Adapting the PEERS® Intervention: A Comparative Analysis of Program Length

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Abstract

The present study compared the effectiveness of the 14-week Program for the Education and Enrichment of Relational Skills (PEERS®) for adolescents to an adapted 7-week version. Twenty-two adolescents with ASD and social skills deficits aged 12-17 years of age (M_{age} = 13.8, SD = 1.37) took part in either the 7-week, twice a week session program or the 14-week, once a week session program. Social skills were measured using the Social Skills Improvement System-Rating Scales (SSIS-RS). A repeated measures ANOVA revealed significant differences in intervention effectiveness between program lengths based on parent reports, with participants in the 14-week program performing better than those in the 7-week program. Univariate analyses revealed overall statistically significant improvements at post-test in social skills behaviours on the SSIS-RS for both groups. Results support that the PEERS® program as an intervention is better suited and produces stronger results in its original 14-week format, at least for the study participants.

Keywords: ASD; social skills; PEERS® intervention; adolescence

Autism spectrum disorder (ASD) is defined as a severe developmental disorder characterized by core deficits in language and communication, social functioning, and stereotypical or unusual behaviours and interests (Maye, Kiss & Carter, 2017). Prevalence rates suggest that 1 in 54 children in the U.S.A and 1 in 66 children in Canada are diagnosed with ASD, with more than four times higher rates among boys than among girls (The Centers for Disease Control and Prevention (CDC), 2020; Public Health Agency of Canada (National Autism Spectrum Disorder Surveillance System (NASS), 2018). Although there are common diagnostic features, there is also significant heterogeneity among individuals with ASD. For instance, 44% of children with ASD score in the average to above average range (score >85) on IQ measures, while 32% score at or below 70 (Christensen et al., 2016). Therefore, there is a growing concern regarding the availability and appropriateness of treatment interventions available for this diverse population. This heterogeneity is also apparent in how social challenges are expressed by individuals with ASD. For instance, some individuals with ASD seem disinterested in peers, while others actively, and often ineffectively, seek out social interaction (Davis & Carter, 2014). Much research has been invested in behavioral interventions used to address other core features of ASD (e.g., difficulties in expressive and receptive language and repetitive behaviours), which have achieved relatively successful outcomes. However, as children enter adolescence there is increased concern towards social disabilities as they become more prominent. These social disabilities are one of the least understood aspects of this disorder and often persist into adulthood (Flynn & Healy, 2012; Magiati, Tay, & Howlin, 2014; Tobin, Drager, & Richardson, 2014; Volkmar, Reichow, & McPartland, 2014).

Being able to navigate social environments, make friends, form romantic relationships, keep employment, and live independently are important components to having a positive quality of life for individuals with ASD. It is thus crucial that programs focus on helping individuals with ASD transition into adolescence. In order to do so, they must not only focus on general social skills (e.g., turn taking, initiating, responding), but also on social cognition, including but not limited to, perspective taking, interpreting nonverbal social cues, emotion regulation, recognition and understanding, and problem solving, and self-advocacy (Laugeson & Ellingsen, 2014; Wehmeyer & Shogren, 2017). However, research from the National Longitudinal Transition Study suggests that individuals with ASD often have little involvement in the transition process and future long-term goals (post-secondary education, vocation training, employment, and independent living; Wehmeyer & Shogren, 2017). This consequently demonstrates the need for programs that teach the skills necessary for social competence.

PEERS® Intervention

The PEERS® treatment manual is a parent-assisted intervention that focuses on adolescents between the ages of 12 – 17 years old. Social skills are taught to both parents and adolescents using psycho-educational and cognitive behavioural approaches and during each group meeting, adolescents are taught important social skills and are given the

opportunity to practice these skills in session during socialization activities (e.g., playing sports, board games, etc.). Parents are taught how to assist their teens in making and keeping friends by providing feedback through coaching during weekly socialization homework assignments.

The intervention we investigated includes 14 separate sessions for parents and adolescents that meet weekly for 90 minutes and focuses on teaching ecologically valid social skills (see Laugeson, 2014; Laugeson & Frankel, 2010 for specific program goals). Previous research has shown that adolescents who partake in the PEERS® significantly improved compared to delayed control groups on knowledge of social skills concepts, overall social skills, and had low attrition rates (Laugeson, 2014; Laugeson & Frankel, 2010; Laugeson et al. 2012). Additionally, individuals had diminished levels of anxiety, core autistic symptoms and problematic behaviours (Lordo et al., 2016; Schohl et al., 2014; Yoo et al., 2014).

