability, lethargy, social withdrawal, hyperactivity, and noncompliance among the GRTL intervention group compared to the control group. The GRTL yoga program is an evidence-based intervention that OTs can begin to bring to public-school classrooms nationwide.

This work is based on the evidence-based literature review completed by Carolyn Edwards, OTS, and Rochelle Mendonca, PhD, OTR/L, Faculty Advisor, University of the Sciences.

CAP Worksheet adapted from "Critical Review Form--Quantitative Studies." Copyright © 1998, by M. Law, D. Stewart, N. Pollack, L. Letts, J. Bosch, & M. Westmorland, McMaster University. Used with permission.

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