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Problem-Solving Intervention for Caregivers of Children with Mental Health Problems

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Abstract

Building Our Solutions and Connections (BOSC) focused on enhancing problem-solving skills (PSS) of primary caregivers of children with mental health problems. Aims were determining feasibility, acceptability, and effect size (*ES*) estimates for depression, burden, personal control, and PSS.

Methods—Caregivers were randomized to BOSC (n=30) or wait-list control (WLC) groups (n=31). Data were collected at baseline, post-intervention, and 3 and 6 months post-intervention.

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Results—Three-months post-intervention, *ES* for burden and personal control were .07 and .08, respectively. *ES* for depressed caregivers for burden and personal control were 0.14 and 0.19, respectively.

Conclusions—Evidence indicates that the intervention had desired effects.

Keywords

Primary Caregivers; Problem Solving Intervention

A large number of children are treated for mental health problems. In a recent national survey of mental health services for adolescents in the past year, 12.5% were treated at a mental health facility, 11.5% at an educational facility, and 2.8% at a medical setting (Substance Abuse and Mental Health Services Administration, 2009). Primary caregivers of these children have higher levels of burden and/or depressive symptoms than caregivers of children without such problems (Duchovic, Gerkenmeyer, & Wu, 2009; Elgar, Curtis, McGrath, Waschbusch, & Stewart, 2003; Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004; Gerkenmeyer, Perkins, Scott & Wu, 2008). Contributing factors to caregivers' depression and burden are inadequate treatment of children's mental health problems (Elgar, Curtis, et al., 2003; New Freedom Commission on Mental Health, 2003) and increased responsibility for caring for children with high levels of acuity at home without appreciable resources (Grey, Knafl, & McCorkle, 2006; Scharer et al., 2009). Furthermore, caregivers' depressive symptoms and burden are frequently unrecognized and unaddressed in the clinical setting (Bussing et al., 2003; Elgar, McGrath, et al., 2004; Sivberg, 2002; Swartz et al., 2005; Tolan & Dodge, 2005). As a result, caregivers experiencing high levels of burden and/or depressive symptoms most likely will have more difficulty addressing the needs of their child with mental health problems (Elgar, McGrath et al., 2004; Verdelli et al., 2004; Weissman et al., 2006).

Relatively few studies have addressed caregivers of children with mental health problems. A preliminary study of the prevalence and severity of depressive symptoms among 155 primary caregivers of 2 to 19 year-old children showed that over half (57.4%) had at least a moderate level of depressive symptoms. Perceived personal control, role disruption, subjective distress and intangible and tangible support mediated the association between child behavior problems and caregivers' depressive symptoms. Overall, caregivers reported receiving low to moderate levels of social support and having moderate levels of perceived personal control. Moderate to high levels of both subjective and objective burden were reported (Gerkenmeyer, Perkins, Scott, & Wu, 2008).

From the same study by Gerkenmeyer et al. (2008) a secondary analysis of a subgroup of 139 biological, adoptive, and step-mothers identified differences in depressive symptoms based on demographic, threat, stressor, and resource variables (Gerkenmeyer, Perkins, Day, Austin, Scott, & Wu, 2011). High mean levels of depression ($M=20.3$) were found on the Center for Epidemiological Studies Depression Scale (Radloff, 1977). When mothers were placed into two groups (high/low) based on level of depression symptoms, those in the high depression group reported greater child behavior problems, more burden, greater role disruption, and greater likelihood of perceiving stigma and blame than those in the low depression group. In addition, the high depression group perceived relatively less personal control, lower family support, lower family empowerment, and less tangible support.

These caregivers' symptoms might be related to their child's mental health problems, such as aggressive behaviors, suicidal threats and related behavior, distress experienced by the child, and deterioration not only within the family environment, but within other settings such as the school, neighborhood, and legal system (Bussing et al., 2003; Duarte, Bordin,

Yazigi, & Mooney, 2005; Lecavalier, Leone, & Wiltz, 2006; Schieve, Blumberg, Rice, Visser & Boyle, 2007; Tan & Rey, 2005; Tomanik, Harris, & Hawkins 2004). Additionally, having a child with mental health problems frequently results in profound feelings of loss, as well as constant fear and worry about the child's future (Duchovic, Gerkenmeyer, & Wu, 2009; Mohr & Regan-Kubinski, 2001). Considering caregivers' major role in the care of a child with mental health problems, surprisingly little attention has been given to developing interventions to reduce caregivers' burden and depressive symptoms and to improve their ability to address the child's problems (Corring, 2002).

Interventions for Caregivers' Depressive Symptoms and Burden

Randomized controlled trials (RCT) for depression have compared the efficacy of cognitive behavioral therapy (CBT), including problem-solving interventions (Brewin, 1996). In a meta-analysis comparing outcomes of antidepressants and CBT in severely depressed outpatient subgroups from four RCT, no differences were found in effectiveness (DeRubeis, et al., 2005). In another meta-analysis, comparing pharmacotherapy, psychotherapy, and control conditions in remission of major depressive disorder, both antidepressant medication and psychotherapy alone were almost twice as effective as the control conditions, with no differences between treatments (Hollon et al., 2005).

Few RCT have examined use of PSI to address depression and/or burden among primary caregivers (primarily mothers) of these children, and none delivered it by telephone. Several studies, however, examining the use of PSI telephone interventions for patients (not caregivers) with depression in primary care settings showed improvements in outcomes over usual physician care, including decreased depression (Simon et al., 2004).