The present study compared the effectiveness of the original 14-week UCLA PEERS® intervention (Laugeson, 2014) to an adapted 7-week version. Given that 14 weeks is often a significant amount of time for families to commit their limited time and resources, understanding how the PEERS® intervention may well be adapted would allow access to a greater number of families and different populations with a variety of needs. The authors of the present paper were first to describe the application of a 7-week version of PEERS to a group of adolescents with ASD and social skills deficits (Marchica & D'Amico, 2016). The findings suggested that the 7-week program was not as effective as published results examining the 14-week program and that adolescents with ASD may need more time to consolidate and practice the information and skills within the program (Marchica & D'Amico, 2016). It is thus hypothesized the 14-week intervention would demonstrate more significant gains than the 7-week program.

Methods

Participants

The study received ethical approval by the University's Office of Research. Recruitment was carried out through purposive sampling methods, using chain-referrals, advertisements and flyers. Separate consent forms were provided to both parents and adolescents prior to participating in the program, with adolescents providing assent for their participation and parents providing consent. Participants were not given any incentives for participation. At the end of the program adolescents received a surprise "graduation party" where cinema vouchers were provided to each participant.

Given the age of the participants in both groups of this study, they received their ASD diagnosis under the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition Text Revised (DSM-IV-TR). Within the DSM-IV, ASD was categorized under the diagnostic category of Pervasive Developmental Disorders, which represents a group of five related diagnoses including Autism, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), Rett's syndrome, Childhood Disintegrative Disorder and Asperger's Disorder (American Psychiatric Association, 2000). The DSM-5 has revised the definition of ASD into one single condition with different levels of severity and two core domains; 1) deficits in social communication and social interaction and 2) restricted repetitive behaviours, interests, and activities (RRBs) (American Psychiatric Association, 2013). Inclusion criteria for adolescent participants included: (a) between 12 and 17 years of age, (b) experiencing social difficulties as recognized by parents, (c) previously diagnosed with ASD by a qualified mental health professional, (d) no history of major mental illness (e.g., schizophrenia, bipolar disorder, or other types of psychotic disorders), and (e) no current problems with aggressive behaviours. Additionally, within the jurisdiction where the study was conducted (Quebec, Canada) an ADOS-2 administration is not necessary for an ASD diagnosis. Rather, the diagnosis is made based on a clinical evaluation that may or may not include assessment tools such as the WISC, ADOS, ADI, and most heavily include the clinician's clinical judgment.

Twenty-two adolescents with ASD and social skills deficits aged 12-17 years of age (M_{age} = 13.8 SD = 1.37) and their parents were separated into two groups for evaluation of the two variants of the PEERS® intervention (7-week and 14-week). Participants data from the 7-week group was used in a previous study (Marchica & D'Amico, 2016), while participant data for the 14-week group was collected for the purpose of this study's research question. Eleven participants (10 males, 1 female; M_{age} = 13.9, SD = 1.3) took part in the adapted 7-week, twice a week PEERS® (group A); while another 11 participants (6 males, 5 females; M_{age} = 12.7, SD = 1.4) took part in the original 14-week PEERS® (group B). The mean autism score on the parent form of the SSIS-RS at pre-test for group A was 17.1, while for group B it was 18.6. All participants continued to attend either their regular school programs or adapted programs in their neighborhood schools. There were no significant differences between groups based on sex, or autism score (F(1,20) = 4.00, p = .06; F(1,20) = 0.50, p = .50).

However, there was a significant difference between groups based on age ($F(1,20) = 7.64$, $p = .01$). Further analyses concluded that age was not a significant covariate, as such it was not included as a covariate.

Measures

Outcome measures included self-report and parent-report questionnaires examining social skills and problem behaviours.

