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Social Competence in Childhood Brain Tumor Survivors: Feasibility and Preliminary Outcomes of a Peer-Mediated Intervention

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Abstract

Objective—Evaluate the acceptability, feasibility, and preliminary outcomes of a peer-mediated intervention to improve social competence of brain tumor survivors and classmates.

Methods—Twelve childhood brain tumor survivors and 217 classroom peers in intervention (n = 8) or comparison (n = 4) classrooms completed measures of social acceptance and reputation at two time points in the year. The intervention (5–8 sessions over 4–6 weeks) taught peer leaders skills for engaging classmates. Individual and classroom outcomes were analyzed with ANCOVA.

Results—Recruitment rates of families of brain tumor survivors (81%) and schools (100%) were adequate. Peer leaders reported satisfaction with the intervention. Preliminary outcome data trended toward some benefit in increasing the number of friend nominations for survivors of brain tumors but no changes in other peer-reported metrics. Preliminary results also suggested some positive effects on classroom levels of victimization and rejection.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Conclusions—A peer-mediated intervention was acceptable to families of brain tumor survivors and feasible to implement in schools. Findings warrant a larger trial to evaluate improvements for children with brain tumors and their peers.

Keywords

social competence; brain tumor survivors; peer-mediated; childhood cancer; pediatric oncology

Background

The majority of children diagnosed with brain tumors will become long-term survivors.¹ Unfortunately, children with brain tumors often report social strains associated with disruptions and daily hassles (i.e., activity limitations, fatigue, missing school, learning problems, teasing).^{2–4} Teachers, parents, and peers describe brain tumor survivors as a group as having deficits in social competence and problems making friends compared with peers and normative data.^{3,5–9} Evidence also suggests that survivors may underestimate peer relationship difficulties compared with healthy children.⁸

Development of social competence is a critical element of normal child development.¹⁰ Following the work of Parker and Asher,¹¹ Cavell,¹² and Yeates et al.,¹³ we focused on two fundamental components of social competence with peers: social reputation (what is a child like?) and social acceptance (is the child liked?). Peer reports of social competence tend to be stable and predict whether the child is likely to be bullied, drop out of school, experience depressive symptoms, or show delinquent behavior.^{11,14} Data from peers also predict children's interpersonal functioning and economic success in adulthood.^{15–17} Given that peer reports of children's social competence are stable and strong predictors of later outcomes in multiple domains, and correlations between data from parents, teachers, or self-reports and data from peers are low,^{18,19} peer report is especially important as a measure of social competence.

Two broad categories of intervention have been used to improve a child's social reputation and acceptance among peers: direct skills training and peer-mediated training. Direct training involves teaching the affected child specific social skills either individually or in groups. While direct training improves a child's social skills from the perspective of parents and teachers, the effects on peers' attitudes about the child (social reputation) and peer-reported friendships (social acceptance) are weak.^{20,21} To date, four pilot intervention studies have used direct skills training with children surviving brain tumors.^{22–25} All studies showed some improvements in social competence, but results were inconsistent across reporters (i.e., child, parent, or teacher) and studies. One study demonstrated improvements in observed social performance within intervention group interactions but not in social problem-solving skills.²⁶ Unfortunately, no study included peer reports and all had moderate recruitment rates (i.e., 42–65%), suggesting that these types of strategies are not easily implemented.

In peer-mediated training, peers are taught how to engage children who may seem “different” and are isolated. This approach improves inclusion by changing the attitudes of peers who then serve as role models to classmates. Although the need to recruit and train

peers to coach other children could make peer-mediated intervention more challenging to implement than direct skills training, peer-mediated intervention has been effective for children with special needs,²⁷ notably children with autism spectrum disorders (ASD).²⁸ Children with ASD clearly differ from children with brain tumors, who may have been well liked and socially skilled prior to their treatment, but display social difficulties afterwards due to disease- or treatment-related late effects. However, both groups of children are viewed as being isolated, victimized, and not well liked by classmates.^{7,28} Given this commonality, peer-mediated training holds promise for improving the social competence of brain tumor survivors.

