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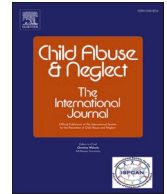
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Child sexual abuse survivors: Differential complex multimodal treatment outcomes for pre-COVID and COVID era cohorts

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ABSTRACT

Background: Child sexual abuse (CSA) is a form of early-life trauma that affects youth worldwide. In the midst of the current COVID-19 pandemic, it is imperative to investigate the potential impact of added stress on already vulnerable populations.

Objective: The aim of this study was to evaluate the effectiveness of a multimodal treatment program on mental health outcomes for youth CSA survivors aged 8–17. Secondary to this, we explored the potential impact of the COVID-19 on treatment outcomes.

Participants and setting: Participants of this study were children and youth aged 8–17 who were engaged in a complex multimodal treatment program specifically designed for youth CSA survivors.

Methods: Participants were asked to complete self-report surveys at baseline and at the end of two subsequent treatment rounds. Surveys consisted of measures pertaining to: (1) PTSD, (2) depression, (3) anxiety, (4) quality of life, and (5) self-esteem.

Results: Median scores improved for all groups at all timepoints for all five domains. For the pre-Covid participants, the largest improvements in the child program were reported in depression (36.6 %, $p = 0.05$); in the adolescent program anxiety showed the largest improvement (–35.7 %, $p = 0.006$). Improvements were generally maintained or increased at the end of round two. In almost every domain, the improvements of the pre-COVID group were greater than those of the COVID-I group.

Conclusions: A complex multimodal treatment program specifically designed for youth CSA survivors has the capacity to improve a number of relevant determinants of mental health and well-being. The COVID-19 pandemic may have retraumatized participants, resulting in treatment resistance.

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1. Introduction

Psychological trauma occurs when an individual endures (or perceives) a stressful event—or series of events—that overwhelms their capacity to mentally cope and adapt. Traumatic experiences have been shown to induce long-term negative psychological changes in survivors; this is particularly true for survivors of childhood trauma (Spates et al., 2007). Defining psychological trauma remains an ongoing issue, as individuals differ not only in their traumatic experiences, but also in how they respond to those stressors (Hughes et al., 2017; Weathers & Keane, 2007). Childhood maltreatment and early-life trauma fall under the umbrella of Adverse Childhood Experiences (ACE). In adults, a history of ACE has been associated with deleterious long-term outcomes, including increased likelihood of developing chronic and infectious diseases, decreased vocational and occupational success, engagement in risky behaviors such as unprotected sex or substance abuse, and increased susceptibility to post-traumatic stress disorder (PTSD), depression, anxiety, self-harm, suicidal ideation and suicide attempts (Herzog & Schmahl, 2018; Middlebrooks & Audage, 2008).

Child sexual abuse (CSA) is a common ACE that impacts children and adolescents worldwide. There is no currently established overall prevalence for CSA, but global estimates in developed nations approximate that over 8 % of males and 16 % of females will experience at least one significant episode of CSA prior to adulthood (Barth et al., 2013; Chiu et al., 2013; Finkelhor et al., 2008; Martin & Silverstone, 2013; Pereda et al., 2009). In Canada, rates have been estimated as high as 10 % in males and 20 % in females (MacMillan et al., 2013; Stoltenborgh et al., 2011). Notably, variability in reporting, access to services, and rates of disclosure suggest that the prevalence of CSA is likely underestimated and may be as high as 30 % in females and 23 % in males (Kelley and Karsna, 2017; Finkelhor et al., 2014). Variability in reporting may also be related to heterogeneity in the definition of CSA, which can include a diverse set of sexually-related behaviors such as: (1) unwanted exposure to pornography, genitalia, or sexual acts; (2) child exploitation or grooming; (3) oral-genital contact; (4) attempted intercourse, and (5) penetration (Macdonald et al., 2016; Putnam, 2003; Williams, 2019).

CSA has been associated with a number of psychological challenges for survivors; among these the most common are PTSD, depression, anxiety, and behavioural problems (Bucker et al., 2012; Chen et al., 2010; Maniglio, 2009; Robert et al., 2004). CSA survivors are more likely to experience trauma-related mental health issues as compared to individuals with other types of early-life trauma (Ferguson et al., 2008; Tremblay et al., 2000). Several non-pharmacological treatment options appear to be effective in treating CSA survivors, but the effectiveness of these modalities in improving desired outcomes has only been minimally assessed. Cognitive Behavioural Therapy (CBT), particularly trauma-focused CBT (TF-CBT), may be the most impactful monotherapy for CSA-related PTSD, depression, and anxiety (Macdonald et al., 2016; Hetzel-Riggin et al., 2007). Other modalities, including group therapy (Duffany and Panos, 2008; Tourigny et al., 2005), animal-assisted therapy (Signal et al., 2017; Dietz et al., 2012), play therapy (Slade & Warne, 2016), eye movement desensitization and reprocessing (EMDR) (Shapiro, 2014; Wesselmann et al., 2018), art therapy (Waller, 2006), and recreational therapy (D'Andrea et al., 2013) may also result in positive outcomes. Evidence suggests that combination (i.e. multimodal) therapy (e.g., TF-CBT + play therapy + supportive therapy) is superior to any particular monotherapy in treating this population (Sanchez-Meca et al., 2011).

A major challenge to developing a “gold-standard” for treating CSA is the diversity of experiences between individuals and the way in which this heterogeneity of trauma history manifests psychologically. In a trauma-focused approach, a successful outcome depends on a survivor's capacity to create a mental construction of the trauma and ultimately develop a trauma narrative (Ruf & Schauer, 2012). Creation of a trauma narrative is generally mediated through gradual exposure methods which aim to ease the survivor towards confronting and reprocessing traumatic memories. To accomplish this, individuals under treatment must have the capacity to emotionally regulate and mentally process their incident(s) (Macdonald et al., 2016). The Neurosequential Model of Therapeutics (NMT), as outlined by Perry (2006), suggests a “bottom-up” approach, in which anatomically lower-level brain networks (i.e. autonomic and limbic circuits) are treated first. This allows the survivor to develop the emotional regulation required to effectively access the psychological pathways targeted through TF-CBT. Preliminary evidence suggests that combining the NMT with a multimodal treatment regimen may have the capacity to improve psychological outcomes and well-being in adolescent female CSA survivors (Reeson et al., 2020).

At present, a major factor relevant to the treatment of CSA survivors is the psychological impact of the ongoing COVID-19 pandemic. Pandemics induce immediate instability in daily-life and have been shown in the past to have psychological impacts on individuals who have lived through them (Chawla et al., 2021; Cheng & Wong, 2005; Chua et al., 2004). Many experts have expressed concern about the potential consequences the COVID-19 pandemic has on children and adolescents; this includes an increase in reports of child physical and sexual abuse (Bradbury-Jones & Isham, 2020; Kuehn, 2020), as well as higher incidences of child sex trafficking, child pornography, and online sexual exploitation—especially as youth are spending more time online and on social media (Augusti et al., 2021; Ramaswamy & Seshadri, 2020; Sserwanja et al., 2020; Tener et al., 2021). For children, the closure of schools leads to separation from friends and peer groups; this can cause increased stress, loneliness, depression, and feelings of isolation (Ghosh et al., 2020; Matthews et al., 2016; Wang et al., 2020), and has been associated to declines in physical and mental health (Brazendale et al., 2017). Adolescents appear to be particularly impacted by the effects of the COVID-19 pandemic (Zhou et al., 2020). A systematic review assessing mental health outcomes in youth impacted by the COVID-19 pandemic found the highest levels of depression and anxiety in adolescent populations, particularly in females aged 12–18 (Nearchou et al., 2020). As such, it is essential for trauma-focused treatment programs to acknowledge the potential compounding impact lockdowns, school closures, and the stress of a pandemic are having on already vulnerable populations.