Conceptual Foundation for BOSC Intervention

The conceptual foundation of the Building Our Solutions and Connections (BOSC) intervention was based upon Lazarus and Folkman's transactional theory of stress and coping (Lazarus, 2000; Lazarus & Folkman, 1984), which proposes that stress results when demands of a specific transaction between an individual and her/his environment are appraised by the individual as exceeding available resources to cope with the demands (see Figure 1). Consistent with this stress and coping framework, D'Zurilla (1986) theorized that personal control is related to problem solving through one's perception that a problem is controllable and that one is able to solve the problem through one's own efforts.

The BOSC intervention is a cognitive-behavioral problem-solving intervention (PSI) that was adapted from the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) Program (Hegel & Arean, 2003). The BOSC intervention identifies primary caregivers' depressive symptoms and feelings of burden and links them to problems in living. It was proposed that primary caregivers of children with mental health problems would benefit from learning the problem-solving process, which would increase perceived personal control and problem-solving skills and, in turn, decrease burden and depressive symptoms. Strengthening emotion-focused strategies such as cognitive reframing and scheduling pleasant activities were also included to decrease the emotional impact associated with problems. Perceived personal control and problem-solving attitudes and skills were conceived as proximal outcomes and burden and depressive symptoms as distal outcomes.

Purpose of Study

The purpose of this study was to determine the feasibility, acceptability, and preliminary estimates of effect sizes for the BOSC intervention when compared to a wait list control

(WLC) group. To test feasibility, it was hypothesized that: (a) at least 75% of caregivers would complete at least 7 of the 9 problem-solving intervention sessions and (b) satisfaction ratings of the BOSC intervention participants would be at least 3.0 on a 4-point scale for at least 80% of participants. In addition, it was hypothesized that compared to the WLC group, BOSC participants would report higher perceived personal control, improved problem-solving attitudes and skills, lower perceived burden, and fewer depressive symptoms at 1-week and 3-months after the last intervention session.

Methods

Research design

An experimental design was used with an intended randomization of 66 primary caregivers to either the BOSC group or Wait-List Control (WLC) group. With a projected attrition rate of 30% (based on a small pre-pilot study of the intervention), the goal was to have 25 caregivers in each group completing the first three data collections (DC). This design provided a comparison WLC group that doubled the number of participants intended to receive the intervention while still providing a true control group for the primary analyses. Further, it encouraged participation because the WLC group knew they would receive the intervention.

Sample inclusion and exclusion criteria

To be included, participants: (a) were the primary caregiver of a child between ages 11 and 16 years who had received mental health services in Indiana within the past year; (b) were able to speak English; (c) lived with the child for at least 20 out of the past 24 months; (d) were either a biological parent, adoptive parent, foster parent, relative, or guardian of the child; (e) met the standard cut-off on the Patient Health Questionnaire-9 (PHQ-9) depression scale of greater or equal to 10 (Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004) and/or burden assessment scale of greater than or equal to a mean of 2.0 (Parent Experiences Scale [PES]) (Gerkenmeyer, Perkins, Scott, & Wu, 2008); and (f) were at least 21 years old. Caregivers were excluded if they reported having been told by a mental health professional that they had schizophrenia, bipolar disorder, substance abuse, or psychosis. Screening for inclusion, obtaining consent, sharing copies of surveys, and answering questions were carried out in person at the study site or were conducted over the telephone. When completed by phone, the consent and surveys were mailed to caregivers, material was read to them over the telephone, and participants returned the signed consent form in a stamped, addressed envelope.

Recruitment

Participants were recruited over 11 months from community mental health centers, agencies providing mental health services for children, response to ads, and calls to the research team from information on fliers. Ads were placed on websites and in newsletters of advocacy organizations, at mental health treatment centers, in newspapers, in libraries, at conferences, and over the radio (Oruche et al., 2012). If the caregiver endorsed suicidal thoughts during screening, a suicide protocol was followed (Dube, Kroenke, Bair, Theobald, & Williams, 2010). If at imminent risk of suicide, participants were connected with emergency resources. During the study, suicidal ideations were endorsed a total of 48 times by 19 different participants. Once entered in the study, participants were given an ID number to protect their identity. They received a \$10 gift card for completion of screening, a \$25 gift card for each data collection and for attending the 1-hour training session, and \$10 gift cards for each telephone intervention completed. IRB approval for this study was obtained from Indiana University. Screening and recruitment began in December 2009 and ended in September 2010.

Randomization

Following consent, caregivers were randomly assigned to either the BOSC or WLC group. Randomization was blocked and stratified by level of child behavior problems (≥ 64 vs. < 64 on the Child Behavior Checklist [CBCL] Total Behavior Problems T-score (Achenbach, 1991), caregiver depression (≥ 10 vs. < 10 on the PHQ-9), and burden (≥ 2 vs. < 2 on PES). Prior to opening the study, the study statistician generated random assignments to BOSC or WLC for each of the six strata. The project manager then carried out the enrollment and randomization of eligible participants.