This pilot trial evaluated whether a peer-mediated intervention initially developed for children with ASD and adapted for childhood brain tumor survivors was acceptable to families and feasible to implement in schools. Acceptability was evaluated through recruitment and retention of brain tumor survivors. Feasibility was evaluated by examining the percent of schools agreeing to the project, timeline for completion of the intervention, and acceptability to peer leader participants. Preliminary social competence outcomes were explored for evidence of potential benefits or harm from the intervention. Exploratory hypotheses were that children with brain tumors in intervention classrooms would have more friendships, greater social acceptance, lower social rejection, and lower victimization than children with brain tumors in comparison schools. We evaluated any potential benefit or harm for peer leaders participating in the intervention, recognizing that some interventions which have been routinely used in schools such as DARE and virginity pledges have had adverse effects (e.g., increased substance use, reduced safe sex practices).^{29–31}

Method

Participant Eligibility

Eligibility for brain tumor survivors included: (a) current age 6–14 years (1st–8th grade); (b) no evidence of active disease; (c) at least 3 months beyond completion of therapy (with no upper limit); and (d) in a regular classroom at least part of the day. The study was conducted at a single, medium-sized cancer center, which treats approximately 25 new brain tumor patients per year (including benign tumors). Because previous work in classrooms had suggested large effect sizes related to peer reports of victimization and low social acceptance for brain tumor survivors,^{7,9} and previous work had demonstrated low correlations between parent, teacher, or child, and peer reports,¹⁸ we chose not to base eligibility on parent, teacher, or child report of social problems. Based on two previous studies, we expected to enroll survivors with a range of social functioning who, as a group, had significant social problems.

Recruitment Procedures and Study Design

Institutional Review Board approval was obtained prior to all study procedures. Potentially eligible patients were identified by querying a database maintained by the cancer center. Parents of these patients were contacted via letter and phone to explain the study and determine eligibility. Home visits were scheduled to obtain parental consent, a brief medical history (i.e., date of diagnosis, date of treatment completion, types of treatment received,

presence of any vision, hearing, motor, endocrine, speech, seizure, or other late effects, and presence of individualized education plan [IEP] or other school services), and permission to contact the school. Next, school district superintendents and/or principals were contacted to explain the study and obtain permission to contact the child's teacher and to conduct the study in the child's classroom. Then, the child's classroom teacher was contacted via phone or email and a school meeting was scheduled to explain the study, obtain teacher consent, schedule the classroom study visit, and provide the teacher with permission forms for children to bring home to their parents. The principal and teacher were informed of our interest in examining the social functioning of the brain tumor survivor, but, to protect the privacy of the survivor, classroom children and parents were informed only of our interest in studying friendships. All children, including the brain tumor survivor, had to return the parental permission form to participate. Since the intervention required twice-weekly visits to the school, schools within a 90-minute drive were assigned to the intervention group and those greater than 90 minutes away were assigned to the comparison group. Participants were assessed at entry into the study (Time 1) and at the end of the school year (Time 2).

Classroom Participants and Procedures

In the 13 classrooms, 232 of 269 parents (86.2%) gave permission for their child to participate. Of the 232 children with parental permission, 219 (94%) gave assent to participate at Time 1. Only one child declined; the remaining 12 children (5%) were absent on the assessment day. At Time 2, 206 children (88.8% of those with parental permission) participated; 11 children (5%) were absent or had moved, and 14 children (6%) did not have a Time 2 assessment because of late school enrollment. In total, 230 children (99% of those with parental permission) participated at either Time 1 or Time 2 and 195 children (84.1%) completed both assessments.

All students who returned a parental permission form and provided assent used net book computers with privacy screens to complete the questionnaires. Following the Time 1 assessment, peer leaders were chosen based on peer nominations on two items ("a person with good ideas for things to do" and "a person everyone likes to be with"). The three children of the same sex as the survivor who received the most nominations from classmates on these items were asked to serve as peer leaders. If the child surviving a brain tumor was one of the top three children in the class, the child with the next most nominations was asked instead. Surprisingly, this occurred in three intervention classrooms and two comparison classrooms. Prior to asking the nominated students to serve as peer leaders, we confirmed our selections with the teacher to ensure there were no external reasons to exclude a child. Research staff then called parents of peer leaders to obtain verbal permission for their child to participate in the intervention.

