A Novel 2-week Intensive Multimodal Treatment Program for Child Sexual Abuse (CSA) Survivors is Associated with Mental Health Benefits for Females aged 13-16

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Abstract

Objective: The aim of this study was to evaluate the psychiatric outcomes for the first cohorts of adolescent female Child Sexual Abuse (CSA) survivors after two-weeks in an intensive multimodal treatment program designed for this population. Methods: Baseline data was collected at intake and again immediately prior to discharge. Data collected included demographic information, as well as measurement of standardized scales for PTSD, depression, anxiety, quality of life, self-esteem, and resilience. Mean scores at baseline and discharge were statistically analyzed to assess for changes following the treatment program on these measures. Results: From the first twenty-seven (27) adolescent female CSA survivors, who completed two-weeks of the multimodal treatment program, all three symptomatic scales showed statistically significant improvements from baseline. There were decreases in mean questionnaire scores for Depression (-23.8%, p = 0.001), Anxiety (-20.6%, p = 0.006), and PTSD (-20.3%, p = 0.002), as well as decrease of nearly 50% in the number of participants who were having active suicidal thoughts. In keeping with this, there were also statistically significant improvements in ratings for Quality of Life (17.6%, p = 0.022), Self-Esteem (22.9%, p = 0.010), and Resilience (6.9%, p = 0.019). Conclusion: This study presents preliminary findings from an intensive two-week multimodal treatment program specifically designed to help survivors of child sexual abuse (CSA). The highly positive short-term findings suggest that further longer-term follow-up in larger groups is appropriate. These preliminary results also support ongoing research for such intensive multimodal programs.

Key Words: child sexual abuse; adolescent mental health; developmental trauma; mental health treatment; complex multimodal treatment

Résumé

Objectif: La présente étude visait à évaluer les résultats psychiatriques des premières cohortes d’adolescentes survivantes d’abus sexuels sur des enfants (ASE) après deux semaines d’un programme de traitement multimodal intensif conçu pour cette population. Méthodes: Les données de base ont été recueillies à l’admission et de nouveau, immédiatement avant le congé. Les données recueillies comprenaient l’information démographique ainsi que les mesures aux échelles normalisées du trouble de stress post-traumatique (TSPT), de la dépression, de l’anxiété, de la qualité de vie, de l’estime de soi et de la résilience. Les scores moyens à la base et au congé ont été statistiquement analysés pour évaluer les changements suite au programme de traitement sur ces mesures. Résultats: Pour les vingt-sept (27) premières adolescentes survivantes...
Introduction

Child sexual abuse (CSA) is an all too common form of early-life trauma that affects youth across the globe. CSA encompasses a diverse set of sexually-related behaviours, including intercourse, attempted intercourse, genital contact, and exposure to adult sexual activity or pornography (Putnam, 2003). It is estimated that 1 in 6 females and 1 in 12 males experience at least one significant incident of sexual abuse prior to adulthood (Chiu et al., 2013; Martin & Silverstone, 2013; Finkelhor, 1994). Young females are particularly susceptible to CSA, with approximately 20% of females in Canada and the United States experiencing some form of sexual abuse before the age of 18—making them more than at least twice as likely to experience CSA than males (MacMillan, Tanaka, Kuku, Vaillancourt, & Boyle, 2013; Stoltenburg, van Ijzendoom, Euser, & Bakermans-Kranenburg, 2011). Individual experiences can vary considerably, and this can manifest into a variety of negative longer-term psychiatric outcomes. Evidence indicates that there are common and persistent mental health consequences related to exposure to CSA, including elevated risk for post-traumatic stress disorder (PTSD), depression, anxiety, substance abuse, suicidal ideation, eating disorders, sexual dysfunction, and cognitive deficits (Bucker et al., 2012; Chen et al., 2010; Maniglio, 2009; Robert, O’Connor, Dunn & Golding, 2004; Beitchman et al., 1992). The most common outcome for CSA victims is PTSD, with an estimated 36% of children who are exposed to CSA later meeting the criteria for a PTSD diagnosis (Berline & Elliot, 2002). With growing awareness of the prevalence of CSA, increasingly more adolescents have disclosed their abuse, particularly closer to the time of the incident(s) rather than delaying disclosure (McElvaney, 2015). For these reasons, as well as a possible increase in the incidence of CSA, it has become essential for mental health professionals to develop novel interventions aimed at directly treating the effects of CSA.