Intervention

The BOSC intervention began with a one-hour, face-to-face training session and was followed by up to eight weekly telephone interventions that lasted about 30 minutes each (9 PSI sessions total). The intervention began in February 2010 and ended in June 2011. Consistent with the IMPACT Program, depression was measured during each intervention using the PHQ-9 (Lowe et al., 2004) to monitor participants' wellbeing. During each PSI session, participants learned to enact seven prescribed steps that guided their problem-solving: (1) evaluating outcomes from the previous week (except for the first week), (2) selecting and defining a problem, (3) establishing realistic and achievable goals for problem resolution, (4) generating multiple solution alternatives (brainstorming), (5) implementing decision-making guidelines (pros and cons), (6) evaluating and choosing solutions, and (7) implementing the caregiver-selected solutions. Following these steps each week, participants applied individualized solutions to their self-selected problem areas. If a call was not completed during a given week, it was omitted to stay within the eight-week timeframe.

Data collection

Data were collected from January 2010 through October 2011. Data collectors were blinded to group assignment with a few exceptions noted below. Data collection for both groups occurred at: (a) baseline (DC 1), (b) one week after the last of 8 weekly scheduled BOSC telephone interventions (DC 2), (c) three months after completion of the BOSC group's intervention (DC 3), and (d) six months after completion of the BOSC group's intervention, which was also after the last of eight weekly calls for the WLC group (DC 4). Data collection occurred in stratified randomly assigned cohorts of 2 to 10 primary caregivers. After completing the 3-month post-intervention data collection in the BOSC group in a particular cohort, the WLC group cohort began the intervention. At that point, the WLC group no longer served as a control. The WLC group cohort had follow-up data collection the week after completing the 8 weekly calls and, at the same time, the BOSC group cohort completed a 6-month post-intervention data collection (DC 4). Three months later, the WLC group completed a 3-month post-intervention data collection (DC 5). The 6-month post-intervention data collection for the BOSC group provided an opportunity to examine if improvements were maintained over time.

Treatment fidelity: Procedures for the BOSC intervention

Interveners included one doctoral-prepared and six masters-prepared clinicians who had an average of 14.3 years of experience in a mental health specialty area. Interveners were trained using a manual adapted from the IMPACT Program (Hegel & Arean, 2003). Training involved listening to lectures, engaging in role-plays, viewing a PSI training video, and receiving feedback about using PSI. Interveners audio-taped their telephone interventions for review by experienced doctoral-prepared trainers and received feedback at regularly scheduled supervision sessions. Research assistants blinded to group assignment received training and supervision in collecting data separate from interveners' supervisory sessions to prevent the potential for treatment diffusion to the WLC group. Out of 116 data

collections, 15 were not blinded primarily because participants revealed their group assignment. A total of 27 participants received at least a portion of the intervention in the BOSC group and 19 did so in the WLC group.

Instruments

Demographics—Demographic variables included both child (e.g., age) and primary caregiver characteristics such as caregiver age, gender, race, and income. Child characteristics included information on length and seriousness of mental health problems. Caregiver characteristics included information on use of antidepressant medications.

Child Characteristics—Child behavior problems in the child were measured using the Child Behavior Checklist (CBCL). The CBCL is a well-known instrument with norms for age and gender and strong support for reliability and validity (Achenbach, 1991).

Proximal Outcomes/Appraisal—Proximal outcomes measured were perceived personal control and problem-solving attitudes and skills. Perceived personal control refers to beliefs about one's ability to manage a situation and was measured by the 7-item *Pearlin Mastery Scale (PMS)* (Pearlin & Schooler, 1978) on 4-point Likert response scales from 0 (*strongly disagree*) to 3 (*strongly agree*). Items were reverse scored so a higher score reflected greater perceived control. Coefficient alphas were 0.69 at baseline (DC 1), 0.77 at DC 2, and 0.71 at DC 3.

Problem-solving attitudes and skills, measured by the 52-item Social Problem Solving Inventory-Revised, Long Version, (SPSI-R:L; D'Zurilla & Nezu, 1990), included measures of PS, solution implementation, problem orientation (positive and negative), and PS styles (rational, impulsivity/carelessness, and avoidance). Each item was rated on a 5-point scale from 0 (*not at all true of me*) to 4 (*extremely true of me*) with a higher score reflecting a stronger orientation or style. Coefficient alpha in this study was 0.96 at baseline (DC 1) and DC 2 and 0.97 at DC 3.

Distal Outcomes—Distal outcomes measured were depressive symptoms and burden. Depressive symptoms were measured by the 21-item *Beck Depression Inventory II (BDI-II)*, a self-report scale. Each item has four statements about a specific symptom of depression listed in increasing levels of severity and with the participant reflecting back on the past 2 weeks. A higher score reflected greater depression symptoms. The BDI-II has strong support for reliability ($\alpha = .88$) and validity (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). In this study coefficient alphas were 0.92 at DC 1 and 0.94 at DC 2 and DC 3.

Burden—Burden served as a proxy measure for stress and referred to caregivers' distress related to caring for a child with mental health problems. It was measured by the 19-item *Parent Experiences Scale (PES)* (Gerkenmeyer, Perkins, Scott, & Wu, 2008), which was adapted from Reinhard's *Burden Assessment Scale (BAS)* (Reinhard, 1994) for caregivers of adults. Item responses include a 4-point Likert response scale with 1 (*not at all*) to 4 (*a lot*). A higher score reflected greater burden. Coefficient alphas for total burden were 0.82, 0.83, 0.91, and 0.89 at screening, DC 1, DC 2, and DC 3, respectively.

Acceptability of the BOSC Intervention—Acceptability was measured by the 8-item *Client Satisfaction Questionnaire (CSQ-9)* (Attkisson & Zwick, 1982). The eight-item CSQ-9 had four response choices and very good internal consistency reliability ($\alpha = 0.93$) and construct validity in this study. Items addressed the quality of services, if services met participants' needs, if they would return or refer others, and satisfaction with the amount of help received.