Social Skills Improvement System-Rating Scales (SSIS-RS) (Gresham & Elliot, 2008). The SSIS-RS is a 76-item self-report and parent-report questionnaire, administered both at pre- and post-test to assess social skills deficits. There are three student versions based on age group, two of which were used in the current study (ages 8-12 years and 13-18 years). Psychometric properties were reported by Gresham and Elliot (2008) for parent questionnaires with coefficient alphas above .77, and test-retest reliability above .73. Items on the parent questionnaire provide frequency-based ratings from "never" to "almost always," and are written at a fifth-grade level to ensure readability. The student questionnaire uses a 4-point scale from "not true" to "very true," and is written at a second-grade level to ensure understanding and readability (Crosby, 2011). There are two scales on this questionnaire, Social Skills and Problem Behaviors, which were derived from a factor analysis. The Social Skills scale includes subscales of "communication, cooperation, assertion, responsibility, empathy, engagement, and self-control". The Problem Behavior scale includes subscales of "externalizing, internalizing, hyperactivity/inattention, autism spectrum, and bullying" (Crosby, 2011; Gresham & Elliot, 2008). Higher scores on the Social Skills scale indicate better social functioning and lower scores on the Problem Behavior scale indicate better behavioural functioning. In the current sample reliability coefficients ranged from good to excellent (student social skills $\alpha = .83$, problem behaviours $\alpha = .74$; parent social skills $\alpha = .70$, problem behaviours $\alpha = .78$).

Procedure

The PEERS® intervention was implemented as designed by using the "social skills for teenagers with developmental and autism spectrum disorders: PEERS® treatment manual" in order to avoid inconsistencies in implementation. The same PEERS® certified provider led the adolescent sessions (both for the 14-week and 7-week group), along with two graduate students who served as behavioural coaches. A PEERS® certified provider is someone who has been trained by UCLA trainers to be implement the PEERS® program. All sessions followed the PEERS® manual. The parent sessions were led by a trained graduate student (the same graduate student for both group formats) with previous experience working with parents. Again, these sessions followed the PEERS® manual and consisted of a review of the skills and principles being taught that week.

Data Analysis

Adolescents and parents completed the SSIS-RS forms at pre- and post-intervention to compare the effectiveness of the two PEERS® programs on social skills and problem behaviours. Multivariate test results of the SSIS-RS social skills and problem behaviours scales were analyzed according to the respondents (student self-report form and parent report form were analyzed separately) using repeated measures ANOVAs in order to compare effectiveness of the program between the two groups. Second, paired sampled t-tests were conducted to calculate differences in mean scores from pre- to post-test on specific subscales for both social skills and problem behaviour scales of the SSIS-RS. Statistical analyses were done using IBM SPSS (25) and interpreted at the 95% level of confidence.

Results

T-test analyses at baseline revealed no significant difference between social skills and problem behaviours scores between group A and B. Tests for assumptions revealed no outliers according to the outlier labelling rule (Hoaglin & Iglewicz, 1987), and normal distribution of data according to tests for skewness and kurtosis (data not shown). There was no attrition of participants in the study, but some data were missing on three items. The results of Little's MCAR test was non-significant ($p = 1$), suggesting that the missing data were missing completely at random and could be reliably predicted using the expectation-maximization algorithm. Table 1 presents the descriptive statistic of the SSIS-RS of the sample by group and report.

Table 1.
Descriptive Statistics of the SSIS-RS Pre-to Post-Test for Groups A and B

	Parent Pre-Test		*Parent Post-Test*		*Student Pre-Test*		*Student Post-Test*	
Group A	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Social Skills	86.36	12.45	89.00	11.59	89.73	16.51	92.64	22.62
Communication	13.45	2.02	14.73	2.57	13.09	2.70	13.27	3.41
Cooperation	12.00	2.45	11.82	2.64	15.36	3.91	15.18	4.12
Assertion	13.82	3.37	14.45	3.08	12.91	3.05	15.45	3.39
Responsibility	12.45	3.14	12.73	3.41	14.82	3.16	14.36	3.93
Empathy	12.36	4.11	12.64	2.87	13.09	3.51	12.36	4.20
Engagement	12.45	3.24	12.73	2.49	12.36	4.84	12.18	4.40
Self-Control	9.82	3.97	9.64	3.88	7.82	2.89	9.55	3.96
Problem Behaviours	29.91	15.12	27.18	12.30	21.55	10.87	19.18	9.38
Externalizing	10.18	7.11	8.91	6.22	7.91	5.11	8.09	5.05
Bullying	1.73	2.97	1.64	2.69	2.55	2.46	2.55	2.38
Hyperactivity/Inattention	9.09	4.66	8.09	4.44	7.09	3.10	6.09	3.08
Internalizing	8.64	4.8	8.18	2.44	8.36	5.28	6.64	3.59
Autism	17.09	4.44	15.00	3.52	--	--	--	--
	Parent Pre-Test		*Parent Post-Test*		*Student Pre-Test*		*Student Post Test*	
Group B	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Social Skills	67.73	9.96	80.50	11.73	82.45	13.58	94.18	111.94
Communication	10.80	2.49	12.50	2.67	12.73	2.28	13.45	2.38
Cooperation	10.20	2.61	12.90	2.77	14.45	3.39	15.81	3.43
Assertion	8.50	3.69	10.30	4.52	10.91	2.98	12.36	4.34
Responsibility	11.00	3.33	12.50	2.17	13.55	2.73	15.91	2.95
Empathy	9.30	2.41	11.60	3.20	11.36	2.29	12.64	3.04
Engagement	7.90	2.89	9.20	3.71	9.55	3.96	12.73	3.85
Self-Control	7.67	3.67	9.67	3.32	8.64	2.11	11.09	3.11
Problem Behaviours	31.82	7.40	29.50	10.69	19.45	10.32	15.50	12.47
Externalizing	9.30	4.08	8.20	5.09	6.67	4.30	6.67	5.66
Bullying	2.67	0.58	3.33	1.53	2.50	1.52	3.17	1.83
Hyperactivity/Inattention	9.50	2.32	8.00	2.71	6.80	2.04	5.60	3.66
Internalizing	12.10	6.03	11.40	4.03	8.70	5.06	8.20	6.61
Autism	18.40	4.27	17.00	6.67	--	--	--	--