Measures

Peer Acceptance

Friendships.³² An unlimited choice sociometric measure was used to measure how much each child was accepted by peers. Children were asked to indicate which of their classmates they perceived to be their best friend, second best friend, and third best friend, and then to identify any other friends in their class. Choices were made separately for same-

and other-sex peers. Combining same-sex and other-sex friendships created an overall friendship index. This procedure is known to produce reliable measures of acceptance among peers.³²

Like Ratings: Children were asked to rate each classmate on a five-point scale from *1 = someone you do not like* to *5 = someone you like a lot*.³³ This scale yields two scores: Acceptance (i.e., the number of “5” nominations a child receives) and Rejection (i.e., the number of “1” nominations the child receives). This approach reliably measures peer acceptance.³⁴

Social reputation with peers

Peer Assessment Procedure: A peer assessment procedure³⁴ was used to measure children’s social behavior (e.g., leadership, victimization). Participants were asked to indicate which of their classroom peers best fit each of a set of forms of social behavior or individual functioning (e.g., someone who is a good leader). Children were able to nominate as many children as they liked for each role, but were restricted to nominating only boys or only girls based on the gender of the child surviving a brain tumor in their class (children were told that we were only interested in boys or girls in their classroom). Items were adapted from the Revised Class Play.³⁵ Peer assessment measures are flexible and allow for measurement of specific aspects of social behavior.³⁴ In this study the peer assessment procedure was used to create measures of victimization, leadership, ineffectiveness, popularity, justice, care, politeness, sensitivity, gregarious, and trust. Our primary interest was victimization and popularity. Items used as indicators of victimization were “someone who gets teased by other children,” “someone who is often picked on,” and “someone other kids push around.” These items demonstrated acceptable internal reliability ($\alpha = .92$ at Time 1, $\alpha = .96$ at Time 2). Popularity was measured with two items, specifically “a person everyone likes to be with” and “someone who has many friends.” These items were observed to be reliable at Time 1 and Time 2 ($\alpha = .91$ and $.90$). The measure of popularity was used to assess the effect of the intervention on peer leaders.

Peer Leader Qualitative Feedback on the Program—During the last program session, peer leaders provided oral feedback on the program, including what they learned, what was positive about the sessions, and what they did not like or would change about sessions; the interventionists took detailed notes. The interventionists also provided their feedback and comments regarding the acceptability of the intervention.

Peer Leader Intervention—The Peer Intervention Manual²⁸ was modified in small but critical ways to better fit clinical observations and previous peer data about the social competence of brain tumor survivors. In contrast to children with ASD, survivors of brain tumors are rarely viewed as aggressive or behaviorally inappropriate. They are, however, seen as sensitive, excluded, left out, and victimized.^{7,8} Examples in the revised manual highlighted children who might be “different” or excluded as a result of fatigue, missing school, poor coordination, or physical appearance. We modified the number of small group sessions with 2–3 peer leaders from twelve 20-minute sessions occurring twice weekly to between five and eight 30–40 minute sessions occurring twice weekly. We allowed for some

variability in the number and length of sessions to accommodate school schedules. We found fewer but longer sessions fit better with school schedules and were more acceptable to teachers (sessions typically occurred during lunch).

The peer intervention was designed to encourage peer leaders to include children who are isolated and not socially connected. The brain tumor survivor was never identified; peer leaders were encouraged to accept differences among classmates and promote inclusion of all children. The theme was how to include kids who are different or not fitting in with others. Topics included: noticing and tolerating differences; strategies to include others (reaching out, modeling, reinforcement); noticing others who are not being included; initiating and responding to interactions with potential new friends; including others in games/social situations; sustaining engagement; and resolving conflict. While we changed the examples to reflect common problems experienced by isolated and victimized children, the primary topics (i.e., tolerating differences, strategies for inclusion) were unchanged from the work of Kasari et al.²⁸ The sessions were adapted to fit the developmental stage of participating children by changing the language used and examples discussed with peer leaders (e.g., first graders discussed interactions within the context of games while eighth graders discussed conversational interactions in hallways or on the bus). Peer leaders were asked to complete “homework” after each session, applying their new peer inclusion skills to their daily lives. Homework assignments were reviewed at the beginning of the next session.