Statistical Methods

Two-sample t-tests, chi-square, and Fisher's exact tests were used to compare demographic, screening, and baseline variables between the groups and between subjects who dropped out prior to DC 3 and those who completed DC 3. Analysis of covariance was used to test for group differences on each outcome variable. Separate models were fit at DC 2 and DC 3. Each model was adjusted for the baseline value of the outcome measure, as well as the baseline Beck Depression Inventory- II (BDI-II), Parent Experiences Scale (PES) total score, total CBCL behavior score, total Social Problem-Solving Inventory (SPSI) score, and Pearlin Mastery Scale (PMS) score. The baseline total SPSI score was not included in the model for the SPSI subscale analyses because the baseline subscale score was already included in the model. Partial η^2 was used to estimate effect sizes using SPSS for ANCOVA (small .08; medium .09-.24; large .25). Partial η^2 represents the percent variance in the outcome variable explained by group, while controlling for baseline value of the outcome variable and other covariates.

Taking advantage of the WLC group's post-intervention data, the BOSC and WLC groups' data were combined and models were used comparing the baseline to 1-week and 3-month post-intervention scores, respectively. For BOSC participants, DC 1 was baseline, DC 2 was immediate post-intervention, and DC 3 was 3-month follow-up. For WLC participants, the corresponding data collections were DC 3, DC 4, and DC 5.

To explore the long-term effect of the intervention, models were fit comparing the BOSC participants' DC 3 scores to their DC 4 scores (that is 3-month vs. 6-month follow-up). The same baseline values were included in the post-hoc models as in the primary analyses. Hochberg's step-up Bonferroni adjustment was used to control for examining 9 outcomes per analysis.

Three sets of post-hoc analyses were conducted. The first two post-hoc analyses were completed to determine who may have benefited the most from the BOSC intervention. The third post-hoc analysis was completed to verify that any effects seen were not due solely to the use of antidepressant medication. First, the analysis of covariance models testing for group effects were re-run, stratified by depression at screening and by examining the effects in depressed compliers only, where compliance is defined as BOSC participants completing the face-to-face and at least 6 of the 8 telephone intervention sessions (7 of 9 PSIs total). All WLC participants were included in this analysis. Second, the previous post-hoc analysis was repeated stratifying by burden (< 2.5 vs. \geq 2.5). Third, one BOSC and 2 WLC caregivers were identified as starting antidepressant medications one month prior to the intervention through DC 3. The analysis of covariance models testing for group effects were re-run omitting these three caregivers.

Results

There were 30 eligible participants randomized to the BOSC group and 31 to the WLC group. In addition, 24 (80%) BOSC and 27 (87%) WLC caregivers completed DC 3. For details on caregiver eligibility, exclusion, and participation at follow-up data collections, see Figure 2 (Consort Diagram).

The mean (SD) caregiver age was 42.7 (9.2) years; 97% (n = 59) were female, 57% (n=35) were Caucasian, and 39% (n=24) were African American. Of the caregivers, 36 (59%) qualified for the study based on high burden only; 3 (5%) based on high depression only, and 22 (36%) based on both high burden and depression. The groups did not differ on caregiver sex, race, age, burden on the PES, or depression on the PHQ-9 at screening, or at baseline on the total CBCL problems score (all $p>0.2$; Table 1).

There were no significant differences between the groups on any primary outcome measures at baseline (all $p > 0.1$; Table 2). A total of 16 subjects dropped out before the third data collection, 3 in the BOSC group and 13 in the wait-list control group (26% overall). There were no significant differences between dropouts and those who completed the study on screening PES or PHQ-9 or baseline CBCL total behavior problems (all $p > 0.1$).

Feasibility and Acceptability

Of the 30 BOSC caregivers, 18 (60%) completed at least seven of the PSIs. The mean (median) number of interventions attended was 6.2 (7.5). Eight caregivers (27%) completed all nine interventions. The mean (SD) caregiver satisfaction rating in the BOSC group after the final telephone call (DC 2) was 3.5 (0.6) with only six (23%) having a score below 3 on the 4-point scale.

Of the 31 WLC caregivers, 12 (39%) dropped out of the study prior to the start of the intervention. Thirteen (42%) completed at least seven of the PSIs. The mean (median) number of interventions attended was 4.4 (5). Seven caregivers (23%) attended all nine interventions. The mean (SD) caregiver satisfaction rating in the WLC group after the final telephone intervention (DC 2) was 3.4 (0.5). Three (18%) of the WLC caregivers had a score below 3.

In an exit interview, comments from participants were primarily positive. Of 44 participants, 18 provided only positive feedback about the intervention, 6 provided responses that were both positive and negative, 11 provided recommendations and/or negative feedback only, and 9 had no specific feedback. Examples of negative feedback were: “not just so much of the cut and dried questions,” “the face-to-face would be better than a lot of the telephone stuff,” “it would have been more helpful for the clinician to give me suggestions than for me to try to think of more things when I am already empty,” and “by the 4th call, it became predictable in a negative way.” Positive feedback included that the intervention helped, interveners provided encouragement and kept them “accountable to do what they said they were going to do”, it “helped them accomplish things” and it “broke things down” so they were “not so overwhelmed.” Examples of what they shared included: “I got back a little piece of me” and “quit making it the end of the world”; “I felt like I was really starting to make headway”, “it gave me a lot to work with”; “the person I worked with helped me so much, not only did she listen to me and help me problem solve, she actually was a way for me to vent without feeling bad about what I had to say...so, she was excellent”; “I certainly learned a lot of things about myself and about how I feel with my child. I’d love to do this again.”