First, we tested mean differences as a function of program implementation using separate 2 (group: A, B) x 2 (time: pre-test, post-test) repeated measures ANOVAs with social skills and problem behaviours as the outcomes. For the student reports of social skills, results yielded a significant main effect of time, $F(1, 20) = 5.13$, $p = .03$, $\eta_p^2 = .20$, such that post-test scores ($M = 93.41$, $SE = 3.86$) were greater than pre-test scores ($M = 86.09$, $SE = 3.22$). However, the group x time interaction was not significant, $F(1, 20) = 1.86$, $p = .19$, $\eta_p^2 = .08$. This means that the intervention did not significantly improve student-reported social skills (see Figure 1). Regarding student-reported problem behaviours, we did not find a significant main effect of time, $F(1, 19) = .98$, $p = .33$, $\eta_p^2 = .05$, or interaction, $F(1, 19) = .002$, $p = .96$, $\eta_p^2 = .00$. This suggests that our intervention did not reduce problem behaviours from the perspective of the students (see Figure 2).

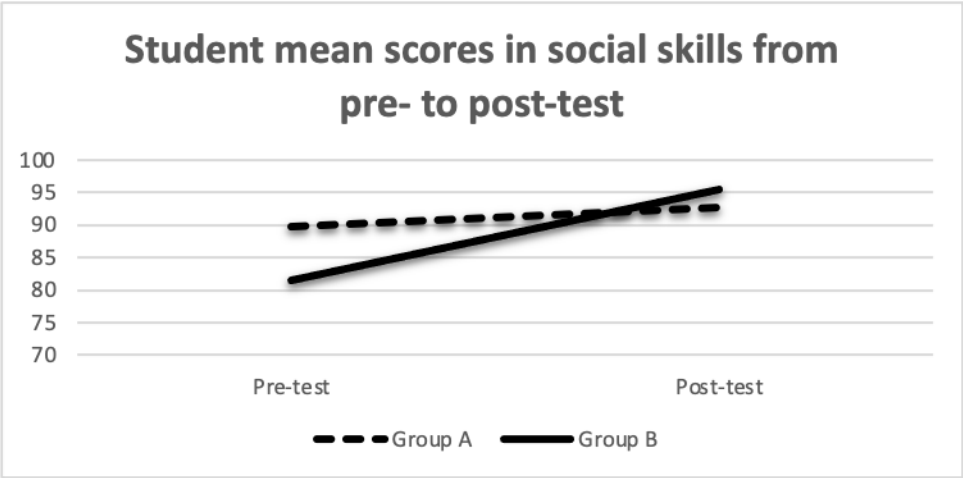

Figure 1. Student mean raw scores in social skills from pre- to post-test between groups A and B