Two retired classroom teachers served as interventionists, selected for their strong classroom experience. They assisted in the adaptation of the manual and were trained to conduct the intervention in a one-day workshop. Treatment fidelity was ensured through written session notes and weekly supervision by the site PI (XX) and study PI (YYY).

Data Analyses

Feasibility was evaluated using recruitment and retention rates of children with brain tumors (acceptability to families), recruitment rates of schools, acceptability of the intervention to peer leader participants (including qualitative comments about potential benefit and harm to peer leaders), and the ability to complete the project within one school year. Two sets of analyses were conducted to evaluate preliminary social competence outcomes. We compared (a) brain tumor survivors in intervention vs. comparison classrooms; and (b) classroom-level characteristics in intervention vs. comparison classrooms. Classroom-level characteristics were calculated by averaging the outcome across all members of a classroom. For each set of analyses, analyses of covariance (ANCOVAs), adjusting for Time 1 scores of the outcome, were conducted with emphasis on the four areas of hypothesized changes: (a) friend nominations, (b) social acceptance, (c) social rejection, and (d) victimization. Potential benefit and harm to peer leaders was assessed qualitatively based on oral feedback from peer leaders and quantitatively using dependent t-tests comparing peer leaders' friend nominations and popularity before and after the intervention. Given non-random assignment, we compared intervention and comparison schools on class size, geographic location (small city, suburb, rural), and percentage of children eligible for free/reduced lunch (a proxy for SES).³⁶ There were no statistically significant differences between intervention and comparison schools on these factors and therefore we did not include them in further

analyses. All peer-reported outcomes were adjusted for the number of same-sex and opposite-sex nominators in the class using a regression-based procedure that accounts for variation in group size.³⁷ This procedure maintains the original metric of the scores and has advantages over other techniques such as converting data to Z-scores or proportion scores.³⁷

Results

Acceptability to Families

Recruitment and retention of survivors—Parents of 20 brain tumor survivors were contacted. Four children were ineligible (one attended home school, one moved out of state, and two reported ongoing medical issues). Of the remaining 16 parents, 13 consented (81%) and three declined (reasons included “too many transitions happening in family’s life,” the child was not interested, and passive decline). No child with a brain tumor dropped out of the study. Table 1 shows demographic characteristics of brain tumor survivors and classroom children.

Feasible in the Schools

Recruitment of schools and peer leaders—Each brain tumor survivor attended a different school in a different school district. All districts and schools agreed to participate (100%). Eight schools/classrooms were assigned to the intervention and five to the comparison condition (Figure 1). Because one school agreed to participate late in the spring (principal on family leave), we only conducted the Time 1 assessment in that school. For the peer leader intervention, 100% of parents of selected leaders and 100% of peer leaders provided permission and assent. Twenty-three peer leaders in eight classrooms participated (three per classroom in seven classes and two in the smaller eighth class).

Timeline to complete the project—Twelve of the 13 classrooms recruited completed a Time 1 and Time 2 assessment. Average time between assessments was 3.9 months (SD = 0.7). The interventionists completed the manualized intervention at each intervention school; intervention averaged 7 sessions (range 5–8) over 4–6 weeks. All content was covered in each group but some schools preferred scheduling longer but fewer sessions and we accommodated this preference.