Recommendations included more face-to-face meetings, sending an e-mail reminder about the upcoming scheduled PSI, having the intervener give suggestions versus having the participant come up with suggestions, and involving the child in the sessions. Six participants identified challenges such as having difficulty doing a pleasurable activity, having so much else going on in life that it was necessary to end participation in the study, the interveners and callers stepping into a situation with people they do not know, and feeling that they have problems too difficult and too large to be addressed in this type of service.

Effect Sizes

Group effect sizes for all outcome measures at DC 2 and 3 are provided in Table 3. At DC 2, all effect sizes were small ($< .04$) and there were no differences between the groups. At DC 3, the effect size for personal control (as measured by the PMS) was .08 and for burden (as measured by the PES) was .07.

Combined Group Analyses

When the BOSC and WLC groups were combined, both depression (as measured by the BDI-II) and burden were significantly lower immediately post-intervention than at baseline ($p=0.0224$ and $p=0.0022$, respectively). Depression and burden remained significantly lower at the 3-month follow-up compared to baseline ($p=0.0056$ and $p=0.0008$, respectively).

Long-term Effect

When the BOSC group was followed 6 months post-intervention, the BOSC participants' depression significantly increased from 3 months (DC 3) to 6 months (DC 4) ($p=0.0039$), returning to baseline level, indicating the intervention did not have a long-term effect on depression symptoms. However, burden scores did not significantly increase from DC 3 to DC 4 ($p=0.7179$), indicating the intervention continued to have a positive effect on caregiver burden 6 months post-intervention.

Post-hoc Analyses

When analyses were repeated stratifying by depression measured at screening, the effect sizes immediately post intervention for depression symptoms, total problem-solving raw score and the problem-solving styles of avoidance, impulsivity/carelessness, negative problem orientation, and positive problem orientation were all in the medium to large range (.09-.25) for caregivers with depression; however, the WLC group had more favorable results.

The effect size for burden was large (.27) with the BOSC group having lower burden scores. At the 3-month post intervention data collection, the effect size for personal control was .19 and for burden was .14 for caregivers with depression. The BOSC group had greater personal control and lower burden than did the WLC group. Adjusted means for personal control and burden for depressed caregivers at DC 1, DC2, and DC3 are displayed graphically in Figure 3. The effect sizes at DC 2 and DC 3 for all outcomes were small (.05) for caregivers without depression symptoms.

When analyses were repeated on the subsample of caregivers who had both high depression symptoms and completed at least 7 of the 9 intervention sessions, at DC 2 the effect sizes for positive problem orientation style (.43), and total problem-solving (.32) were even more pronounced, and again the WLC group had more favorable outcomes. The effect size for burden was also more pronounced (.43) with the BOSC group having lower burden scores than WLC. The effect sizes for all other outcomes were small (.05). At DC 3, the effect size for personal control was .36 and the effect size for burden was .12. The effect size for problem-solving avoidance was .12 and for negative problem orientation styles was .11. In all cases the BOSC group had more favorable outcomes than WLC. All other effect sizes were .04 or less.

When analyses were repeated stratifying by burden measured at screening, the effect sizes immediately post intervention for the total SPSI raw score (.11) and the problem-solving avoidance (.11) and impulsivity/carelessness subscales (.10) were medium, but WLC had more favorable outcomes than did the BOSC group.

At the 3-month post intervention data collection, the effect size for burden approached medium (.07), and the effect size for the problem-solving negative problem orientation subscale was large (.28). The BOSC group had more favorable results than did WLC group. All other effect sizes were small (.02).

When analyses were repeated stratifying on the subsample of caregivers who had both higher burden symptoms and completed at least 7 of the 9 intervention sessions, the effect size for the problem-solving subscale negative problem orientation was large at both DC 2 and 3 (.24 and .39, respectively). BOSC had lower negative problem orientation scores than did WLC at both times. At DC 3 the effect sizes for the total problem solving raw score and the problem solving impulsivity/carelessness subscale were in the medium range (.12 and .08, respectively) with BOSC having more favorable problem solving scores than WLC. All other effect sizes were .05.

The effect sizes were qualitatively similar when the three caregivers, who started antidepressant medication just prior to intervention through completion of DC 3, were excluded from the analysis. Results are available upon request.

Discussion

The BOSC intervention was pilot tested on primary caregivers of children with mental health problems who were experiencing either burden and/or depression symptoms. A total of 24 BOSC and 27 WLC group caregivers completed DC 3. No differences were found between the BOSC and WLC groups at baseline, immediate post intervention, or at 3-months post intervention. When BOSC and WLC groups were combined, both depression and burden were significantly lower immediately post-intervention than at baseline and remained significantly lower at the 3-month follow-up. Depression symptoms in the BOSC group increased between 3 and 6-months post intervention and returned to baseline levels. In contrast, burden scores did not increase during this same period indicating that the intervention had a longer lasting effect on burden. Post hoc analyses indicated that effect sizes were highest for primary caregivers who had both high depression and completed most of the intervention sessions. Discussion focuses on feasibility and acceptability, intervention effects, and implications for future research.