The primary aim of this study is to assess the effectiveness of a novel complex multimodal treatment program specifically aimed at treating youth CSA survivors. By analyzing changes in self-report outcome measures in a number of domains related to mental health and well-being, this study intends to provide a preliminary assessment of this program at treating both children and adolescents with a

history of CSA. Further to this, we aimed to evaluate the impact the COVID-19 pandemic has had on this population by comparing reported outcomes between participants who completed their treatment before and after the onset of the COVID-19 pandemic.

2. Methods

2.1. Ethics approval

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

2.2. Study design

The primary objective of this analysis was to assess the effectiveness of a novel treatment program for CSA survivors in improving mental health and well-being. Secondly, we aimed to assess the impact the COVID-19 pandemic had on any treatment effects. The analysis was conducted on data collected as part of routine care at a facility dedicated to specifically treat child and adolescent survivors of CSA. As standard procedure, self-report surveys are administered to the participants at admission and discharge from each round of treatment. This study includes data collected between January 2019 and October 2021. Data collected from the surveys was anonymized and sent to a third-party server to be encoded and subsequently sent to researchers for a secondary independent analysis of the collected information.

2.3. Treatment program

Treatment took place at a community care facility known as the Little Warriors “Be Brave Ranch” (BBR). The BBR is a charitable, not-for-profit organization designed to specifically treat children and adolescent survivors of CSA. The BBR consists of two programs: (1) The child program – designed for CSA survivors aged 8–12; (2) The adolescent program – designed for CSA survivors aged 13–17. Both programs consist of four intensive treatment rounds that are spread out over the course of one year. All treatment rounds are 12-days in duration, with the exception of the first round of child program which consists of a 28-day stay.

The BBR is located in a semi-rural area outside of Edmonton, Canada. The facility consists of a number of communal lodges to accommodate the children and provide a more naturalistic and “camp-like” feel. There are a number of advanced security features designed to provide safety for both children and staff, including a 24-h security-guarded gate, a secured fence, security cameras, and a confidential location. The facility has been intentionally designed to exceed all required safety and regulatory guidelines, is appropriately licensed, and is assessed regularly by all appropriate authorities.

2.4. Participants

Admission into the program is based on an initial screening interview conducted by staff at the BBR. Participants for both the child and adolescent program were required to meet the following inclusion criteria:

- Appropriate age for the specific program
- Psychologically minded and able to benefit from therapy
- IQ > 80 as determined by previous assessments
- Medically stable and compliant with medications
- Child has disclosed abuse to at least one adult/caregiver
- Family/caregiver is identified and involved
- Completion of a readiness assessment

2.5. Program design

The intensive multimodal treatment program includes weekly exposure to a suite of therapeutic approach, comprised of the following techniques:

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

The allocation of these therapies follows a general schedule that differs based on which round of treatment the participants are attending. The program is specifically designed to allow for some individual variation in the program in order to focus particular therapies for selected individuals who may benefit more from a regimen that emphasizes one specific treatment modality over another. The exact set of treatments was determined by the therapy team following regular (usually daily) on-site meetings. The therapeutic framework for the program is modelled after the Neurosequential Model of Therapeutics (NMT) (Perry, 2006). The first round of treatment (28-days for the children, 12-days for the adolescents) has a heavier emphasis on those treatment options that specifically target the development of lower level networks such as play, music, animal-assisted, recreational/sport, and art therapy. Upon admission into treatment, staff at the BBR complete sensory profiles with each child, adolescent, and/or caregiver to obtain information about their level of sensory processing. The BBR clinical framework supports a bottom-up approach, involving the child as well as their caregiver(s) to further support co-regulation. Related to this, each participant goes through “sensory stations” throughout the course of treatment. These stations accommodate one-to-one feedback from each child or adolescent regarding their experiences and are an opportunity to determine potential emotional triggers—with ongoing discussion related to trauma-focused cognitive behavioural therapy principles—as well as educate the participants on useful grounding strategies (e.g., use of a weighted blankets, white noise and music, aromatherapies, self-massage, etc.). The early part of the program emphasizes somatosensory therapies such as animal-assisted therapies, yoga and mindful movement, art and expressive therapies, music therapy, breathing exercises, EMDR, and Hakomi interventions. All of these interventions are conducted by specialized trained therapists. Additionally, the program utilizes traditional healing practices and cultural practices (e.g., smudging, drumming, sweat-lodge participation, story-telling, etc.) that promote inclusion of individuals with varying backgrounds. It should be noted while the entire program is considered trauma-informed, the weight of TF-CBT within the treatment regimen expands over the course of treatment and is thus under-represented in the first half of the program as compared to the later rounds of treatment. Earlier treatment rounds emphasize emotional regulation/sensory somatic work and therapeutic milieu, while later treatment rounds emphasize one-on-one interventions and trauma-focused interventions.

During their stay at the BBR, each participant is administered a daily comprehensive schedule that always included some level of TF-CBT. This approach involves the following four components: (1) skill-building phase aimed at improving cognitive, affective, behavioural and biological self-regulation; (2) intentional gradual exposure to the child's trauma in a safe, careful, and controlled manner; (3) cognitive processing of the child's personal traumatic incident as achieved through the construction of a trauma narrative; (4) combined child-caregiver sessions and safety planning to develop closure, a combined approach which has preliminarily been shown to have lasting positive effects for this population (Mannarino et al., 2012). Apart from direct therapy, the participants are also scheduled for a number of recreational activities that were designed to make the program more exciting and help to build social relationships and trust. Each activity is properly supervised and carried out under a detailed plan linking them to therapy goals. Roughly six hours each day are allocated to structured activities, with the remainder of the day being reserved for free time and meals.

2.6. Outcome measures

2.6.1. PTSD

PTSD levels were assessed using the Child PTSD Symptom Scale (CPSS), a validated self-report outcome measure for this population (Serrano-Ibanez et al., 2018; Gillihan et al., 2013). The CPSS contains 17-questions relating to the frequency of each PTSD symptom listed in the *DSM-V*. Total scores range from 0 to 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*. A score of 15 or higher is considered an appropriate clinical cut-off for diagnosing PTSD.

2.6.2. Depression & Anxiety

For the child participants, depression and anxiety were measured using the 25-question Revised Child Anxiety and Depression Scale (RCADS-25), which is a shortened version of the more extensive 47-question RCADS. The RCADS-25 is a validated self-report measure for depression and anxiety in children aged 8–12 (Klaufus et al., 2020; Piqueras et al., 2017). The full questionnaire is broken down into two subscales for depression and anxiety. The anxiety subscale includes 15 questions and scores can range from 0 to 45; the depression subscale includes 10 questions and can range from 0 to 30.

For the adolescent participants, 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). 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. Scores range from 0 to 27, with higher scores indicating a greater degree of depression. A score of 8–11 is considered an appropriate cut-off for a major depressive disorder diagnosis (Meanea et al., 2012). Anxiety symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS), a validated self-report measure for adolescents (White et al., 1999). The HADS is a 14-question scale relating to both anxiety and depression symptoms. For our study, only the anxiety subscale was included. Scores range from 0 to 21, with higher scores indicating a greater degree of anxiety. Scores of 0–7 are considered *Normal*, 8–10 *Borderline Abnormal*, and > 10 *Abnormal*.

2.6.3. Quality of life

Quality of life was measured using the KIDSCREEN-10, a validated self-report measure designed for children and adolescents (Ravens-Sieberer et al., 2010). KIDSCREEN-10 consists of 10 questions relating to how often the individual has positive experiences that are indicators of quality of life. Overall scores range from 0 to 44, with higher scores indicating better quality of life.

2.6.4. Self-esteem

Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSES), a validated self-report measure for children (Bagley & Mallick, 2001). 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. A total score is achieved through summation of results, and can range from 0 to 30, with higher scores indicating better self-esteem. A score between 15 and 25 is considered in the *normal* range, with scores below 15 suggesting low self-esteem.