At present, there is limited research clarifying the best-practice treatment for CSA survivors—this is particularly true for youth (Hetzel-Riggin, Brausch, & Montgomery, 2007). Current literature on treatment options for children subjected to maltreatment have shown Cognitive Behavioural Therapy (CBT), in particular Trauma-Focused Cognitive Behavioural Therapy (TF-CBT), to be the most effective in treating victims of CSA (Fraser et al., 2013; Macdonald et al., 2012; Cohen, Deblinger, Mannarino, & Steer, 2004). This appears to be particularly true for CBT interventions that involve non-offending caregivers (Deblinger, Stauffer, & Steer, 2001). That being said, comparative literature between treatment options is lacking and requires further research (Fraser et al., 2013).

One of the primary challenges in developing an effective treatment program is the diversity of circumstances incorporated with the traumatic incident(s). It is important to note that CSA is not a disorder, it is a specific form of trauma that can manifest into a varied set of negative outcomes (Macdonald et al., 2012). The age and sex of the child or adolescent, the frequency or number of incidents, as well as the child’s relationship to the perpetrator, are all relevant factors that can influence treatment outcomes (Putnam, 2003). Other treatments, including art therapy, animal assisted therapy, play therapy, eye movement desensitization and reprocessing (EMDR), and group therapy, are also considered viable treatment options (Wesselmann, Armstrong, Schwietzer, Davidson, & Potter, 2018; Shapiro, 2014; D’Andrea, Bergholtz, Fortunato, & Spinazzola, 2013; Dietz, David, & Pennings, 2012; Heenan, 2006; Tourigny, Hebert, Daigneault, 2005; Pashall, 2003; Trowell et al., 2002). There is some preliminary evidence that incorporating a number of different therapeutic options, centered around TF-CBT, into one comprehensive regimen—an intensive multimodal treatment program—could be beneficial for child CSA victims, especially those with CSA-induced PTSD (Silverstone Greenspan, Silverstone, Sawa, & Linder, 2016a; Silverstone et al., 2016b). However, there is limited research investigating the effects of an intensive multimodal program for CSA survivors—this is particularly true for adolescent female CSA victims. The implementation of such a program has the capability to induce...
long-term positive effects across a number of affected mental health domains.

The current research aims to assess a novel, intensive multimodal treatment program for adolescent female CSA survivors carried out at a dedicated facility, the Be Brave Ranch. By comparing self-report outcome measures over the course of 2-weeks of treatment, we assessed the effect initial treatment had on a variety of mental health domains. In doing so, we hoped to examine evidence for the potential efficacy of the treatment regimen, which may additionally help with future implementation of similar programs.

Materials and Methods

Study Design

This study was conducted as a part of an novel ongoing treatment program at the Be Brave Ranch, an independent facility described below, which is dedicated to treating child and adolescent CSA victims. Participants were recruited from October 2018-November 2019. As a standard part of the program, each participant completes a number of psychiatric self-report questionnaires aimed at assessing different psychiatric outcomes. All surveys were administered by staff at the Be Brave Ranch. Surveys were administered at initial admission (baseline) and again immediately prior discharge after 2-weeks in the treatment program. Anonymized data was sent to a third-party server where it was encoded and sent to the researchers for a secondary independent analysis of the collected data. Changes in scores over the course of treatment were determined in order to assess the potential efficacy of the program.

We performed an independent analysis of the anonymized data. This second-level independent analysis of previously collected data was approved by the University of Alberta Human Research Ethics Committee (Ethics review number: Pro00089614).

Treatment Program

Each participant attended a residential facility known as the “Be Brave Ranch” (BBR). The Be Brave Ranch is funded through a not-for-profit charitable organization that relies solely on donations. The current adolescent girls program has the capacity to treat up to six individuals per cohort. Each cohort receives 8-weeks of treatment divided into four 2-week visits that occur at baseline, 3-months, 6-months, and 1-year. At present, the Be Brave Ranch’s Adolescent Girls Program treats 5-7 cohorts/year, translating into roughly 30-40 individuals per annum. The present report is for the first 2-weeks only, and reports data for all initial cohorts.

Inclusion criteria for the program included:
- individual is biologically female,
- 13-16 years of age (with potential exceptions for mature minors),
- psychologically-minded/able to benefit from therapy,
- IQ >80 as determined by previous assessments,
- medically stable and compliant with medications,
- family/caregiver is identified and involved,
- Caregivers are not directly involved in the treatment process, but caregiver involvement outside of the program is imperative. Furthermore, the adolescent must have disclosed their abuse to at least one caregiver.
- completion of a readiness assessment.

A total of 31 participants were admitted into the program for treatment. Of the 31 participants admitted into the program, four were omitted from the study—three individuals dropped out shortly after admission and therefore had no second data point. There were no significant differences between the baseline data from the drop-out participants and that of those who were included in the study. One participant incompletely answered a number of questions at both timepoints and was excluded for having incomplete information.