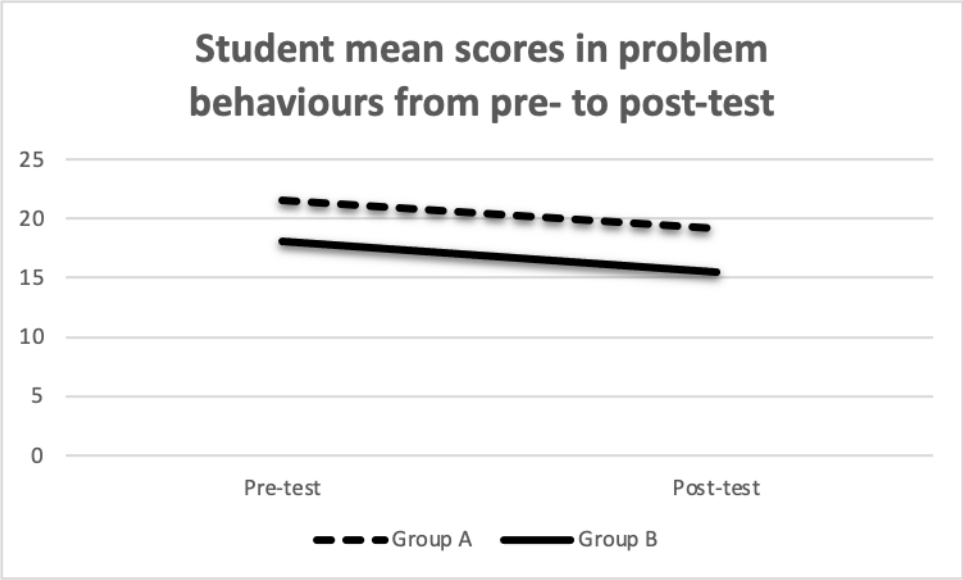

Figure 2. **Student mean raw scores in problem behaviours from pre- to post-test between groups A and B**

Next, we examined group differences in intervention results based on the parent reports. Again, 2 (group: A, B) x 2 (time: pre-test, post-test) repeated measures ANOVAs were run separately for reports on social skills and problem behaviours. Regarding social skills, there was a significant main effect of time, $F(1, 19) = 23.62$, $p < .001$, $\eta_p^2 = .55$, where post-test scores ($M = 84.75$, $SE = 2.55$) were greater than pre-test scores ($M = 76.68$, $SE = 2.50$), regardless of group. We also observed a significant difference between groups A and B, $F(1, 19) = 8.55$, $p = .01$, $\eta_p^2 = .31$, such that group A ($M = 87.68$, $SE = 3.29$) had higher parent-reported scores on social skills than group B ($M = 73.75$, $SE = 3.45$), regardless of time. However, there was also a significant group x time interaction, $F(1, 19) = 10.71$, $p = .004$, $\eta_p^2 = .36$. Here, pairwise comparisons showed that group A did not show significant change in social skills from pre-test to post-test, however group B saw significant improvements from the parents' perspectives (see Figure 3). This would mean that the 14-week intervention used by group B demonstrated greater improvements than the shorter version used by group A. Regarding parent-reported problem behaviours, results did not yield a main effect of time, $F(1, 19) = 1.87$, $p = .19$, $\eta_p^2 = .09$, nor a group x time interaction, $F(1, 19) = .13$, $p = .95$, $\eta_p^2 = .00$. Similar to the student reports, it appears that the intervention did not significantly reduce problem behaviours from the parent's perspective (see Figure 4).

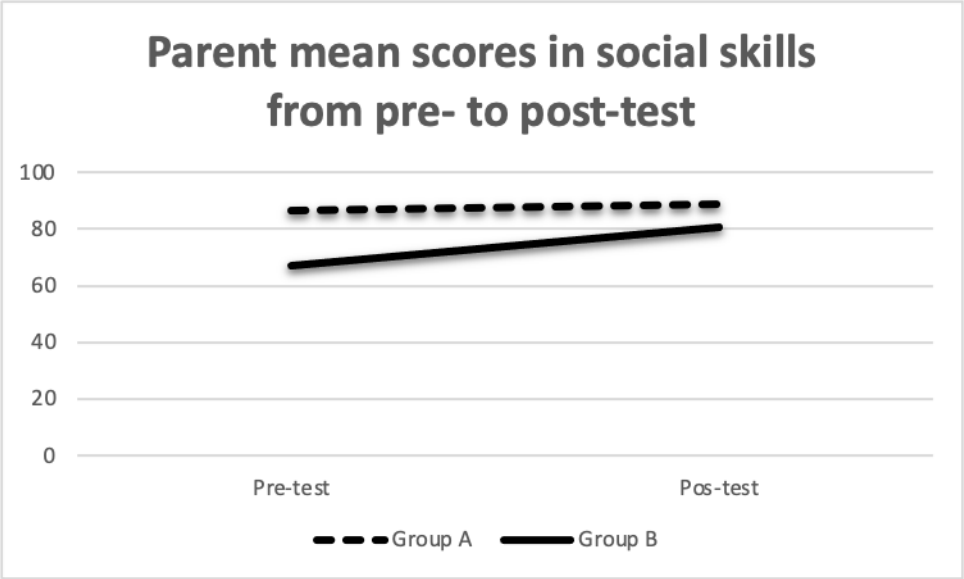

Figure 3. Parent mean raw scores in social skills from pre- to post-test between groups A and B