2.6.5. COVID questionnaire

In order to assess the impact of the COVID-19 Pandemic on those participants who began their treatment after its onset, a 6-question COVID Questionnaire was included in the baseline surveys for all participants. Each question was scored on a Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The questions were worded so that stronger agreement (thus higher scores) indicated a greater impact of the pandemic.

2.6.6. COVID questionnaire example

The following questions relate to the COVID-19 Pandemic. Please indicate to what extent you agree or disagree with each statement:

1. The COVID-19 pandemic has increased my overall stress and anxiety
2. Social distancing has made me feel disconnected from my friends and/or family
3. I spend a lot of time worrying about the COVID-19 pandemic
4. Self-isolation has increased the amount of conflict with my family
5. My fears about COVID-19 have interfered with my plans for the future
6. The COVID-19 pandemic has increased the amount of time I spend on electronic devices

2.7. Data collection

Self-report surveys were administered electronically via tablets at initial admission (baseline) and again at discharge of each treatment round. The present study includes data collected from the first two rounds of treatment for both programs. All data is collected and anonymized by a third party server and then provided to the research team for further evaluation. For many of the outcome measures, the answer options are given on a Likert-scale. To make this less complicated for the children, a slider-bar was implemented into the survey to add a visual effect that intended to help the child accurately convey their answers and increase their engagement. Surveys ask basic demographic and environmental questions (e.g., involvement with peer groups, community programs, etc.), followed by several clinically validated self-report child psychiatric outcome measures to assess (1) PTSD, (2) depression, (3) anxiety, (4) quality of life, and (5) self-esteem. Questionnaire scores at each timepoint were compared to assess whether or not symptom improvement occurred in a variety of domains for mental health domains.

As a result of the COVID-19 pandemic, the BBR was forced to close between March and May 2020. For study purposes, participants data was differentiated based on whether treatment had completed prior to, or after the onset of the COVID-19 pandemic. Pre-COVID participants were those who completed their treatment rounds prior to March 2020; COVID-impacted (COVID-I) participants were those who completed their treatment rounds following May 2020. Those participants who began their first treatment following this break were given a COVID questionnaire which contained six questions asking the participant how much the COVID-19 pandemic had impact certain aspects of their lives.

2.8. Statistical analysis

To assess the change in median questionnaire scores over time, non-parametric Mann-Whitney *U* Tests were carried out between baseline and the end of round one for those who completed the first treatment round, as well as between baseline and the end of round two for those who completed the second treatment round. To determine statistical differences in the response distribution of the COVID-19 questionnaire between the two programs, a non-parametric Kolmogorov-Smirnov test for distribution was used. For all statistical tests, a critical value of $p = 0.05$ was used. Due to the number of comparisons in this study, a false discovery correction method—the Benjamini-Hochberg method—was used to appropriately manage Type I errors. Only results whose adjusted p-value remained below the critical alpha level were considered statistically significant.

3. Results

3.1. Participants

In total, 151 participants completed at least one round of treatment and were included in this study. Eighty-two (54.3 %) attended the child program and 69 (45.7 %) attended the Adolescent Program. Participant demographics summarized in [Table 1](#).

3.2. Child program

The mean age of the 82 participants in the child program was 10.7 (1.3) years (range 8–12) at baseline. The average age of the pre-COVID cohorts was slightly older (10.9 (1.3) years) than that of the COVID-I cohorts (10.4 (1.3) years). The majority of participants were in grade five (20.7 %) or six (31.7 %). Fifty-seven (69.5 %) of the participants were biologically female and 25 (30.5 %) male. In terms of gender identity, 46 (56.1 %) identified as female, 22 (26.8 %) identified as male, and 14 (17.1 %) identified as non-binary. Over a third of participants (36.6 %) identified as an Indigenous Canadian.

3.3. Adolescent program

The mean age of the 69 participants in the adolescent program was 14.3 (1.5) years (range 13–17) at baseline. The average age of the pre-COVID cohorts was slightly younger (14.2 (0.9) years) than that of the COVID-I cohorts (14.3 (1.5) years). The majority of participants were in grade nine (33.3 %) or ten (30.4 %). Sixty-five (94.2 %) of the participants were biologically female and four (5.8 %) were male. In terms of gender identity, 56 (81.2 %) identified as female, four (5.8 %) identified as male, and nine (13.0 %) identified as non-binary. Over two-fifths of participants (40.6 %) identified as an Indigenous Canadian/American.

3.4. Environmental questionnaire

3.4.1. Child program

Results from the Little Warriors Environmental Questionnaire are summarized in Table 2. In total, the questions receiving the highest level of agreement were “feeling safe in my home” (89.0 %) and “having an adult I can trust” (89.0 %). The fewest number of participants reported engaging in activities outside of school (e.g. sports teams, organizations, clubs, etc.) (68.3 %), and interacting with friends outside of school (72.0 %). A smaller proportion of the pre-COVID participants reported engaging in extra-curricular activities than those in the COVID-I cohorts (81.6 % and 56.8 %, respectively). When asked about their traumatic event(s), sixty-two (75.6 %) participants reported feeling believed upon disclosing their CSA; sixty (73.2 %) reported feeling supported, and sixty-

Table 1

Demographic information for participants in a multimodal treatment program designed for youth child sexual abuse survivors aged 8–16. Pre-Covid participants underwent their treatment round(s) prior to March 2020; Covid impacted participants underwent their treatment round(s) following May 2020.

Child program		Pre-covid (n = 38)	Covid impacted (n = 44)	Total (n = 82)
Mean age (years)		10.9 ± 1.3	10.4 ± 1.3	10.7 ± 1.3
Grade				
	3	4 (10.5 %)	4 (9.1 %)	8 (9.8 %)
	4	6 (15.8 %)	7 (15.9 %)	13 (15.9 %)
	5	5 (13.2 %)	12 (27.3 %)	17 (20.7 %)
	6	13 (34.2 %)	13 (29.5 %)	26 (31.7 %)
	7	6 (15.8 %)	7 (15.9 %)	13 (15.9 %)
	8	4 (10.5 %)	1 (2.3 %)	5 (6.1 %)
Sex				
	M	16 (42.1 %)	9 (20.5 %)	25 (30.5 %)
	F	22 (57.9 %)	35 (79.5 %)	57 (69.5 %)
Gender identity				
	M	15 (39.5 %)	7 (15.9 %)	22 (26.8 %)
	F	20 (52.6 %)	26 (59.1 %)	46 (56.1 %)
	Non-binary	3 (7.9 %)	11 (25.0 %)	14 (17.1 %)
Identify as indigenous		14 (36.8 %)	16 (36.4 %)	30 (36.6 %)
Adolescent program		Pre-covid (n = 27)	Covid impacted (n = 42)	Total (n = 69)
Mean age (years)		14.2 ± 0.9	14.3 ± 1.5	14.3 ± 1.5
Grade				
	7	1 (3.7 %)	5 (11.9 %)	6 (8.7 %)
	8	5 (18.5 %)	6 (14.3 %)	11 (15.9 %)
	9	10 (37.0 %)	13 (31.0 %)	23 (33.3 %)
	10	10 (37.0 %)	11 (26.2 %)	21 (30.4 %)
	11	1 (3.7 %)	7 (16.7 %)	8 (11.6 %)
Sex				
	M	0 (0 %)	4 (9.5 %)	4 (5.8 %)
	F	27 (100 %)	38 (90.5 %)	65 (94.2 %)
Gender identity				
	M	0 (0 %)	4 (9.5 %)	4 (5.8 %)
	F	24 (88.9 %)	32 (76.2 %)	56 (81.2 %)
	Non-binary	3 (11.1 %)	6 (14.3 %)	9 (13.0 %)
Identify as indigenous		9 (33.3 %)	19 (45.2 %)	28 (40.6 %)

three (76.8 %) felt that it had been acted on properly. A larger proportion of the pre-COVID cohorts reported feeling supported as compared to the COVID-I cohorts (86.8 % and 61.4 %, respectively).