Program Design

The intensive multimodal treatment program includes the following therapies:

1. Trauma-Focused Cognitive Behavioural Therapy (TF-CBT)
2. Group Therapy
3. Individual Therapy
4. Eye Movement Desensitization and Reprocessing (EMDR)
5. Yoga and Meditative Therapy
6. Art Therapy
7. Music Therapy
8. Cultural Activities
9. Recreational Therapy
10. Animal-Assisted Therapy

Although there is a general schedule for each therapy, the allocation of time differs based on which visit the participants are attending, as well as for each individual participant based on their particular needs.

The program’s therapeutic framework is modelled after the Neurosequential Model of Therapeutics (NMT) (Perry, 2006). NMT is a therapeutic ‘bottom-up’ approach that aims at treating lower brain networks (such as brainstem and limbic circuits) in order to develop structure and stability in these regions. From a neurodevelopmental perspective, it
is necessary that these regions properly develop in order to successfully access and treat higher cortical networks. As a result, the first 2-weeks of treatment are heavily focused on therapies that target development of lower level networks. Although TF-CBT is the primary component of the multimodal program, there is less time spent on TF-CBT in the first 2-week treatment period as opposed to the subsequent three 2-week treatment periods. Further to this, the distribution of each therapy is individualized based on each participants’ needs; that is, although there is a general framework for each treatment options, therapists have the capacity to individualize intervention schedules based on the participants’ needs and level of development.

The full program involves four 2-week intensive therapy periods over a 1 year period. However, in the current publication we examine the initial data available for the first 27 participants from their initial 2-week component only. We intend to analyze longer-term outcomes subsequently.

The BBR is located in a semi-rural area in Alberta, Canada and includes a number of communal lodges designed to accommodate the teens and give the ranch a “camp-like” feel. The BBR contains a number of advanced security features designed to provide safety for the adolescents; this includes a 24-hour security-guarded gate, a secured fence, and a confidential location. The BBR facility has been specifically designed to exceed all required safety and regulatory guidelines, is appropriately licensed, and is assessed regularly by all appropriate authorities.

During their stay at the BBR each teen was administered a daily comprehensive schedule that always included Trauma-Focused Cognitive Behavioural Therapy (TF-CBT). Daily and weekly meeting with therapists and staff ensured that there was consistency in treatment. The TF-CBT program involved the following four components: (1) skill-building phase that aimed at improving behavioural, affective, biological, and cognitive self-regulation; (2) careful and gradual exposure to the child’s trauma in a safe and controlled setting; (3) cognitive processing of the child’s personal traumatic incident as achieved through the development of a trauma narrative; (4) combined child-caregiver sessions and safety planning to develop treatment closure (Silverstone et al., 2016b). This approach has previously been shown to have lasting positive effects for CSA victims (Silverstone, Greenspan, Silverstone, Sawa, & Linder, 2015; Mannarino, Cohen, Deblinger, & Runyon, 2012).

The teens were also scheduled for a number of recreational activities that were designed to make the program more enjoyable, and to help build camaraderie and trust. These activities included: arts and crafts, structured play, animal therapy, cognitive-training, musical activities, and physical exercise. Each activity was properly supervised and carried out under a detailed plan linking them to therapy goals. Roughly six hours each day were allocated to structured activities, with the remainder of the day being reserved for free time and meals. As such, this program is considered an intensive multimodal intervention focused around TF-CBT.

Data Collection
As part of the treatment program, each participant was asked to fill out a survey at intake (baseline) and upon discharge at the end of the initial 2-week visit. Surveys ask basic demographic and environmental questions, followed by a several clinically validated self-report youth psychiatric outcome measures to measure (1) Adverse Childhood Experiences (ACEs), (2) Post-Traumatic Stress Disorder (PTSD), (3) Substance Abuse (4) Depression, (5) Anxiety, (6) Quality of Life, (7) Self-Esteem, and (8) Resilience. Anonymized data was then provided to the research team for evaluation. Questionnaire scores at baseline and discharge were compared to assess whether or not symptom improvement occurred in a variety of psychiatric domains.

Assessment Details

Demographics
Participants were asked their age, grade, gender, Indigenous status, and living situation in the first part of the assessment.

Nature of the Trauma
Details about the traumatic event, including: number of incidents (one or multiple), age at first incident, whether or not the victim knew the offender, and whether the offender was an adult or child/adolescent, was asked of the caregiver(s) of the teen. The teens themselves were also asked the same information only if, after revealing their trauma, they felt believed, supported, and that if their disclosure was acted on properly.