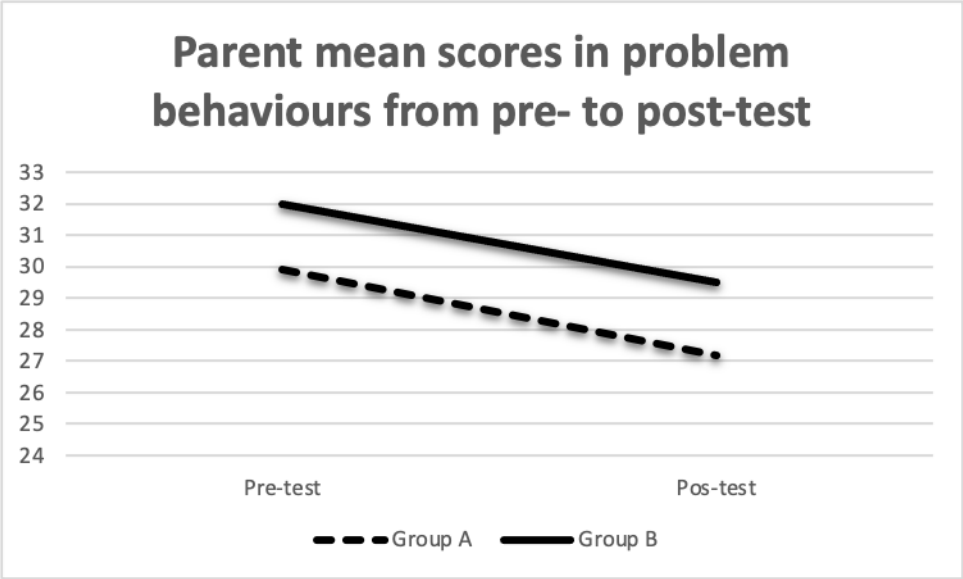

Figure 4. Parent mean raw scores in problem behaviours from pre- to post-test between groups A and B

Further, tests were conducted to examine the specific changes on the individual social skills and problem behaviours subscales. Paired sample t-tests were used to examine these changes for both group A and B. Parent reports for both the social skills and problem behaviours subscales revealed no statistically significant results for group A (see Table 2). Student reports revealed no statistical significance for the problem behaviours subscales in group A; however there was a statistically significant change in mean scores on the student reports for the assertion social skills subscale in group A ($t(10)= -3.22$, $p = .01$, $d = 0.97$) (see Table 3).

Table 2
Parent Mean Difference Subscale Scores From Pre- to Post-Test for Group A

Behaviors	*M*	*SD*	*T*	*df*	*p*	*D*
Social Skills						
Communication	-1.27	2.92	-0.21	10	.84	0.12
Cooperation	0.18	2.60	0.23	10	.82	-0.06
Assertion	-0.64	2.62	-3.22	10	.01*	0.07
Responsibility	-0.27	2.91	0.52	10	.62	-0.97
Empathy	-0.27	2.45	0.98	10	.35	0.15
Engagement	-0.27	2.48	0.24	10	.81	0.30
Self-Control	0.18	3.16	-1.81	10	.10	0.07
Problem Behaviours						
Externalizing	1.27	6.84	-0.09	10	.93	-0.03
Bullying	0.09	2.89	0.00	10	1	0.00
Hyperactivity/Inattention						
	1.00	3.82	0.87	10	.41	0.30
Internalizing	0.45	5.35	1.07	10	.31	0.32
Autism	2.09	4.18	1.66	10	.13	0.52

Note: M = mean; *SD* = standard deviation; *df* = degrees of freedom, *p ≤ .05, *d = Cohen's d.*

Table 3.
Student Mean Difference Subscale Scores From Pre- to Post-Test for Group A