3.4.2. Adolescent program

Of the 69 adolescent participants, the questions receiving the highest agreement rate were “feeling safe in my home” (94.2 %) and “having my own bedroom” (92.7 %). The fewest number of participants reported “engaging in activities outside of school” (50.8 %), and interacting with friends outside of school (78.3 %). A smaller proportion of participants reported “socializing with friends outside of school” in the COVID-I cohorts (64.3 % vs. 81.5 % pre-COVID) as well as “engaging in extra-curricular activities” (54.8 % vs. 69.3 pre-COVID). When asked about their traumatic event(s), sixty-two (75.6 %) reported feeling believed upon disclosing their CSA; sixty (73.2 %) reported feeling supported, and sixty-three (76.8 %) felt that it had been acted on properly. A larger proportion of the pre-COVID cohorts reported feeling supported as compared to the COVID-I cohorts (86.8 % and 61.4 %, respectively).

3.5. Survey results

Changes in median questionnaire scores are summarized in Table 3. Each program was divided into 4 groups based on: (1) Treatment Round (baseline to end of round one vs. baseline to the end of round two); (2) COVID-impacted (those participants who completed their treatment rounds prior to- vs. following the onset of the COVID-19 pandemic. Reductions in median PTSD, depression, and anxiety measures were considered improvements; increases in median self-esteem and quality of life were considered improvements. Overall, participants reported positive improvements in every single measured domain at the end of both treatment rounds; this was true for both pre-COVID and COVID-I cohorts.

3.6. Child program

3.6.1. Overall survey results

Improvements in median scores are summarized in Table 3 and Fig. 1. The largest change reported after the first treatment round in the child program was in depression (−36.6 %, $p = 0.05$); a change in median score of 20.5 at baseline to 13 at the end of treatment round one. Improvement in median depression scores was also the largest in round two, but was not statistically significant (−34.1 %, $p = 0.11$). For treatment round one, statistically significant changes in the pre-COVID cohorts were reported for PTSD (−26.0 %, $p = 0.036$), depression (−36.6 %, $p = 0.05$), and anxiety (−26.2 %, $p = 0.001$); for the COVID-I cohorts, significant changes in round one were reported for PTSD (−22.0 %, $p = 0.001$) and depression (−21.6 %, $p = 0.005$). For treatment round two, significant changes in the pre-COVID cohorts were reported in the PTSD (−20.4 %, $p = 0.048$); for the COVID cohorts, significant changes in round two were reported in the depression (−27.3 %, $p = 0.048$).

In comparison to the COVID-I cohorts, the improvements reported in the pre-COVID cohorts were greater in almost every

Table 2

Number of participants who answered “Yes” to questions in the Environmental Questionnaire designed for youth child sexual abuse survivors aged 8–12 undergoing a multimodal treatment program. Participant answers were recorded at initial admission (baseline). Pre-Covid participants underwent their treatment round(s) prior to March 2020; Covid impacted participants underwent their treatment round(s) following May 2020.

Environmental questionnaire child participants	Pre-covid (n = 38)	Covid impacted (n = 44)	Total (n = 82)
Do you socialize with friends outside of school?	28 (73.7 %)	31 (70.5 %)	59 (72.0 %)
Do you do any activities outside of school (e.g. sports teams, clubs, etc.)?	31 (81.6 %)	25 (56.8 %)	56 (68.3 %)
Do you have your own bedroom?	30 (78.9 %)	39 (88.6 %)	69 (84.1 %)
Do you feel safe in your home?	33 (86.8 %)	40 (90.9 %)	73 (89.0 %)
Do you have an adult you can trust?	34 (89.5 %)	39 (88.6 %)	73 (89.0 %)
After disclosing your trauma			
Did you feel believed?	30 (78.9 %)	32 (72.3 %)	62 (75.6 %)
Did you feel supported?	33 (86.8 %)	27 (61.4 %)	60 (73.2 %)
Did you feel like it was acted on properly?	30 (78.9 %)	33 (75.0 %)	63 (76.8 %)
Environmental questionnaire adolescent participants	Pre-covid (n = 27)	Covid impacted (n = 42)	Total (n = 69)
Do you hang out with friends outside of school?	22 (81.5 %)	27 (64.3 %)	54 (78.3 %)
Do you do any activities outside of school (e.g. sports teams, clubs, etc.)?	17 (69.3 %)	23 (54.8 %)	35 (50.8 %)
Do you have your own bedroom?	25 (92.6 %)	39 (92.9 %)	54 (92.7 %)
Do you feel safe in your home?	25 (92.6 %)	40 (95.2 %)	65 (94.2 %)
Do you have an adult you can trust?	23 (85.2 %)	37 (88.1 %)	60 (87.0 %)
After disclosing your trauma			
Did you feel believed?	18 (66.7 %)	23 (54.8 %)	41 (54.9 %)
Did you feel supported?	23 (85.2 %)	28 (66.7 %)	51 (73.9 %)
Did you feel like it was acted on properly?	16 (59.3 %)	16 (38.1 %)	32 (46.4 %)

Table 3

Results from self-report questionnaires answered by youth child sexual abuse survivors (aged 8–16) engaged in a multimodal treatment program for their abuse. Median scores are reported from initial admission (B), end of treatment round one (T1), and end of treatment round two (T2). Participant answers were recorded at initial admission (baseline). Pre-Covid participants underwent their treatment round(s) prior to March 2020; Covid impacted participants underwent their treatment round(s) following May 2020.^a

Child program	Round 1 Results (n = 82)				
COVID	Domain	Median (B)	Median (T2)	Δ%	p-Value
Pre COVID-19 (n = 38)	PTSD	25	18.5	−26.0 %	0.036
	Depression	20.5	13	−36.6 %	0.05
	Anxiety	21	15.5	−26.2 %	0.001
	Quality of life	24	26	8.3 %	0.093
	Self-esteem	15.5	18	16.1 %	0.15
COVID impacted (n = 44)	PTSD	29.5	23	−22.0 %	0.001
	Depression	18.5	14.5	−21.6 %	0.005
	Anxiety	23	17.5	−23.9 %	0.093
	Quality of life	25	26	4.0 %	0.29
	Self-esteem	15.5	17	9.7 %	0.17

Child program	Rounds 2 Results (n = 50)				
COVID	Domain	Median (B)	Median (T2)	Δ%	p-Value
Pre COVID-19 (n = 24)	PTSD	27	21.5	−20.4 %	0.05
	Depression	20.5	13.5	−34.1 %	0.11
	Anxiety	24	18.5	−22.9 %	0.091
	Quality of life	23	26	13.0 %	0.32
	Self-esteem	16	16.5	3.1 %	0.88
COVID impacted (n = 26)	PTSD	27	23	−14.8 %	0.22
	Depression	16.5	12	−27.3 %	0.048
	Anxiety	18	13.5	−25.0 %	0.14
	Quality of life	27	28.5	5.6 %	0.066
	Self-esteem	17	19	11.8 %	0.33

Adolescent program	Round 1 Results (n = 69)				
COVID	Domain	Median (B)	Median (T2)	Δ%	p-Value
Pre COVID-19 (n = 27)	PTSD	32	22	−31.3 %	< 0.001
	Depression	16	13	−18.8 %	0.001
	Anxiety	14	9	−35.7 %	0.006
	Quality of life	19	22	15.8 %	0.014
	Self-esteem	10	12	20.0 %	0.005
COVID impacted (n = 42)	PTSD	30	25.5	−15.0 %	0.02
	Depression	12.5	11	−12.0 %	0.11
	Anxiety	14	10	−28.6 %	0.007
	Quality of life	19.5	20	2.6 %	0.08
	Self-esteem	12	14	16.7 %	0.02