Outcome Measures
Adverse Childhood Experiences
History of Adverse Childhood Experiences (ACEs) was measured using the Center for Youth Wellness ACE-Questionnaire (CYW ACE-Q) (Oh et al., 2018). The CYW ACE-Q is not considered a validated diagnostic tool; however, it has been shown to be an effective tool for measuring exposure to adversity in adolescents (Harris & Renschler, 2015). The CYW ACE-Q is an 18-question survey that asks binary “yes/no” questions pertaining to a variety of common adverse events experienced by youth, including the standard 10 ACE items. Scores with an answer of “yes” are given 1 point and the total is summed. As such, higher scores indicate more ACEs experienced by the individual. A CYW ACE-Q score of >3 combined with symptomatology is generally considered an indicator for treatment referral (Harris & Renschler, 2015). The CYW ACE-Q was collected only at baseline.
PTSD
Post-Traumatic Stress Disorder symptoms were assessed using the Child PTSD Symptom Scale (CPSS), a validated self-report measure for this population (Serrano-Ibanez, Ruiz-Parrage, Esteve, Ramirez-Masetre, & Lopez-Martinez, 2018; Gillihan, Aderka, Conklin, Capaldi, & Foa, 2013). The CPSS contains 17-questions relating to the frequency of each PTSD symptom listed in the DSM-IV. Each question contains a Likert-scale ranging from 0 (not at all) to 3 (5 or more times a week). Potential total scores range from 0-51, and represent the following sub-categories: (0-10) Below Threshold, (11-15) Subclinical/Mild, (16-20) Mild, (21-25) Moderate, (26-30) Moderately Severe, (31-40) Severe, and (41-51) Extremely Severe, and a score of 15 or higher is considered an appropriate clinical cut-off for diagnosing PTSD. CPSS scores were collected at both baseline and discharge.

Substance Abuse
Substance Abuse was measured using the CRAFFT screening tool, named after the 6-questions it asks relating to the individual’s history of substance use (Car, Relax, Alone, Forget, Friends, Trouble). The CRAFFT is a validated self-report measure for adolescents (Knight, Sherritt, Shrier, Harris, & Chang, 2002). The CRAFFT consists of three introductory questions relating to alcohol, marijuana, and drug use. If that participant answers “yes” to any of the first three questions, they are asked to continue on to the 6 CRAFFT questions, and a score is recorded based on how many of these are answered as “yes.” If the participant answers “no” to all three introductory questions, a score of 0 is recorded. Scores range from 0-6, with a score of 2+ indicating a high risk for substance abuse. For our purposes, two extra questions were asked pertaining to the use of smoked and smokeless tobacco products. The CRAFFT was collected only at baseline for this portion of the treatment program.

Anxiety
Anxiety symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS), a validated self-report measure for this population (White, Leach, Sims, Atkinson, & Cottrell, 1999). The HADS is a 14-question scale relating to both anxiety and depression symptoms. For our study, only the anxiety subscale was included, as a separate questionnaire (described below) was used to measure depression symptoms. Questions were answered on a Likert-scale ranging from 0-3 with the answers changing depending on the question. Scores ranged from 0-21, with higher scores indicating a greater degree of anxiety. Scores of 0-7 are considered Normal, 8-10 Borderline Abnormal, and >10 Abnormal; as such, scores >7 indicate a clinical cut-off for an anxiety disorder diagnosis. HADS scores were collected at both baseline and discharge.

Depression
Depression symptoms were assessed using the Patient Health Questionnaire—adolescent version (PHQ-A), a validated self-report measure for this population (Richardson et al., 2010; Johnson, Harris, Spitzer, & Williams, 2002). The PHQ-A is a 9-question scale that is used to assess the severity and frequency of depressive symptoms for children aged 11-17. Each question is scored on a Likert-scale that ranges from 0 (not at all) to 3 (nearly every day). Scores range from 0-27, with higher scores indicating a greater degree of depression. Scores are broken down into the following sub-categories: (0-4) No Symptoms (5-9) Mild, (10-14) Moderate, (15-19) Moderately Severe, (20-27) Severe. A score of 8-11 is considered an appropriate cut-off for a major depressive disorder diagnosis (Manea, Gilbody, & McMillan, 2012). PHQ-A scores were collected at both baseline and discharge.

Question 9 on the PHQ-A asks the participant how often, over the last 2-weeks, they have had “thoughts that you would be better off dead or hurting yourself in some way.” If the participant answers anything greater than a score of 0 (not at all), then they are asked to answer two extra questions pertaining to suicidal ideation and attempt. The number of participants who answered these extra questions was recorded.