Feasibility and Acceptability

The ability to recruit the planned number of participants suggests that the program has an appeal for parents of children with mental health problems. Moreover, because most participants screened met inclusion criteria for either high burden or depression is further indication that there are a substantial number of parents of children with mental health problems who are in need of an intervention such as BOSC to reduce these symptoms. A final observation was that almost all of the caregivers had burden, either alone or in combination with depression, suggesting that burden might be a motivator for participation in a problem-solving intervention.

Although the relatively high satisfaction scores provide empirical support for acceptability of the intervention, almost one-fourth of the participants had an average satisfaction score below 3 on the 4-point scale, and the completion rate for BOSC sessions was 60%. Based upon the feedback from exit interviews, it may be that having the option of doing more face-to-face PSI interventions might improve participation and satisfaction scores. Additionally, providing the option of an e-mail or telephone reminder might result in increased participation.

Intervention Effects

Although there were no significant differences between the BOSC and WLC groups, either immediately or at 3 months after the intervention, results provide some preliminary indications that the intervention was having the desired effects on selected outcomes. In the combined group analysis, findings showed that the BOSC intervention had an effect on the

distal outcomes of burden and depression, especially immediately after participants completed the intervention. In addition, when outcomes were explored for the subgroup of caregivers who were depressed at baseline, medium effect sizes were found for both burden and depression at the 3-month post intervention data collection. This finding is especially important because the intervention appears to have had the greatest effect on those caregivers who were the most burdened or depressed. Moreover, improvement in burden remaining at six months after the intervention indicates that caregivers might have continued to use some of the skills that they gained during the intervention. The lack of sustained improvement in depression in the caregivers who were depressed at baseline, however, suggests that a longer intervention might be considered in future studies. For example, booster sessions beginning at three months might be considered.

It was beyond the scope of this study to identify which components of the intervention (e.g., cognitive reframing or scheduling pleasurable activities) were linked to improvements in burden and depression symptoms. In future studies, this would provide important information about what might need to be strengthened to help caregivers avoid having depression symptoms return to baseline levels. Future studies could also explore if there were any differences in caregiver outcomes based on length of time since the child received mental health treatment or family socio-demographic characteristics such as race, culture, and household income.

It was unanticipated that a problem-solving intervention would not show an improvement in problem solving. One explanation is that measurement of problem-solving did not capture positive early changes gained as part of the intervention. The subgroup analyses of depressed caregivers revealed an initial negative effect of the intervention on problem solving styles, which diminished from immediately post-intervention to three months. It could be that in the depressed group, participants initially (DC 2) rated themselves worse than controls because they were unaccustomed to this new method of approaching problems. By DC 3, the effect sizes were near zero or had even switched to medium effect sizes in favor of the BOSC group in the case of depressed compliers.

In the subgroup analyses on burden, it was unexpected that those with lower burden would show relatively greater improvement in perceived control than those with higher burden. The majority of participants qualified to be in the study because of high burden. It might be that a problem solving intervention is most effective on perceived control when burden is relatively moderate. In those with a very high burden, a longer intervention might be needed.

The finding of improvement of perceived control at 3-months post intervention is consistent with perceived control being a mediator between stressors and burden in the theoretical model (Lazarus, 2000; Lazarus & Folkman, 1984). This finding also suggests that future studies testing the model should identify if changes in perceived control lead to changes in burden and depression. Finally, future research is needed to examine if improvement in the caregiver after the BOSC intervention is associated with improvement in child mental health problems.

Clinical Implications

Although this was a pilot study and the small sample sizes (especially in the subgroup analyses) limit generalizations, there are some important findings for the clinical setting. The dropout rate was substantially higher in the wait-list control group which suggests that, if such a program were offered in the clinical setting, the program should be readily available without lengthy delays. Reductions in degree of burden in caregivers over time suggest that this intervention should be considered for parents who are experiencing burden. For caregivers with depressive symptoms, it will be necessary to monitor their level of

depressive symptoms over time. The PHQ-9 depression scale can be effectively used in the clinical setting to monitor caregivers' levels of depression on an ongoing basis (Lowe et al., 2004).

Problems in children with mental health needs are often chronic and, as children enter different developmental stages, new problems can emerge and caregivers might need additional help to reduce their resulting burden and depressive symptoms. Based upon findings from this pilot study, it is important that both primary caregivers and mental health providers be aware that addressing depression is often a long-term endeavor, however interventions such as BOSC appear to have the potential to diminish these caregivers' distress.

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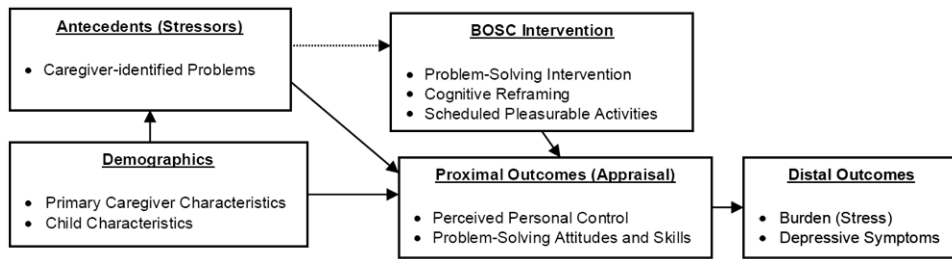