Adolescent program	Round 2 Results (n = 47)				
COVID	Domain	Median (B)	Median (T2)	Δ%	p-Value
Pre COVID-19 (n = 23)	PTSD	32	23	−28.1 %	0.007
	Depression	14	10	−28.6 %	0.026
	Anxiety	18	11	−38.9 %	0.003
	Quality of life	19	21	10.5 %	0.057
	Self-esteem	9	10	11.1 %	0.11
COVID impacted (n = 24)	PTSD	29.5	22	−25.4 %	0.041
	Depression	12	10	−16.7 %	0.093
	Anxiety	14	10	−28.6 %	0.32
	Quality of life	20.5	22	7.3 %	0.40
	Self-esteem	14.5	15	3.3 %	0.65

^a Statistically significant p-values (<0.05) noted in bold.

domain—this is true for both rounds of treatment. The only reported improvements that were greater in the COVID-I cohorts were: (1) Anxiety changes in treatment round 2 (pre-COVID: 22.9 % p = 0.091; COVID-I: 25.0 %, p = 0.142) and (2) self-esteem changes in treatment round 2 (pre-COVID: 3.1 %, p = 0.88; COVID-I: 11.8 %, p = 0.332).

3.6.2. PTSD

In both the pre-COVID and COVID-I cohorts, there was a reduction in median CPSS scores for both treatment rounds. The median baseline CPSS score was higher for the COVID-I cohorts (29.5 – *moderately severe*) as compared to the pre-COVID cohorts (25 – *moderate*). The largest improvement was reported for pre-COVID round one (–26.0 %, $p = 0.036$). Statistically significant changes were also found for pre-COVID round two (–20.4 %, $p = 0.05$), and COVID-I round one (–22.0 %, $p = 0.001$).

3.6.3. Depression

In both the pre-COVID and COVID-I cohorts, median RCADS-D scores were reduced at both timepoints. The median baseline RCADS-D score was higher in the pre-COVID cohorts (20.5 and 18.5, respectively). Statistically significant improvements were reported at pre-COVID round one (–36.6 %, $p = 0.05$), COVID I round one (–21.6 %, $p = 0.005$), and COVID-I round two (–27.3 %, $p = 0.048$). Improvements in depression scores were higher for the pre-COVID cohorts at both timepoints.

3.6.4. Anxiety

Median RCADS-A improved at all timepoints for both groups. The median baseline RCADS-A score was higher for the COVID-I cohorts than for pre-COVID (23 and 21, respectively). Statistically significant reductions were only reported at pre-COVID round one (–26.2 %, $p = 0.001$). Improvements in anxiety scores were higher in the pre-COVID cohorts for round one, but were greater for the COVID-I cohorts in round two.

3.6.5. Quality of life

Improvements in median KIDSCREEN-10 scores were reported at all time points; however, none of the changes were statistically significant. The largest improvement was reported at pre-COVID round two (13.0 %, $p = 0.322$). Improvements in KIDSCREEN scores were greater at both time points for the pre-COVID cohorts.

3.6.6. Self-esteem

Improvements in median RSES scores were reported at all timepoints; however, none of these changes were statistically significant. The largest improvement was reported by the pre-COVID cohorts in round one (16.1 %, $p = 0.15$). Changes in RSES scores were greater for the pre-COVID group at the end of round one but were higher in the COVID-I cohorts at the end of round two.

3.7. Adolescent program results

3.7.1. Overall survey results

Improvements in median scores are summarized in Table 3 and Fig. 2. The largest improvement at the end of round was reported depression for the pre-COVID participants (–35.7 %, $p = 0.006$). The largest change reported after the second round of treatment was reported anxiety for the pre-COVID participants (–38.9 %, $p = 0.003$). For treatment round one, statistically significant changes in the

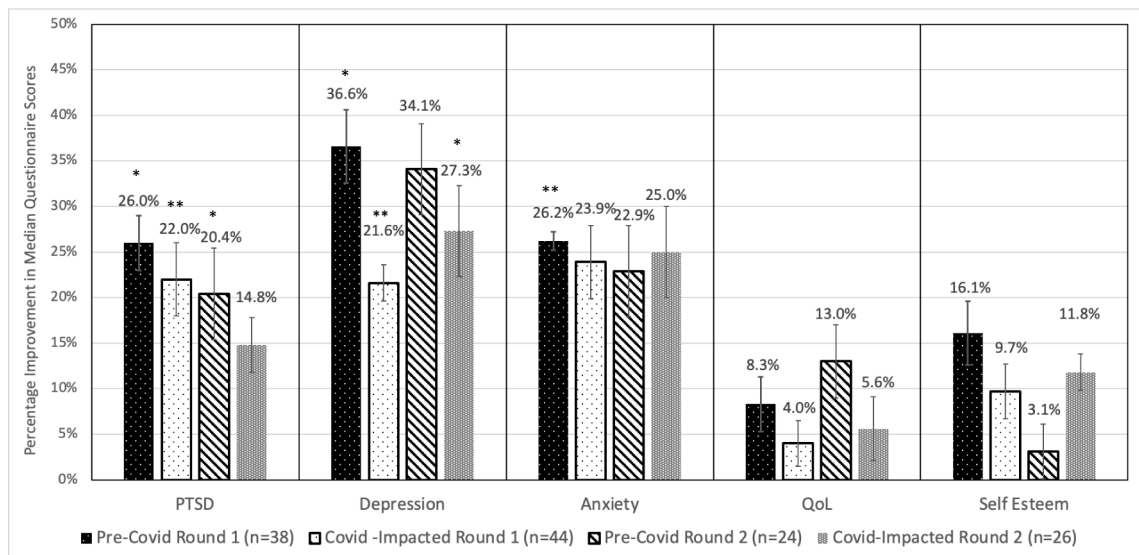


Fig. 1. Percent improvements in median self-report questionnaire scores for child survivors of child sexual abuse (aged 8–12) engaged in a multimodal treatment program. Pre-Covid participants underwent their treatment round(s) prior to March 2020; Covid impacted participants underwent their treatment round(s) following May 2020. Round 1 results represent the change in median score from baseline to the end of the first round of treatment; Round 2 results represent the change in median scores from baseline to the end of the second round of treatment.

* denotes $p < 0.05$; ** denotes $p < 0.01$.

pre-COVID cohorts were reported in all five domains: PTSD (−31.3 %, $p < 0.001$), depression (−18.8 %, $p = 0.001$), anxiety (−35.7 %, $p = 0.006$), quality of life (15.8 %, $p = 0.014$), self-esteem (20 %, $p = 0.005$). For the COVID-I cohorts, statistically significant changes were reported in round one for the PTSD (−15.0 %, $p = 0.02$), anxiety (−28.6 %, $p = 0.007$), and self-esteem (16.7 %, $p = 0.02$). For treatment round two, statistically significant changes in the pre-COVID cohorts were reported in the PTSD (−28.1 %, $p = 0.007$), depression (−28.6 %, $p = 0.026$), and anxiety (−38.9 %, $p = 0.003$); for the COVID-I cohorts, significant changes in round two were reported in the PTSD (−25.4 %, $p = 0.041$).

In comparison to the COVID-I cohorts, the improvements reported in the pre-COVID cohorts were greater for all domains at each timepoint.

3.7.2. PTSD

For both groups there was a reduction in median CPSS scores at both treatment rounds. The median baseline CPSS score was higher for the pre-COVID participants (32 – *severe*) than the COVID-I participants (29.5 – *moderately severe*). The largest improvement was reported for pre-COVID round one (−31.3 %, $p < 0.001$). Statistically significant improvements were also reported for pre-COVID round two (−28.1 %, $p = 0.007$), COVID-I round one (−15.0 %, $p = 0.02$), and COVID-I round two (−25.4 %, $p = 0.041$).