Quality of Life
Quality of life was measured using the KIDSCREEN-10, a validated self-report measure for this population (Ravnes-Sieberer et al., 2010). KIDSCREEN-10 consists of 10 questions inquiring about how often the individual has had positive experiences related to a high quality of life. Each question is scored on a Likert scale that ranges from 0 (not at all/never) to 4 (extremely/always). KIDSCREEN-10 also contains a bonus question which asks: “In general, how would you say your health is?” in which the answers range from 0 (poor) to 4 (excellent). Scores range from 0-44, with higher scores indicating a better quality of life. KIDSCREEN-10 scores were collected at both baseline and discharge.

Self-Esteem
Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES), a validated self-report measure for this population (Bagley & Mallick, 2012). The RSES consists of 10 questions that ask the individual how much they agree or disagree with a statement relating to how they view themselves. Each question is scored on a Likert-scale (0-3) that range from Strongly Agree to Strongly Disagree, depending on the question. Scoring is achieved through summation of results, and can range from 0-30, with higher scores indicating better self-esteem. A score between 15-25 is considered in the normal range, with scores below 15 suggesting low self-esteem. RSES scores were collected at both baseline and discharge.
Resilience

Resilience was measured using the Child & Youth Resilience Measure – adolescent version (CYRM-12), a validated self-report measure for this population (Govender, Cowden, Asanta, George, & Reardon, 2017; Liebenberg, Unger, & LeBlanc, 2013). The CYRM-12 consists of 12 questions that ask the participant to answer the extent to which they believe the statements describe them. Answers range from 1 (Not at all) to 4 (Quite a bit), and scores range from 12-48, with higher scores indicating more characteristics associated with resilience. CYRM-12 scores were collected at both baseline and discharge.

Statistical Analysis

In order to compare mean scores at baseline and discharge, as well as to compare changes in the scores of individual questions, 2-tailed paired t-test were carried out. For all statistical tests, a 95% confidence interval was used; that is, p < 0.05 was considered a statistically significant change in survey and question scores. However, to account for type I errors, the Benjamini-Hochberg method was used to correct for false discovery. Only results whose adjusted p-values that remained in the 95% confidence interval after this correction (i.e. p < 0.05) were considered statistically significant. Results show mean ± standard deviation.

Results

Demographics

Thirty-one (31) females aged 13-16 were admitted into the treatment program (Table 1). The average age at admission was 14.3 ± 0.97. Ten of the female participants (32.3%) identified as Indigenous Canadian. The majority lived with at least one parent (57.1%), while 6 (28.6%) lived with a non-relative. The vast majority of participants indicated that they felt safe in their home (90.3%), that had their own bedroom (87.1%), spent time with friends outside of school (83.9%), and had an adult they can trust (83.9%). Demographic data for the 27 participants who completed both baseline and discharge surveys is summarized in Table 1.

Nature of the Trauma

Table 2 summarizes information regarding the nature of the sexual abuse in this population. The mean age at first offence was 5.9 ± 3.5 years. Twenty-four (88.8%) participants reported multiple incidents of sexual abuse, and 92.6% (25) knew their offender prior to the abuse. Among the 27 participants, 85.2% indicated that their offender was an adult, while 9 (33.3%) reported abuse by another child or adolescent. Twenty-three (85.2%) participants felt supported after they revealed their trauma, while only 18 (66.7%) felt believed and 17 (63.0%) felt that it was acted on properly.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answered “Yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td>I spend time with friends outside of school</td>
<td>22 (81.5%)</td>
</tr>
<tr>
<td>I engage in activities outside of school (e.g. sports teams, clubs, organizations)</td>
<td>12 (44.4%)</td>
</tr>
<tr>
<td>I am involved in a community program (e.g. Big Brothers/Big Sisters)</td>
<td>3 (11.1%)</td>
</tr>
<tr>
<td>I have my own bedroom</td>
<td>25 (92.6%)</td>
</tr>
<tr>
<td>I feel safe at home</td>
<td>26 (96.3%)</td>
</tr>
<tr>
<td>I have an adult I can trust</td>
<td>23 (85.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nature of the trauma</th>
<th>n = 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age at first incident (years)</td>
<td>5.9 ± 3.5</td>
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<table>
<thead>
<tr>
<th>Number of incidents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>3 (11.2%)</td>
</tr>
<tr>
<td>Multiple</td>
<td>24 (88.8%)</td>
</tr>
<tr>
<td>Knew offender</td>
<td>25 (92.6%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Offender:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>23 (85.2%)</td>
</tr>
<tr>
<td>Adolescent/Child</td>
<td>9 (33.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When you first told somebody about your traumatic incident(s), did you feel:</th>
<th>Answered “yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Believed</td>
<td>18 (66.7%)</td>
</tr>
<tr>
<td>Supported</td>
<td>23 (85.2%)</td>
</tr>
<tr>
<td>Like it was acted on properly</td>
<td>17 (63.0%)</td>
</tr>
</tbody>
</table>
**Outcome Measures**