Figure 1.
BOSC Intervention Model for Caregivers of Children with Mental Health

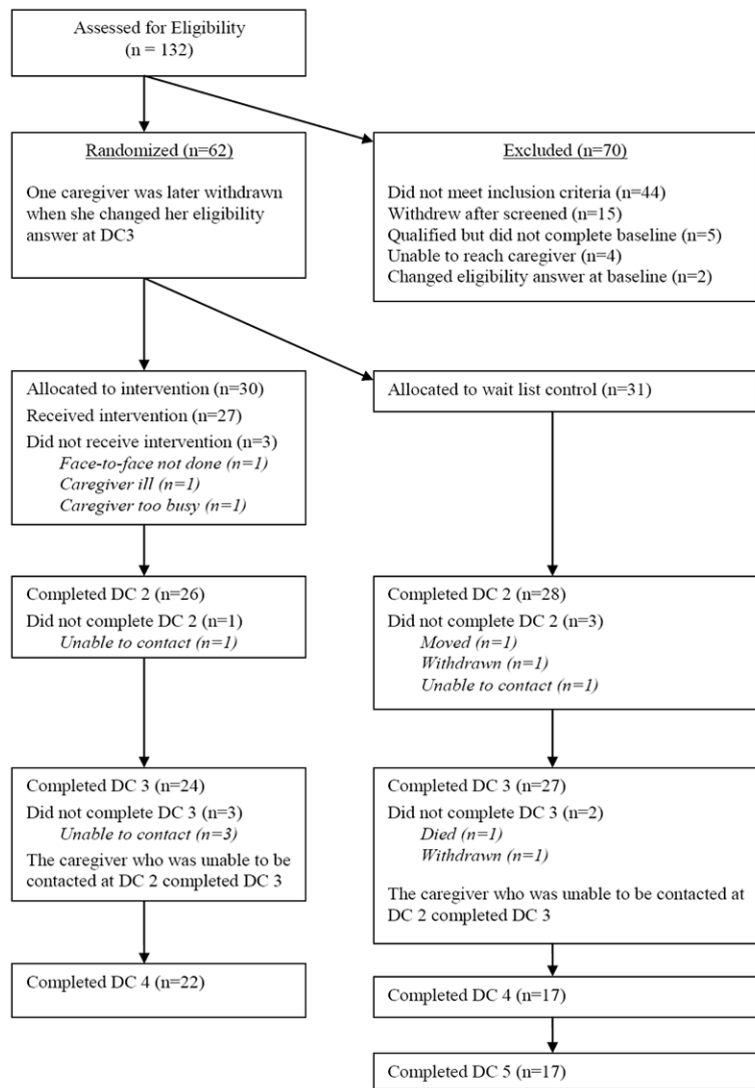
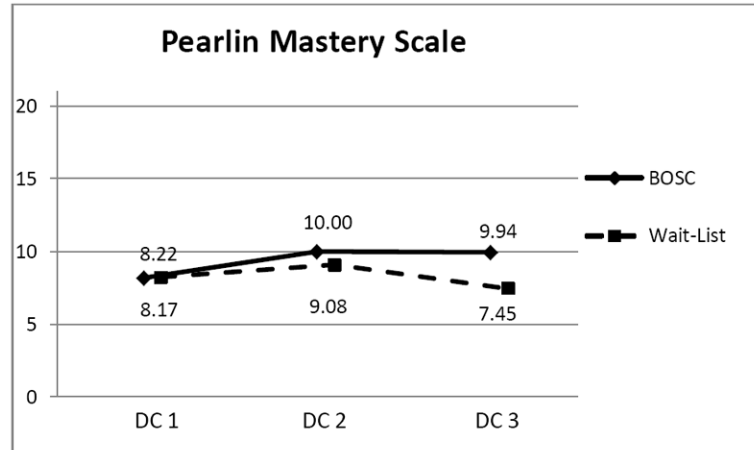


Figure 2.
Consort Diagram

a. PMS – Personal Control



b. PES - Burden

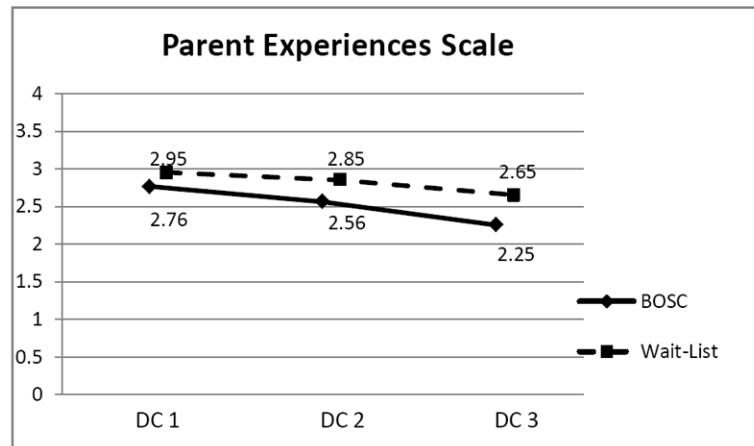


Figure 3. Adjusted Means for PMS and PES by Group over Data Collections 1, 2, and 3 for Depressed Caregivers

Table 1

Comparison of Demographic and Screening Variables by Group

	BOSC						WLC						p-value*
	n	Mean	STD	Min	Max		n	Mean	STD	Min	Max		
Age	30	44.1	9.9	32	69		31	41.4	8.4	26	59	0.2483	
Parent Experiences Scale (Screening)	30	2.7	0.5	1.5	3.8		31	2.8	0.5	1.9	3.6	0.5195	
Patient Health Questionnaire-9 (Screening)	30	8.5	6.8	0	24		31	8.9	6.3	0	24	0.8263	
Child Behavior Checklist Total Problem Score (Baseline)	29	72.2	8.1	55	90		27	72.0	7.5	55	86	0.9356	
Sex	n	%					n	%				p-value [‡]	
Male	2	7					0	0				0.2377	
Female	28	93					31	100					
Race													
Caucasian	17	57					18	58				0.5342	
AA	11	37					13	42					
Other	2	7					0	0					