3.7.3. Depression

In both groups median PHQ-A scores improved at both timepoints. The median baseline PHQ-A score was higher in the pre-COVID cohorts than the COVID-I cohorts (16 and 12.5, respectively). Statistically significant reductions were reported for pre-COVID round one (−18.8 %, $p = 0.001$) and pre-COVID round two (−28.6 %, $p = 0.026$). Improvements in the COVID-I cohorts were not statistically significant, and were lower than the pre-COVID cohorts at both timepoints.

3.7.4. Anxiety

In both groups median HADS scores improved at both timepoints. The median baseline HADS scores were the same for the pre-COVID and COVID-I cohorts (14 – *Abnormal/High*). Statistically significant reductions were reported for pre-COVID round one (−35.7 %, $p = 0.006$), pre-COVID round two (−38.9 %, $p = 0.003$), and COVID-I round one (−28.6 %, $p = 0.007$). Improvements in anxiety scores were higher for the pre-COVID cohorts at both timepoints.

3.7.5. Quality of life

Improvements in median KIDSCREEN-10 scores were reported at all time points. Statistically significant improvement were only reported by the pre-COVID cohorts at round one (15.8 %, $p = 0.014$). Changes in KIDSCREEN scores were greater at both time points for the pre-COVID cohorts.

3.7.6. Self-esteem

Improvements in median RSES scores were reported at all timepoints. Statistically significant changes were reported for pre-COVID

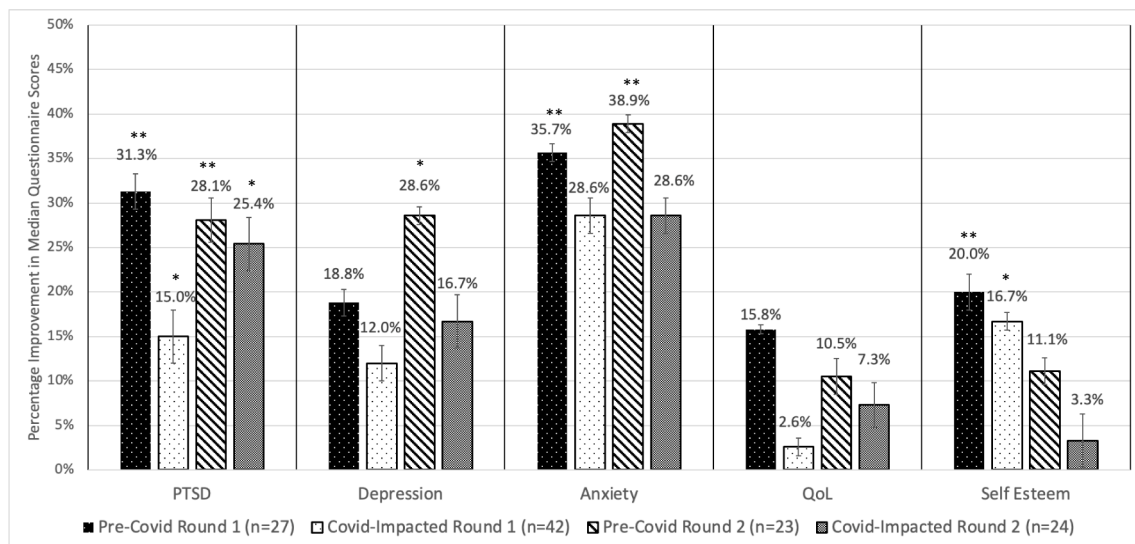


Fig. 2. Percent improvements in median self-report questionnaire scores for adolescent survivors of child sexual abuse (aged 13–16) engaged in a multimodal treatment program for their abuse. Pre-Covid participants underwent their treatment round(s) prior to March 2020; Covid impacted participants underwent their treatment round(s) following May 2020. Round 1 results represent the change in median score from baseline to the end of the first round of treatment; Round 2 results represent the change in median scores from baseline to the end of the second round of treatment. * denotes $p < 0.05$; ** denotes $p < 0.01$.

round one (20.0 %, $p = 0.005$) and COVID-I round one (16.7 %, $p = 0.02$). Changes in RSES scores were greater for the pre-COVID group at both timepoints.

3.8. COVID-19 questionnaire

The results of the COVID-19 Questionnaire are summarized in Figs. 3 & 4. In the child program, the highest level of agreement was reported for question 2: “Social distancing has made me feel disconnected from friends and/or family”; 18 (40.9 %) strongly agreed with this statement and 7 (15.9 %) agreed. The highest level of disagreement was reported for question 3: “I spend a lot of time worrying about the COVID-19 pandemic”; 18 (40.9 %) strongly disagreed with this statement and 15 (34.1 %) disagreed. In the teen program, the highest level of agreement was reported for question 2 (11 (26.2 %) strongly agreed, 16 (38.9 %) agreed) and question 6: “The COVID-19 pandemic has increased the amount of time I spend on electronic devices”; 15 (35.7 %) strongly agreed and 11 (26.2 %) agreed. The highest level of disagreement was reported for question 3 (7 (16.7 %) strongly disagree, 12 (28.6 %) disagree).

For every question, the median adolescent participant response was either equal to or greater than those of the child program, indicating a higher reported level of impact from the COVID-19 pandemic. Statistically significant differences in response distribution were only found for questions 3 ($p = 0.044$).

4. Discussion

The purpose of this study was to independently assess the potential effectiveness of an evidence-based complex multimodal treatment program specifically designed to treat youth Child Sexual Abuse (CSA) survivors aged 8–17. The results supported our hypothesis that both children and adolescents would report improvements in PTSD, depression, anxiety, quality of life, and self-esteem after the initial round of treatment. The results further suggest that these initial benefits are sustained following a second round of treatment. Although preliminary, the findings of this analysis support the effectiveness of a complex multimodal treatment program for this population, irrespective of pandemic experience. Secondly, the results of this study suggest that the onset and consequences of the COVID-19 pandemic may interfere with the impact of treatment, as evidenced by a reduction in reported outcome improvements in participants who began their treatment following the onset of the pandemic.

4.1. Impact of treatment program on CSA

At all timepoints measured in this study, self-reported symptoms of PTSD showed significant and sustained improvements. Considering over a third of CSA survivors experience some form of PTSD in their lifetime (Berline & Elliot, 2002), a sustainable reduction in PTSD and other trauma-related symptoms is an essential marker of treatment effectiveness. However, it is important to emphasize that the effects of CSA are heterogenous and depend on the intrinsic characteristics of the victim, the identity of the offender and their relationship with the victim, as well as the severity, frequency, and duration of the abuse (Kundakovic & Champagne, 2015; Nemeroff, 2004; Putnam, 2003). As such, treatment programs specifically designed for young CSA survivors are more likely to provide benefit if it employs a variety of therapeutic tools and strategies. The evidence for this can only be assessed through the implementation