**Adverse Childhood Experiences**
The mean CYW ACE-Q score upon admission was 8.9 ± 3.3, with a range of 3-14 (Table 3). Since a history of CSA is a requisite for admission into the treatment program, 100% of the adolescents answered “yes” to question 6 which pertains to sexual abuse. Outside of CSA, the most frequently reported ACEs were: victims of bullying (74.1%), divorced parents (74.1%), household member with mental illness (74.1%), verbal abuse (70.4%), feeling of being unsupported/unloved (66.7%), physical abuse (63.0%), heard or witnessed neighbourhood violence (63.0%), and household substance abuse (63.0%).

**Overall Results**
Overall, all six questionnaires showed statistically significant “positive” improvements as it relates to the specific domain (Table 3 & Figure 1). The PHQ-A showed the largest change in mean scores (Δ% = -23.8%, p = 0.001), while the RSES, HADS, and CPSS all had statistically significant improvements of more than 20%.

**Substance Abuse**
The mean CRAFFT score at baseline was 1.76 ± 2.15, with 9 (33.3%) participants recording a score of 2 or more. Ten (37.0%) adolescents had previously smoked tobacco, while 22.2% (6) had used smokeless tobacco products.

**PTSD**
The mean CPSS score at baseline was in the upper Moderate sub-category (29.7 ± 10.6) while the mean score at discharge was in the Mild sub-category (23.6 ± 12.3). The number of teens who scored at or above the clinical threshold for a PTSD diagnosis decreased from 25 (92.6%) at baseline to 20 (74.0%) at discharge (Figure 2). Five of the 17 questions (29.4%) showed a statistically significant reduction in PTSD symptoms after 2-weeks. Question 9 and 10 showed the greatest change in score/frequency (Δ% = -36.0%, p = 0.007; Δ% = -39.6%, p = 0.008, respectively). Question 9 asks how often is the participant “Having much less interest doing things you used to do.” Question 10 asks how often the participant is “Not feeling close to the people around you.”

**Anxiety**
The mean HADS score at baseline was in the Abnormal sub-category (12.0 ± 4.3). The mean score at discharge was in the Borderline Abnormal sub-category (9.6 ± 4.8). The number of teens who scored at or above the clinical threshold for an anxiety disorder diagnosis decreased from 22 (81.5%) at baseline to 18 (66.6%) at discharge (Figure 2). Three of the 7 questions (42.9%) showed a statistically significant reduction in anxiety symptoms after 2-weeks. Questions 6 and 7 had the largest change in score (Δ% = -26.0%; p = 0.025; Δ% = -26.1%, p = 0.021, respectively). Question 6 states “I get sort of frightened feelings as if something awful is about to happen.” Question 7 states “I can sit at ease and feel relaxed.”

**Depression**
The mean PHQ-A score at baseline was in the Moderate sub-category (15.6 ± 6.6) with a range of 1-26; the mean score at discharge was in the Mild sub-category (11.9 ± 6.4). The number of teens who scored at or above the clinical threshold for a major depressive disorder diagnosis decreased from 21 (87.5%) at baseline to 16 (59.3%) at discharge (Figure 2). Three of the 9 questions (33.3%) showed statistically significant reductions in depression symptoms after 2 weeks. Questions 1 and 4 had the greatest reductions (Δ% = -44.2%; p = 0.0006; Δ% = -31.3%, p = 0.033, respectively). Question 1 asks the participant how often they’re “feeling down, depressed, or irritable”; Question 4 asks