* Two-sample t-test

[‡]Fisher's Exact Test

Table 2

Comparison of Outcome Variables at Baseline

	BOSC					WLC					p-value*
	n	Mean	STD	Min	Max	n	Mean	STD	Min	Max	
Beck Depression Inventory	30	21.4	14.8	1	48	31	20.7	10.5	4	53	0.8419
Pearlin Mastery Scale	30	7.6	4.2	0	16	31	7.3	3.5	1	19	0.7316
Parent Experiences Scale	30	2.7	0.5	1.6	3.8	31	2.8	0.6	1.1	3.6	0.4042
Social Problem Solving Inventory											
Avoidance Style	30	8.4	6.7	1	23	31	7.7	6.2	0	23	0.6780
Impulsivity/Carelessness	30	9.1	8.2	0	29	31	9.8	7.3	0	28	0.7233
Negative Problem Orientation	30	13.8	10.1	0	36	31	14.3	9.9	0	40	0.8588
Positive Problem Orientation	30	13.0	3.7	5	20	31	11.5	4.4	2	20	0.1503
Rational Problem Solving	30	47.0	15.0	18	78	31	41.0	16.7	3	72	0.1449
Total Raw Score	30	13.5	3.5	5.9	18.7	31	12.8	3.7	3.2	18.8	0.5048

* Two-sample t-test

Table 3

Group differences

	Data Collection 2 (n _{BOSC} =26; n _{WLC} = 28)				Data Collection 3 (n _{BOSC} =24; n _{WLC} = 27)					
	F	p	η^2	O [‡]	R ²	F	p	η^2	O [‡]	R ²
Beck Depression Inventory	.28	.600	.01*	.08	.73	.06	.807	<.01	.06	.68
Pearlin Mastery Scale	.39	.536	.01*	.09	.66	3.26	.078	.08	.40	.69
Parent Experiences Scale	.50	.485	.01	.11	.44	3.14	.084	.07	.41	.33
Social Problem Solving Inventory										
Avoidance Style	.54	.465	.01*	.11	.62	.04	.833	<.01	.06	.64
Impulsivity/Carelessness	.67	.418	.02*	.13	.57	.30	.587	.01*	.08	.63
Negative Problem Orientation	.92	.343	.02*	.16	.70	.33	.570	.01	.09	.70
Positive Problem Orientation	.27	.604	.01*	.08	.45	.24	.629	.01	.08	.48
Rational Problem Solving	.24	.624	.01*	.08	.37	.20	.654	.01*	.07	.42
Total SPSI-R:L Raw Score	1.61	.211	.04*	.24	.74	.03	.870	<.01	.05	.73

[‡] Observed power

* WLC had more favorable outcome

Table 4

Effect sizes for caregivers with and without depression at screening

	Data Collection 2		Data Collection 3	
	Depressed (n _{BOSC} =11; n _{WLC} = 12)	Not Depressed (n _{BOSC} =15; n _{WLC} = 16)	Depressed (n _{BOSC} =9; n _{WLC} = 12)	Not Depressed (n _{BOSC} =15; n _{WLC} = 15)
Beck Depression Inventory	.09 *	<.01	<.01	<.01
Pearlin Mastery Scale	.06	.01	.19	.03
Parent Experiences Scale	.27	.00	.14	.03
Social Problem Solving Inventory				
Avoidance Style	.12 *	.05	.02	.01 *
Impulsivity/Carelessness	.14 *	.03	<.01	.04 *
Negative Problem Orientation	.21 *	<.01	.02	.00
Positive Problem Orientation	.18 *	.01	<.01	.04
Rational Problem Solving	.04 *	.00	.01	<.01
Total Raw Score	.25 *	.02	<.01	.02 *

* WLC has more favorable outcome

Table 5

Effect sizes for caregivers with higher and lower burden scores at screening

	Data Collection 2		Data Collection 3	
	Burden ≥ 2.5 (n _{BOSC} =16; n _{WLC} =20)	Burden < 2.5 (n _{BOSC} =10; n _{WLC} =8)	Burden ≥ 2.5 (n _{BOSC} =14; n _{WLC} =20)	Burden < 2.5 (n _{BOSC} =10; n _{WLC} =7)
Beck Depression Inventory	0.01 [*]	0.00	0.00	0.00
Pearlin Mastery Scale	0.01 [*]	0.10	0.02	0.29
Parent Experiences Scale	0.03	<0.01	0.07	0.06
Social Problem Solving Inventory				
Avoidance Style	0.11 [*]	0.02	<0.01	0.05 [*]
Impulsivity/Carelessness	0.10 [*]	0.03	<0.01	<0.01
Negative Problem Orientation	<0.01	0.32 [*]	0.28	0.42 [*]
Positive Problem Orientation	0.04 [*]	<0.01	<0.01	0.00
Rational Problem Solving	<0.01	<0.01	<0.01	0.14 [*]
Total Raw Score	0.11 [*]	<0.01	<0.01	0.02 [*]

* WLC has more favorable outcome