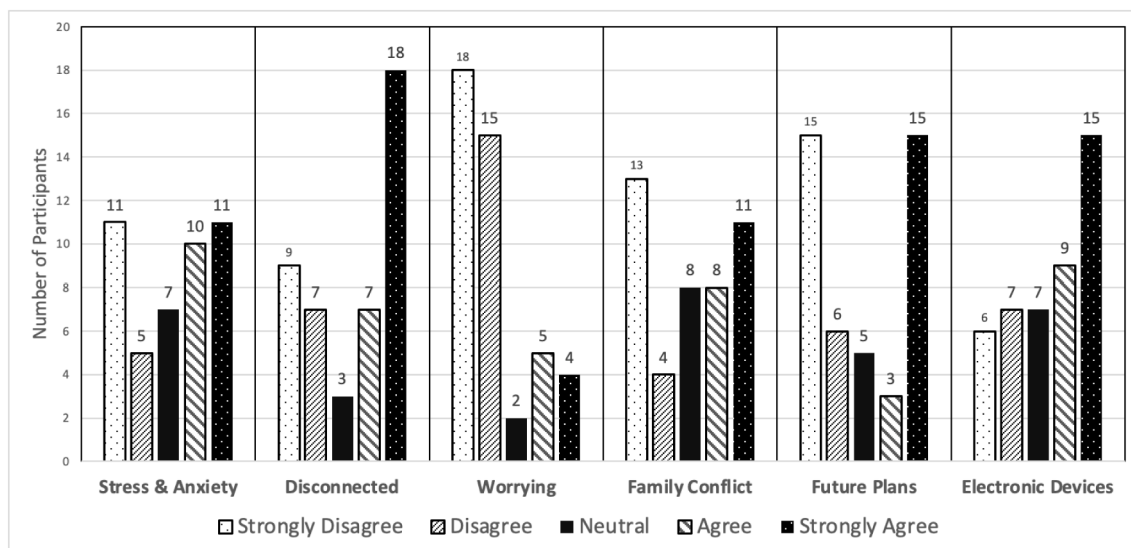


Fig. 3. Results from the COVID-19 Questionnaire for child survivors of child sexual abuse (aged 8–12) engaged in a multimodal treatment program for their abuse. The results show the level of agreement or disagreement with each statement. Higher levels of agreement equate to a greater self-reported impact of the COVID-19 pandemic.

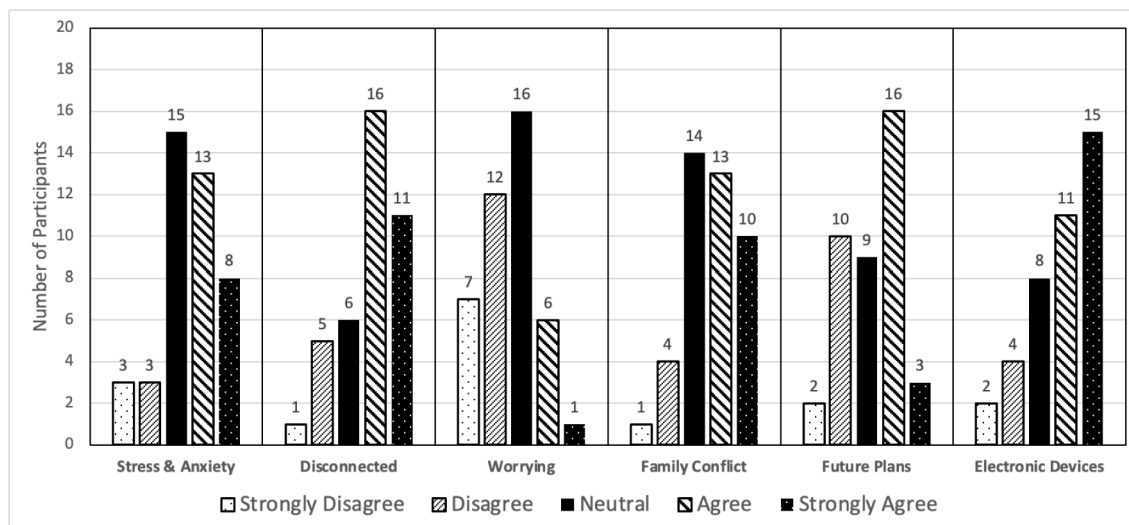


Fig. 4. Results from the COVID-19 Questionnaire for adolescent survivors of child sexual abuse (aged 13–16) engaged in a multimodal treatment program for their abuse. The results show the level of agreement or disagreement with each statement. Higher levels of agreement equate to a greater self-reported impact of the COVID-19 pandemic.

of validated outcome measures that assess a variety of relevant domains. At all timepoints, children and adolescents consistently reported improvements in depression, anxiety, quality of life and self-esteem, which helps to strengthen the evidence of positive treatment effect for this population.

Considering these results represent the first half of the program in which there is a greater emphasis on somatosensory therapies rather than intensive trauma-focused therapies—as outlined by the NMT—the improvements noted may be more attributable to the modalities employed during these treatment rounds. The findings of this study revealed reported anxiety and depression symptoms to show the greatest improvements in both the child and adolescent groups. Many of the somatosensory therapies utilized at the BBR, including art therapy (Lyshak-Stelzer et al., 2007), dance/movement therapy (Jeong et al., 2005), yoga and mindfulness (Spinazzola et al., 2011), and EMDR (Hoogsteder et al., 2021) have been shown to reduce stress and anxiety in traumatized youth. In the context of CSA, this is particularly important as youth with histories of complex trauma tend to manifest their trauma on a sensory level; as such, outcomes of treatment are highly dependent on the abused individual developing a sense of security and comfortability (Fraser et al., 2017). This may suggest that the early treatment rounds are effectively reducing emotional dysregulation and potentially increasing each participant's capacity to respond well to metacognitive therapies such as TF-CBT. Further investigation into the effects of the entire treatment program is needed to validate this claim.

There is evidence that TF-CBT may be the best treatment option for traumatized youth (Macdonald et al., 2016; Hetzel-Riggin et al., 2007); however, the results of the study suggest that TF-CBT is most effective when supplemented with a variety of treatment options. Considering TF-CBT itself already contains multiple components tailored to improving emotional regulation and coping skills (Cohen et al., 2018), augmenting TF-CBT with somatosensory interventions may complement the impacts of this therapeutic approach. Because the successful development of a trauma narrative is so essential to trauma-focused therapy, those individuals who have the capacity to emotionally regulate are more likely to benefit from this type of therapy (Ruf & Schauer, 2012). Schore (2001) suggested that the development of a trauma narrative through TF-CBT is mediated by a reduction in right hemispheric activity in the brain, which is often overactive in individuals with emotional/limbic dysregulation. The development of a trauma-narrative through gradual exposure may activate left hemispheric linguistic centers, effectively reducing right hemispheric activity while offering the victim the opportunity to verbalize their traumatic memories and fears.

4.2. The impact of the COVID-19 pandemic

A secondary finding of this study was the impact of the COVID-19 pandemic on the effectiveness of the treatment program. In comparison to the participants that completed their treatment round(s) prior to the onset of the pandemic, children and adolescents that began treatment after the onset of the pandemic consistently reported lower levels of improvement. Collective traumas, such as natural disasters or pandemics, have the capacity to retraumatize already vulnerable populations (Pazderka et al., 2021), and may explain some of the differences in treatment outcomes observed. Social distancing, lockdowns, school closures, and a public health crisis has the potential to increase individual stress levels (Ghosh et al., 2020; Wang et al., 2020) which could result in treatment resistance. In both programs, there was a noticeable reduction in reported improvements in PTSD, depression, and anxiety, although the differences in anxiety for the child program were less pronounced. PTSD, depression, and anxiety are linked to stress, which is primarily mediated through the Hypothalamic-Pituitary-Adrenal (HPA) axis. Early-life stress has been linked to heightened HPA axis hyperactivity (Juruea et al., 2020), as well as epigenetic modifications of the genes responsible for HPA axis regulation (Anacker et al.,

2014). As such, the compounding impact of a pandemic on youth already susceptible to stress dysregulation may be responsible for the reduction in reported improvements; this may be particularly true for adolescents (Nearchou et al., 2020). The impact of the pandemic may also be inducing added stress on the caregivers of these children and adolescents, which is crucial considering how parental stress has been associated with behavioural problems in children (Sanner and Neece, 2017; Mackler et al., n.d.). A recent review on the impact of the COVID-19 pandemic revealed that caregivers with higher stress loads are more susceptible to increased alcohol and drug consumption, putting further strain on the family unit (Schmidt et al., 2021). The COVID-19 pandemic had a clear impact on the effect of these modalities at reducing internalized symptoms such as depression and anxiety. In both the child and adolescent programs, reported improvement in PTSD, depression, and anxiety were lower in the COVID-impacted groups. This was particularly true following the first round of treatment in which somatosensory interventions are specifically emphasized. The combination of these findings suggests that the early emphasis on somatosensory therapy in this setting is appropriate and effective; however, contextual elements, such as the unique experiences associated with a global pandemic, are necessary to consider when determining treatment approach and outcomes.