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Domain</th>
<th>Range</th>
<th>μ (Baseline)</th>
<th>μ (2-weeks)</th>
<th>Δ</th>
<th>Δ%</th>
<th>p</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPSS</td>
<td>PTSD</td>
<td>0-51</td>
<td>29.7</td>
<td>23.6</td>
<td>-6.1</td>
<td>20.3%</td>
<td>0.002</td>
<td>0.009</td>
</tr>
<tr>
<td>HADS</td>
<td>Anxiety</td>
<td>0-21</td>
<td>12.0</td>
<td>9.6</td>
<td>-2.4</td>
<td>20.6%</td>
<td>0.006</td>
<td>0.014</td>
</tr>
<tr>
<td>PHQ-A</td>
<td>Depression</td>
<td>0-27</td>
<td>15.6</td>
<td>11.9</td>
<td>-3.7</td>
<td>23.8%</td>
<td>0.001</td>
<td>0.006</td>
</tr>
<tr>
<td>KIDSCREEN-10</td>
<td>Quality of Life</td>
<td>0-44</td>
<td>19.3</td>
<td>22.7</td>
<td>3.4</td>
<td>17.6%</td>
<td>0.022</td>
<td>0.031</td>
</tr>
<tr>
<td>RSES</td>
<td>Self-Esteem</td>
<td>0-40</td>
<td>10.4</td>
<td>12.7</td>
<td>2.3</td>
<td>22.9%</td>
<td>0.010</td>
<td>0.019</td>
</tr>
<tr>
<td>CYRM-12</td>
<td>Resiliency</td>
<td>12-48</td>
<td>29.0</td>
<td>31.1</td>
<td>2.1</td>
<td>6.9%</td>
<td>0.019</td>
<td>0.029</td>
</tr>
</tbody>
</table>

*p* = the adjusted p-value following a Benjamini-Hochberg FDR correction used to determine α-critical for each statistical t-test.

**Table 3. Mean change in self-report outcome measures after 2-week of an episodic complex multimodal treatment program for adolescent female survivors of child sexual abuse (CSA) (n=27).**

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A Novel 2-week Intensive Multimodal Treatment Program for Child Sexual Abuse (CSA) Survivors is Associated with Mental Health Benefits for Females aged 13-16
how often the participant has experienced “poor appetite, weight loss, or overeating.”

Question 9, which asks the participant whether, in the last 2-weeks, they have had “thoughts that you would be better off dead or hurting yourself in some way?” showed a 47.5% decrease in scores ($p = 0.001$). Since the number of individuals who answered “not at all” to thoughts of suicide on Question 9 increased from 9 (33.3%) to 12 (44.4%), this suggested there was also a meaningful reduction in suicidal thinking ($p = 0.04$). Similarly, at baseline, 11 (61%) of those who had scored at least 1 on Question 9 had contemplated suicide in the previous month and 77.8% (14) admitted to having attempted suicide at least once in their lifetime. However, by 2-weeks only 40% reported having suicidal ideation ($p = 0.01$).

**Quality of Life**

The mean KIDSCREEN-10 score at baseline was 19.3 ± 6.7. The mean score at discharge was 22.7 ± 7.3. Five of the 11 (45.5%) of the questions showed statistically significant improvements over 2-weeks of treatment. Question 4 showed the largest change ($\Delta% = 62.5\%, p = 0.022$), which asks the individual “Have you felt lonely?”

**Self-Esteem**

The mean RSES score at baseline was 10.4 ± 6.0; the mean score at discharge was 12.7 ± 6.3. Both means fall within the Low Self-Esteem sub-category, but the number of participants who were above the Normal Self-Esteem threshold (>15) increased from 6 to 10. Three of the 10 questions (30.0%) showed statistically significant improvements after 2-weeks of treatment. Question 1, which states “On the whole I am satisfied with myself” showed the greatest improvement in score ($\Delta% = 52.2\%, p = 0.013$)

**Resiliency**

The mean CYRM-12 score at baseline was 29.0 ± 7.5; the mean score at discharge was 31.2 +/- 6.5. Only Question 2 showed a statistically significant improvement ($\Delta% = 32.6\%, p= 0.011$). Question 2 states “I know where to go in the community to get help.”
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Discussion

Child sexual abuse (CSA) is a form of early-life trauma that can lead to psychiatric impairment across a number of domains (Bucker et al., 2012; Chen et al., 2010; Maniglio, 2009; Gibb, Chelminski, & Zimmerman, 2006) Young females are particularly susceptible to CSA, with at least 20% of Canadian females experiencing one significant incident of sexual abuse before adulthood (MacMillain et al., 2013; Stoltenbourg et al., 2011). As such, the need for an intensive and multifaceted treatment program, specifically tailored for this population, is essential.

The preliminary findings from this study suggest that 2-weeks of an intensive multimodal treatment program specifically designed for adolescent female CSA survivors can induce positive changes across a variety of mental health domains. The results show that after 2-weeks of the treatment program, there was a noticeable reduction in negative symptoms (PTSD, depression, anxiety, and suicidal ideation) and an increase in positive domains (quality of life, self-esteem, resiliency). Further to this, all six outcomes showed statistically significant improvement from initial admission to discharge. While it is premature to draw any conclusions based on this preliminary data, these initial findings support the potential efficacy of the regimen in treating this population.