Acceptability of peer leader intervention—On average, peer leaders attended 94% of sessions. Peer leaders provided qualitative feedback, reporting high satisfaction. Several peer leaders asked our interventionists if they could repeat the program for other children in the classroom; as one eighth-grade boy remarked, “*It is important for other kids to get the chance to do this.*” When asked about what they learned, peer leaders stated:

“I’m more aware of the power of leaders, helping others and doing the right thing.”
(8th grader)

“I learned what I should look for in a friend... what I’m doing to be a good friend - to be a better friend.” (8th grader)

“People are the same as you with the same feelings. I hope to see someone else get noticed who normally doesn’t.” (6th grader)

"I used to look at a person alone and say, 'That's so sad,' now I go up to them and ask them to play." (4th grader)

"I learned how to get other kids involved with your friends so they're not left out." (4th grader)

"I try to be more patient with kids who have problems." (1st grader)

Interventionists took detailed notes about the children's reactions to the material. They generally reported openness to the material but noted that the youngest children (1st graders) tended to have fewer experiences to draw from and had had difficulty generalizing skills beyond a specific situation.

Preliminary Outcomes

Social competence of brain tumor survivors—Contrary to our expectations, five of 13 brain tumor survivors were nominated by peers as leaders using the questions, "a person with good ideas for things to do" and "a person everyone likes to be with" (three in intervention classrooms and two in comparison classrooms). These survivors (two male, three female) were diagnosed with astrocytoma ($n = 1$), ependymoma ($n = 2$), and germimoma ($n = 2$). Two received surgery and radiation, one received surgery and chemotherapy, one received radiation and chemotherapy, and one received surgery, radiation, and chemotherapy. On average, they completed treatment 1.98 years prior to the study. Parents reported late effects of vision problems ($n = 2$), motor problems ($n = 2$), and hair loss ($n = 1$). There were no statistically significant differences between brain tumor survivors who were chosen as leaders and those who were not on demographic or medical variables with one exception: leaders tended to have a shorter time since diagnosis compared with non-leaders, $t(10) = 4.11$, $p = .002$.

On average, there were no significant differences in social competence outcomes at Time 1 between brain tumor survivors and classroom peers. Brain tumor survivors in comparison classrooms showed higher levels of victimization than survivors in intervention classrooms at Time 1 ($p < .05$), but no differences on other outcomes. Examination of potential intervention effects showed no significant differences in outcomes between brain tumor survivors in intervention classrooms versus comparison classrooms (Table 2). Although not statistically significant, brain tumor survivors in intervention classrooms had on average about two more friendship nominations at Time 2 than those in comparison classrooms, $F(1, 9) = 1.19$, $p = 0.30$, $r = .33$. However, there were no differences in social acceptance, $F(1, 9) = 0.19$, $p = 0.67$, $r = .14$, social rejection, $F(1, 9) = 0.44$, $p = 0.52$, $r = .20$, or victimization, $F(1, 9) = 0.17$, $p = 0.69$, $r = .13$ between the groups.

Classroom-level outcomes—Two outcomes showed statistically significant differences between intervention and comparison classrooms (Table 2). Intervention classrooms demonstrated lower levels of social rejection, $F(1, 9) = 7.85$, $p = 0.02$, $r = .66$, and victimization, $F(1, 9) = 5.60$, $p = 0.04$, $r = .60$, than comparison classrooms at Time 2. There were no differences in friend nominations, $F(1, 9) = 0.26$, $p = 0.62$, $r = .16$, or social acceptance, $F(1, 9) = 0.02$, $p = 0.88$, $r = .05$.

Potential benefit or harm—As noted in the qualitative feedback, peer leaders reported some benefit in their approach to friendships. Friend nominations for peer leaders increased by 1.12 from Time 1 to Time 2, $t(22) = 2.43$, $p = .02$, 95% CI (0.16, 2.09). The popularity of peer leaders did not change significantly, mean difference = 1.22, $t(22) = 0.90$, $p = .38$, 95% CI (−1.59, 4.04), suggesting that participation in the intervention did not harm their positive social status. None of the peer leaders reported adverse effects during the qualitative feedback sessions.