Behaviours	*M*	*SD*	*T*	*df*	*p*	*D*
Social Skills						
Communication	-0.18	2.92	-0.21	10	.84	0.12
Cooperation	0.18	2.60	0.23	10	.82	-0.06
Assertion	-2.54	2.62	-3.22	10	.01*	0.07
Responsibility	0.45	2.91	0.52	10	.62	-0.97
Empathy	0.72	2.45	0.98	10	.35	0.15
Engagement	0.18	2.48	0.24	10	.81	0.30
Self-Control	-1.73	3.16	-1.81	10	.10	0.07
Problem Behaviours						
Externalizing	-0.18	6.84	-0.09	10	.93	-0.03
Bullying	0.00	2.89	0.00	10	1	0.00
Hyperactivity/Inattention						
	1.00	3.82	0.87	10	.41	0.30
Internalizing	1.73	5.35	1.07	10	.31	0.32

Note: M = mean; *SD* = standard deviation; *df* = degrees of freedom, *p ≤ .05, *d = Cohen's d.*

Parent post-test mean difference scores for group B revealed statistically significant improvements on the communication subscale (t(9)= -42.35, p = .05, *d* = 0.66*)*, cooperation subscale (t(9)= -4.39, p = .002, *d* = 1.00), assertion subscale (t(9)= -3.38, p = .01, *d*= .44), empathy subscale (t(9)= -2.30, p = .02, *d*= .81), and the engagement subscale (t(9)= -1.30, p = .01, *d*= .39). Results from the student report on social skills subscales revealed statistically significant results for the responsibility subscale (t(10) = -3.24, p = .01, *d* = .83), and the engagement subscale (t(10) = -3.18, p = .04, *d* = .81). There were no statistically significant results for student or parent reports for the problem behaviours subscales in group B (Tables 4 and 5).

Table 4.
Parent Mean Difference Subscale Scores From Pre- to Post-Test for Group B

Behaviours	*M*	*SD*	*T*	*df*	*p*	*d*
Social Skills						
Communication	-1.70	2.31	-2.35	9	.05*	0.66
Cooperation	-2.70	1.95	-4.39	9	.00**	1.00
Assertion	-1.80	1.69	-3.38	9	.01*	0.44
Responsibility	-1.50	2.46	-1.93	9	.09	0.53
Empathy	-2.30	2.54	-2.86	9	.02*	0.81
Engagement	-1.30	1.34	-3.07	9	.01*	0.39
Self-Control	-2.00	2.78	-2.16	9	.06	0.57
Problem Behaviours						
Externalizing	1.10	2.96	1.18	9	.27	-0.25
Bullying	-0.67	1.15	-1.00	9	.42	0.57
				9		
Hyperactivity/Inattention	1.50	3.50	1.35		.21	-0.59
Internalizing	0.70	5.10	0.43	9	.67	-0.14
Autism	1.40	3.66	1.21	9	.26	-0.25

Note: M = mean; *SD* = standard deviation; *df* = degrees of freedom, *p ≤ .05 **, p ≤ .001, *d = Cohen's d.*

Table 5.
Student Mean Difference Subscale Scores From Pre- to Post-Test for Group B

Behaviours	*M*	*SD*	*T*	*df*	*p*	*D*
Social Skills						
Communication	-0.73	1.79	-1.35	10	.21	0.31
Cooperation	-1.36	2.80	-1.61	10	.14	0.40
Assertion	-1.45	4.87	-0.99	10	.35	0.39
Responsibility	-2.36	2.42	-3.24	10	.01*	0.83
Empathy	-1.27	3.74	-1.13	10	.29	0.48
Engagement	-3.18	4.35	-2.43	10	.04*	0.81
Self-Control	-2.45	3.96	-2.06	10	.07	0.92
Problem Behaviours						
Externalizing	0.00	3.43	0.00	8	1	0.00
Bullying	-0.67	1.63	-1.00	5	.36	0.36
Hyperactivity/Inattention	1.20	2.74	1.39	9	.20	-0.41
Internalizing	0.59	3.40	0.46	9	.65	-0.09

Note: M = mean; *SD* = standard deviation; *df* = degrees of freedom, *p ≤ .05, *d = Cohen's d.*

Discussion

The purpose of the present study was to compare the effectiveness of the original once per week14-week (group B) UCLA PEERS® program format to an adapted 7-week, two times per week format (group A). Repeated measures ANOVAs comparing the two groups suggested that according to student reports there was no statistically significant difference in scores based on program length. However, based on parent reports, results revealed a significant difference in scores based on program length, with participants in the 14-week format demonstrating stronger improvements than those in the adapted 7-week format. This would suggest, in line with our hypothesis, that adolescents with ASD need longer to consolidate and practice the skills taught in a given session in order to achieve desired gains. Specifically, within the 14-week program format (group B), parent post-test results revealed significant improvements in social skills on the communication, cooperation, assertion, empathy, and engagement subscales with strong effect sizes. Student post-test results revealed significant improvements in social skills on the responsibility and engagement subscales, again with strong effect sizes, with some scores increasing by a full standard deviation. In contrast, in the 7-week program format (group A), only students reported significant improvements in post-test results on the assertion social skills subscale, with a small to medium effect size. There were no significant improvements in problem behaviours reported by parents or students in either group.