As noted in the methods, the program is designed around the Neurosequential Model of Therapeutics (NMT) (Perry, 2006), which identifies the need for lower brain functional and developmental stability in order to make the participant more amenable to higher-level therapy, such as TF-CBT—the primary treatment component of the entire program. The NMT approach assists therapists in determining the vulnerabilities and strengths of the participant which can help to tailor the regimen to each individual’s needs (Ludy-Dobson & Perry, 2010). It’s possible that the combination of this ‘bottom-up’ approach to treatment with the variability afforded to each individual was primarily responsible for the positive results. However, it is also likely that the stability and structure of the program—coupled with a potential respite from toxic home environment—was the primary cause of the observed changes.

One of the most pertinent reasons why these initial results are so important, however, is our finding that over 40% of our sample had expressed suicidal ideation in the previous...
month, and nearly 3/4 had actually attempted suicide in their lifetime. Significantly, there was nearly a 50% drop in such suicidal thoughts after the 2-week program. These findings support previous findings suggesting that these adolescents are at particularly high risk for self-harm (Maniglia, 2011; Noll, Horowitz, Bonanno, Trickett, & Putnam, 2003) as such, improvements in the short term may have important prospective safety ramifications.

Secondary to the improvements we witnessed, we postulated that, upon admission, our population would have elevated scores for each outcome measure, as CSA survivors are at a higher risk for mental illness. The mean number of Adverse Childhood Experiences (ACEs) reported by this population was nearly triple the recommended indicator for treatment referral (Harris & Renschler, 2015). A majority of the participants had not only experienced CSA but had also been bullied, verbally and physically abused, experienced parental divorce, and lived with a mentally ill family member. At baseline, mean scores for PTSD were in the Moderately Severe, scores for anxiety were in the Abnormal range, and scores for depression were in Moderate range. Significantly, over 80% of our population met the clinical cut-off for comorbid PTSD, anxiety, and depression at intake. Mean self-esteem baseline scores were also considered to be Low. This highlights the propensity for CSA survivors to experience a wide-range of negative mental health symptoms that can only be combated by a comprehensive treatment program centered around treating the trauma itself.

Limitations

There were limitations to this research which may reduce the generalizability of the current preliminary findings. Firstly, and importantly, this was not a controlled study. The program is designed and run by an independent charitable organization and was not designed as a clinical research study. The lack of a control group prevents the reported research from being able to definitively determine the potential effectiveness of the intervention. To address this, it is proposed that a future research program be considered which will include an appropriate control group. Secondly, the size of the sample (n=27) and brief follow-up period (2-weeks) may also limit the generalizability of the current findings. It is certainly possible that in larger samples different results may have been found, or that over longer-periods any initial changes may revert to the mean. To address this, both larger sample groups and longer-term follow up (for up to 12-months) are planned. Thirdly, there was no formal independent assessment, with data being collected entirely from self-report questionnaires, it is conceivable that such data may not reflect what would be found in independent interviews by appropriately trained individuals. This could potentially be addressed by detailed interviews with smaller sub-groups to determine how accurate the self-reported data may be. Fourthly, there were multiple different types of interventions involved in the present program, so any particularly beneficial program elements cannot be definitively identified. Fifthly, individuals were in a novel and highly supportive location with peers who had experienced similar abuse and it is conceivable that non-specific benefits from these aspects of the program may have contributed to the clinical improvements seen. It is, therefore, not possible—without appropriate control groups—to determine what specific aspects of the entire intensive multimodal intervention may have been most important in the changes seen. To address this issue, future research is intended to try and identify the key components of the overall program. Lastly, it is important to be aware that it is likely that different individuals may have responded to different components of this multimodal program, and future research will be needed to parse out which aspects are most important for the largest number of individuals.

Conclusion and Future Research

In conclusion, the current preliminary results indicate that an initial 2-week intensive multimodal treatment program designed for adolescent female CSA survivors may potentially improve several different mental health domains, including PTSD, anxiety, depression, and suicidality. However, given the limitations from these preliminary findings, longer-term controlled studies are recommended before determining the longer-term effectiveness and generalizability of any improvements. The intensive nature of the program (four 2-week visits over the course of 1-year) inherently requires thorough assessment of the program’s efficacy in treating this population. Future research should compare the effects of such intensive programs with other, less intensive options such as outpatient TF-CBT or online DBT. Further analysis of the full 1-year program may help with some of these issues, particularly in terms of sustainability of these initial improvements suggested by the results to date. Ideally, an intensive multi-modal treatment approach, such as the one carried out at the Be Brave Ranch, may also help identify the key elements for a best-practice treatment program for CSA survivors.

Acknowledgements / Conflicts of Interest

The authors have no financial relationships to disclose.

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