Discussion

A peer-mediated intervention aimed at improving social competence of brain tumor survivors within a classroom was acceptable to children with brain tumors and their families, and was feasible to implement in schools. We enrolled a larger percentage of eligible brain tumor survivors compared with previous work using direct training.^{22–25} Schools were open to the intervention. Participation rates were high among classmates and peer leaders. The retention rate was also high; no brain tumor survivors or peer leaders dropped out of the study and almost 85% of classroom peers participated at both time points (with lack of participation largely due to absence or moving out of the school). In addition, 12 of 13 classrooms completed both assessments. Peer leaders expressed satisfaction with the program and some even suggested benefits of participating. Exploratory analyses of intervention effects showed that although not statistically significant, brain tumor survivors in the intervention group had more friend nominations than those in the comparison group. Contrary to our expectations, the intervention group did not show significant changes in social acceptance, rejection, or victimization. At the classroom level, the intervention seemed to have positive effects on the level of victimization and rejection but did not significantly affect the number of friend nominations or social acceptance for children. Importantly, there did not seem to be adverse effects of the intervention on peer leaders, as they retained high social status at both assessment points. These data demonstrated feasibility and acceptability of the intervention and support attempting a larger, randomized trial of this intervention to evaluate efficacy.

Two important contributions of this work were the focus on training peers (rather than the affected child) and the reliance on peer ratings. Our intervention encouraged peer leaders to include children who were isolated and perceived as “different.” Although we expected to see gains in victimization and social rejection for brain tumor survivors, the intervention lacked clear content in these areas. The focus was not on stopping other children from teasing or picking on isolated children, but rather on modeling appropriate ways to include, sustain interactions, and befriend such children. Thus, additional modules that focus on reducing victimization and rejection may be needed to obtain individual-level improvements in these areas. Future studies should also include longer follow-up periods to determine if isolation and victimization can be attenuated by an increase in positive friendships.³⁸

Although extending the literature on improving social competence in brain tumor survivors, this study had several limitations. First, our sample was small, and we were underpowered to evaluate efficacy and unable to examine whether any child characteristics (e.g., current age, time since diagnosis, age at diagnosis, number of late effects) modified the effects of the

intervention on social status outcomes. Although not statistically significant, brain tumor survivors in the comparison group seemed to have more late health effects than those in the intervention group, possibly biasing our results in favor of the intervention group. Future studies should evaluate medical characteristics and cognitive status of brain tumor survivors as potential modifiers. Additionally, the representation of brain tumor diagnoses in our small sample, while representative of our medium-sized cancer center, does not include all brain tumor diagnoses (such as medulloblastoma), and a large multi-center trial will be needed to gain a fully representative sample of pediatric brain tumors. Second, we did not screen to exclude survivors without social problems. Since five of the 13 survivors were nominated as leaders, there may have been a ceiling effect. There is a need for a screening test that corresponds with peer nominations to identify children in clear need of help with peer relationships. Additionally, given limited resources to conduct this pilot study, we did not randomly assign schools to the intervention. Although we adjusted for classroom size in analyzes, we were not adequately powered to test whether any school characteristics could be moderating variables. Future work should examine whether school characteristics influence the effectiveness of the intervention. Future work should also consider incorporating observational data to confirm peer leaders are carrying out the skills taught and as an additional source of information about the social functioning of brain tumor survivors.

Clinically, our results suggest that a peer-mediated intervention to improve the social competence of children surviving brain tumors warrants further consideration. Providers working with brain tumor survivors who struggle with peer relationships may want to consider referring families to programs involving peer-mediated social skills training as an alternative to one-on-one or group social skills training of affected children.

In conclusion, a peer-mediated intervention was acceptable to families and feasible in public schools. Although the study focused on obtaining preliminary experience with the intervention rather than testing efficacy, results suggested a trend for increased friend nominations for brain tumor survivors as well as positive effects for classroom levels of victimization and rejection, warranting further study in a larger randomized trial of survivors. If this intervention is found to be efficacious, efforts for dissemination may focus on training school personnel to conduct the intervention.

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Figure 1.
Consort flow diagram of study enrollment.

Table 1

Characteristics of brain tumor survivors and classroom children.