The findings of the COVID Questionnaire suggest that adolescents attending the program have felt a larger impact of the pandemic as compared to the younger participants. A majority of both the children and adolescents reported feeling more disconnected from friends and family and spending more time on electronic devices. The rising influence of social media has been associated with an increase in mood disorders in youth, particularly adolescent females (Kelly et al., 2019); this may partially explain some of the treatment resistant effects seen in the COVID-I groups. Disconnection from peer groups also reduces interactions with social support networks, which have been shown to be significant mediators in the management of mental health and quality of life (Alsubaie et al., 2019). Adolescent participants were also more likely to report increased family conflict, which may account for some of the differences in outcomes for the two programs. It is possible that “stay-at-home” orders, which have increased interaction time between parents and their children, has been beneficial for younger children; inversely, more interaction between adolescents and parents—coupled with decreased socialization with peer groups—may be increasing family conflict and further adding to their overall stress in older participants. Another consideration is the role that emotional attachment and reflective functioning plays in the health of the caregiver-child dyad. A caregiver's capacity to empathize with their child and mentalize the child's feelings and thoughts is highly predictive of parent and child mental health (Camoirano, 2017); this is particularly consequential in the context of childhood abuse and trauma (Berthelot et al., 2015; Garon-Bissonnette et al., 2022). Strategies aimed at improving reflective functioning and attachment have the capacity to reduce parental stress (Nijssens et al., 2018), which may subsequently improve the health of the caregiver-child dyad. Mentalization and reflective functioning appears to be particularly important in gender diverse children and adolescents (Caldarera et al., 2022), which is significant considering roughly 15 % of the participants in this study identified with a non-binary gender. The BBR specifically addresses caregiver-child relations through attachment-based work that is highly encouraged. To facilitate this, staff work with caregivers to provide specific psychoeducational underpinnings based upon attachment-based approaches (Siegal, 2015), such as an online psychoeducational program for caregivers. This is further reinforced through Clinical Transitional Support Workers who work through psychoeducation online and in-person supports with identified “homework” for caregivers to work with their child/adolescent on. Further, the BBR is in the process of implementing a family-based program aimed at strengthening the dyad in participants who have previously engaged with the program.

Finally, the majority of participants reported experiencing higher than normal levels of anxiety and stress, which is in line with reports from other studies surveying the impact of the COVID-19 pandemic on youth (Meherali et al., 2021; Villani et al., 2021). Interestingly, the majority of children and adolescents disagreed (or were neutral) on the proposition that they spent a lot of time worrying about the pandemic. Considering the noticeable effect the pandemic had on reported improvements from treatment, this finding could suggest that the stressful impact of the pandemic is unconsciously experienced and may manifest in other forms, such as intrafamilial conflict.

4.3. Cultural considerations

One notable finding of this analysis was that over a third of the children and adolescents seen in the program identified as Indigenous Canadian. Preliminary research investigating the prevalence of CSA in Canadian Indigenous populations have reported rates of 20–25 %, and there is evidence suggesting Indigenous youth are at a higher risk for CSA than their non-Indigenous counterparts (Collin-Vezina & Dion, 2009). Further to this, Indigenous CSA survivors are more likely to be younger at the time of their abuse and are more likely to experience serious forms of CSA (Du Mont et al., 2017). Considering Indigenous youth are already at an elevated risk for PTSD, depression, substance abuse, and suicide (Nelson & Wilson, 2017), it is imperative that an effective treatment program for these populations exists. The BBR utilizes cultural linkages and attempts to infuse Indigenous values and beliefs into the program to further amplify the positive effects of the program and make these individuals feel comfortable. This includes traditional sweat lodge ceremonies, smudging, traditional teaching, and involvement of local Elders.

4.4. Limitations & future considerations

There were a number of limitations to this analysis that may reduce the generalizability of the findings. Most significantly, this was a secondary analysis of data collected by an independent organization, it was not a clinical research study, and there was no comparison group. Without a comparison group, it is difficult to confidently attribute the reported improvements in mental health and well-being solely to the treatment program. We propose that future research should include a treatment-as-usual or waitlist control comparison group in order to fully elucidate the effects specifically attributed to treatment. Further to this, it is possible that some of

the positive effects were a result of individuals staying in a highly supportive location with individuals who have had similar experiences, and that the benefits seen were non-specific benefits from the environment rather than the program therapies specifically. However, since the creating a hospitable environment is an intentional characteristic of the program, any benefits from this part of treatment may be difficult to tease out. It should be noted that these results only encapsulate half of the entire treatment program, which consists of four treatment rounds over the course of 12-months. The purpose of this study was to provide evidence-based justification for further program assessment. Secondly, because data was collected entirely from self-report questionnaires, it is possible that the results are not entirely accurate in reflecting the true degree of symptom severity. Using clinician-rated measures or qualitative interviews to supplement these self-report measures could ensure more accurate data collection and correct for outliers or errors. Thirdly, complex trauma, such as CSA, inherently involves vast heterogeneity in the severity and extent of the abuse which may have influenced the impact of the treatment program on each individual. Details of individual experiences were not collected as doing so had the potential to trigger harmful memories in participants who may not be ready to fully disclose the nature of their traumatic experience(s). However, if this information is available in other settings it should be included in future research to differentiate between variable CSA experiences. Fourthly, differences in outcome improvements between groups were not statistically compared. The data analysis strategy relied on multiple group comparisons, and the researchers determined that increasing the number of comparisons would reduce the validity of the statistical analysis. As the primary objective of this research was to assess the effectiveness of the program, and not to determine the differences between COVID-impacted and non-impacted groups, a narrative approach was considered appropriate, with the caveat that these findings are only meant to guide future research. Finally, considering Indigenous youth are more likely to be victims of CSA (Du Mont et al., 2017) and the resultant mental health problems associated with early-life trauma (Nelson & Wilson, 2017), it is essential that future research focus on treatment options appropriate for vulnerable populations such as these. Further, the impact of intergenerational trauma, particularly from the atrocities of the Canadian Indian Residential School System, has made this population more vulnerable to the impacts of early-life stress and trauma (Bombay et al., 2014). As a significant proportion of children treated who identified as Indigenous Canadian, it would be useful for further research to carry out a sub-analysis on this population in order to determine whether or not Indigenous children receive greater or lesser benefit from the program than their non-Indigenous peers.

5. Conclusion

The results of this study provide preliminary evidence that a multimodal treatment program specifically designed for youth CSA survivors has the capacity to provide widespread improvements in essential determinants of mental health and well-being. In both the child and adolescent programs, participants reported improvements in every domain under investigation after their first round of treatment. For those who underwent two treatment rounds, these positive improvements were maintained. However, considering this assessment was limited to the first half of the program, it's difficult to determine whether the outcomes reported were a result of acute treatment effects and whether these improvements are sustainable long-term. Considering the program is structured under an NMT framework, the positive improvements reported are likely more a result of somatosensory therapies (e.g., dance/movement, music, art, yoga, breathing exercises, and mindfulness training) than metacognitive approaches such as TF-CBT. Further assessment of the entire program will help support the findings of this study and elucidate specific treatment effects. Second, the findings of this study revealed a decrease in reported improvements for those participants who began their treatment after the onset of the COVID-19 pandemic. This may suggest that the consequences of a global pandemic, including lockdowns, school closures, social distancing, and fear of illness, may exacerbate the effects of trauma and/or reduce the benefit of the therapy program. As such, the potential compounding impact that a global pandemic may have on traumatized individuals should be considered when treating this population.

Data availability

The authors do not have permission to share data.

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