This is not uncommon as the goal of the program is to increase social skills among adolescents with ASD and does not necessarily focus on problem behaviours. Additionally, previous research has demonstrated that decreases in problem behaviours were predominantly seen at follow- up (Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012).

These results along with previous research conducted worldwide on the PEERS® program (Lordo et al., 2016; Schohl et al., 2014; Yoo et al., 2014) suggest that it continues to be an effective evidence-based social skills program for individuals with ASD. However, they also shed light on the importance of implementation method. Although, there were improvements in some self-reported social skills in the group in the adapted 7-week program, overall social skill improvements were not significant. While the group in the 14-week intervention demonstrated improvements in overall social skills on both parent and student reports. Additionally, group comparisons revealed that according to parent reports, the 14-week intervention had better improvements compared to the adapted 7-week intervention, specifically in social skills. As such, it would seem that in order for optimal gains to be achieved the original 14-week format should be followed.

Limitations

As with all research there are some limitations to the present study that should be noted. To begin, this study had a relatively small sample size for both groups A and B, which makes group comparison statistical analyses difficult to perform. Additionally, the samples included were heavily male populated (in total only 6 females participated in the study). Although, this is in line with prevalence rates being higher among males (1 in 42 vs. 1 in 189); it still limits the generalizability of results to larger, more diverse populations. Further, the sex distribution was not even within each group, with more females in group B. Although, females with ASD may have better social skills than males, our analyses revealed no significant differences in program effectiveness based on sex. Moreover, previous research on the PEERS® program also revealed no significant differences by sex in program results (McVey et al., 2017). Additionally, although the study did a comparison between different treatment modalities (7-week vs. 14-week), it is possible that gains were made simply as a treatment effect. That is, individuals demonstrate gains simply by being a part of some sort of intervention and not necessarily due to the type of intervention (i.e., some treatment is better than no treatment). Therefore, lack of control group may be considered another limitation. Lastly, using self-report and parent-rating scales as the primary outcome measures, given that both adolescents and parents were participants in the study, may have allowed for possible bias in their reports. Additional assessments from a third respondent, such as the child's teacher, or behavioural observations of the adolescent's social skills in naturalistic interactions would have been beneficial toward establishing further validity of the findings.

Future Directions and Conclusions

This study contributes to the growing research demonstrating that ecologically valid social skills can be taught to adolescents with ASD using psychoeducational and cognitive-behavioural treatment techniques. The results from this study suggest that the PEERS® program continues to be an effective social skills program for this population of individuals, but that in order to achieve maximum program results the fidelity of the 14-week format should be maintained. Additionally, given that parental implication is an important component of the PEERS® program, the results continue to demonstrate the importance of parent participation in intervention and as coaches that help to generalize skills.

When parents are aware and informed on skills needed for their children to succeed socially, they become more confident social coaches. Thereby, increasing the likelihood of generalizability of learned skills at home, school and in the community.

A future direction of the current study would be to include continued follow-up assessments of learned skills and friendship development, especially as these adolescents enter the next significant transitions in their lives (e.g., entering emerging adulthood). These long-term assessments would also yield useful information on the durability of findings.

The present study compared the original 14-week PEERS® program to a modified 7-week version, and greatly adds to the emergent literature regarding social skills interventions for adolescents with ASD and/or social skills deficits. This study provides an independent replication of the PEERS®, and thus augments knowledge on the replicability and effectiveness of this program. The current study found mixed results in that although gains in social skills were made within both program formats, there was a significant difference in effectiveness with participants in the 14-week program attaining greater improvements in socials skills than individuals in the 7-week program. As such, results suggest that the PEERS® is best suited as a 14-week intervention rather than a condensed 7-week intervention. What remains vital, is the fact that social policies should be in place to promote social skills programs for adolescents with autism. This is crucial if we want to ensure and provide a better quality of life for these individuals.

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