Characteristic	Brain Tumor Survivors		Classroom Children	
	Intervention (<i>n</i> = 8)	Comparison (<i>n</i> = 4)	Intervention (<i>n</i> = 136)	Comparison (<i>n</i> = 81)
	<i>M</i> (<i>SD</i>) or <i>n</i> (%)	<i>M</i> (<i>SD</i>) or <i>n</i> (%)	<i>M</i> (<i>SD</i>) or <i>n</i> (%)	<i>M</i> (<i>SD</i>) or <i>n</i> (%)
Age (years)	10.5 (2.6)	9.8 (2.3)	10.2 (2.6)	9.9 (2.0)
Range	6.9–14.0	7.0–12.3	6.2–14.9	6.4–13.9
Sex				
Male	5 (62.5%)	2 (50.0%)	66 (48.5%)	41 (50.6%)
Female	3 (37.5%)	2 (50.0%)	70 (51.5%)	40 (49.4%)
Race				
White	7 (87.5%)	4 (100%)	127(93.4%)	68 (84.0%)
African American	1 (12.5%)		4 (2.9%)	7 (8.6%)
Other	---		3 (2.2%)	4 (4.9%)
Missing	---		2 (1.5%)	2 (2.5%)
Diagnosis				
Astrocytoma	3 (37.5%)	3 (75.0%)	N/A	N/A
Germimoma	3 (37.5%)	0 (0.0%)		
Ependymoma	1 (12.5%)	0 (0.0%)		
Craniopharyngioma	1 (12.5%)	1 (25.0%)		
Time Since Diagnosis (yrs)	4.5 (2.7)	5.2 (1.9)	N/A	N/A
Range	2.0–8.4	2.6–7.1		
Time Since Tx Ended (yrs)	2.8 (2.2)	4.1 (1.4)	N/A	N/A
Range	0.6–6.8	2.1–5.3		
Treatment Received				
Surgery	6 (75.0%)	4 (100%)	N/A	N/A
Radiation	7 (87.5%)	1 (25.0%)		
Chemotherapy	5 (62.5%)	3 (75.0%)		
Late Effects (parent-reported)				
Vision	1 (12.5%)	3 (75.0%)	N/A	N/A
Motor	3 (37.5%)	3 (75.0%)		
Endocrine	1 (12.5%)	3 (75.0%)		
Seizures	2 (25.0%)	1 (25.0%)		

Note. One child surviving a brain tumor assigned to the comparison condition was excluded from analyses because we were only able to conduct a Time 1 assessment. Characteristics of classroom children are for those who participated at Time 1 and/or Time 2. School grades ranged from 1 to 8. There were no significant differences between intervention and comparison children on any demographic variable. There were no statistically significant differences on any medical or demographic variable between brain tumor survivors in intervention or comparison groups.

Table 2

Adjusted Time 2 group means and exploratory ANCOVA results comparing the intervention with comparison at the individual level for brain tumor survivors and at the classroom level.

	Individual Level				Classroom Level			
	Social Competence Domain	Intervention <i>M</i> (SE)	Comp <i>M</i> (SE)	Difference [95% CI]	Intervention <i>M</i> (SE)	Comp <i>M</i> (SE)	Difference [95% CI]	
Friend Nominations		8.47 (.84)	6.85 (1.20)	1.62 [-1.75, 4.99]	8.82 (.38)	8.48 (.54)	0.34 [-1.16, 1.84]	
Acceptance		4.17 (.79)	3.56 (1.12)	0.61 [-2.52, 3.74]	4.27 (.29)	4.19 (.42)	0.08 [-1.10, 1.26]	
Rejection		2.40 (.60)	3.11 (.86)	-0.71 [-3.13, 1.71]	1.81 (.16)	2.58 (.22)	-0.77* [-1.38, -0.15]	
Victimization		10.32 (1.13)	9.32 (1.80)	1.00 [-4.46, 6.47]	6.94 (.42)	8.74 (.61)	-1.80* [-3.51, -0.08]	

Note. Comp = comparison group. The table shows T2 group means adjusted for the T1 covariate and the estimated differences between groups (intervention vs. comparison) with the T1 covariate included in the model for children surviving brain tumors (individual level) and classrooms as a whole (classroom level). Intervention $n = 8$; Comparison $n = 4$

* $p < .05$