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Development of a Brief Primary Care Intervention for PTSD in Adolescents

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Author Note

Some findings from this data have been previously presented as posters at the 2020 Medical Student Research Symposium at Boston University, School of Medicine and DREAM IPC Conference.

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1 Abstract

2 **Objective:** Our study aims to adapt an evidence-based, brief intervention for use in an urban safety-net
3 adolescent primary care center with an existing integrated behavioral health team who have not
4 previously treated post-traumatic stress disorder (PTSD) explicitly in the clinic.

5 **Background:** PTSD is routinely undertreated in adolescent primary care due in part to a lack of
6 evidence-based interventions for PTSD that can be feasibly delivered in primary care. Sustainable PTSD
7 interventions in adolescent medicine clinics must overcome patient, provider, and system-level barriers.

8 **Methods:** The Brief Relaxation, Education And Trauma Healing (BREATHE) was selected for
9 adaptation based on a literature review of evidence-based target interventions. Purposeful sampling was
10 used to recruit nine adolescent patients, two parents, and eight clinic staff (N=19) for individual
11 qualitative interviews focused on feasibility of implementation of a PTSD intervention delivered in an
12 adolescent medicine primary care clinic that serves diverse patients with high trauma exposure. Audio
13 recordings from these interviews were transcribed and analyzed using inductive and directed a priori
14 approaches related to the central research questions.

15 **Results:** Participants provided feedback on the format and content of the BREATHE intervention to
16 adapt the existing treatment to be feasible and sustainable in a primary care setting. Overall, participants
17 thought the intervention was helpful and feasible and provided specific feedback for adaptation.

18 **Conclusion:** This study developed the Primary Care Intervention for PTSD (PCIP) as a resource for
19 improving PTSD care for adolescents in a primary care setting. Further studies will evaluate PCIP
20 efficacy on PTSD symptomology.

21 **KEY WORDS:** PTSD, adolescents, primary care, integrated behavioral health, pediatrics

22 **Implications for Impact:** This study adapted a 3-session intervention for Post-traumatic Stress
23 Disorder (PTSD) to be used in an adolescent primary care clinic. The PCIP is a resource that
24 primary care clinics can implement into their practice as a feasible intervention for patients with
25 PTSD.

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Introduction

Traumatic experiences are common among adolescents in the United States. Almost 80% of U.S. adolescents have experienced a potentially traumatic event (Finkelhor et al., 2009). By age 18, approximately 7% of U.S. adolescents will have had post-traumatic stress disorder (PTSD) (Merikangas et al., 2010). Prevalence estimates for adolescents from urban safety net hospitals (defined as hospitals with high rates of patients coping with poverty and community violence) are even higher (Berton & Stabb, 1996; Lipschitz et al., 2000). Furthermore, PTSD is routinely undiagnosed and untreated in adolescent primary care suggesting that a large proportion of adolescent primary care patients are living with unaddressed PTSD (Gerson & Rappaport, 2013). For those patients who are diagnosed with PTSD in a primary care setting, standard treatment typically involves referral to sub-specialty mental health services, but follow-through on mental health referrals is very low for adolescents (Banh et al., 2008). In comparison, pediatric patients prefer accessing mental health treatment in primary care due to ease of access and reduced stigma when compared to accessing subspecialty or stand-alone mental health care (Straus & Sarvet, 2014; Thomas & Holzer, 2006).

In recent years, there has been a growing trend towards embedding behavioral health providers (e.g., psychologists, social workers) into adult and pediatric primary care settings, a service delivery model sometimes referred to as integrated or collaborative care (SAMHSA-HRSA Center for Integrated Health Solutions, 2014; The National Institute of Mental Health, 2016). This trend towards integrated behavioral health care is not meant to replace specialty mental healthcare, but rather to facilitate access to interventions in primary care settings or transition to higher levels of behavioral health care. As a result, progress has been made in diagnosing and treating mood, anxiety, and substance use disorders in pediatric and adolescent primary care settings (Chavira et al., 2014; Huijbregts et al., 2013; Weersing et al., 2016).

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1 However, currently no interventions exist to address PTSD in a pediatric or adolescent
2 primary care setting. This problem is particularly concerning because PTSD among adolescents
3 is associated with school dropout, high-risk sexual behaviors, depression, suicide attempts,
4 substance abuse, relationship problems, and arrests (Lipschitz et al., 2000). In addition, in adults
5 PTSD diagnosis is associated with more frequent and longer psychiatric hospitalizations, adding
6 burden to the healthcare system (Karthan Anand et al., 2008).

7 The lack of research with regards to PTSD management in pediatric and adolescent care can
8 be explained in part by multilevel barriers that exist. The vast majority of primary care
9 pediatricians report that they lack adequate knowledge, skills, and comfort to discuss or treat
10 PTSD (Banh et al., 2008; Cohen et al., 2008; Marsac et al., 2016). This may lead to reduced
11 assessment of PTSD and trauma-related symptoms, as noted in one study in which only 10% of
12 pediatricians routinely assessed and treated PTSD symptoms, and only 14% routinely asked
13 directly about trauma exposure (Banh et al., 2008). These findings indicate that PTSD in
14 adolescents is frequently undetected by primary care providers. Moreover, for those who are
15 identified, there are currently no evidence-based interventions for PTSD in adolescents that are
16 easily accommodated in primary care settings.

17 Evidence based treatments for PTSD in adolescents that are delivered in specialized mental
18 health services have been developed (Cohen & Mannarino, 2015; Schneider et al., 2013; The
19 National Institute of Mental Health, 2016). However, most are inappropriate for primary care due
20 to their session and treatment length and complexity. For example, trauma-focused cognitive
21 behavioral therapy (TF-CBT), requires intensive training of clinicians and 8 to 25 50-minute
22 sessions, making it infeasible for use in adolescent primary care (Cohen & Mannarino, 2015;
23 Schneider et al., 2013; The National Institute of Mental Health, 2016). Research on adults with
24 PTSD has found that the most important facilitator of primary care interventions for PTSD

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1 treatment has been that the interventions are not overly burdensome (Cohen et al., 2008). As
2 such, mental health interventions designed for primary care typically involve 3-5 sessions.

3 To address the lack of PTSD treatment in primary care for children and adolescents, clinical
4 researchers in the U.S. have called for the development of stepped-care approaches that provide
5 brief, low-intensity interventions for PTSD in child and adolescent primary care settings as a
6 stand-alone intervention before possible referral to specialty care (Cohen et al., 2008; Schneider
7 et al., 2013). Implementing existing interventions into new settings may be improved through
8 systematic adaptation which may not only increase the relevance of the intervention to the target
9 population and setting but may also facilitate ownership and buy-in of the intervention users
10 (Mckleroy et al., 2006).

11 The purpose of this study was to review the current literature and identify evidence-based
12 interventions for PTSD that may be most feasible for use in adolescent primary care and to use
13 qualitative data to adapt the selected intervention so that it was appropriate, acceptable, and
14 sustainable in adolescent medicine primary care. Using the Replicating Effective Programs
15 (REP) framework, qualitative data was used to develop the Primary Care Intervention for PTSD
16 (PCIP), a brief intervention for PTSD for use in adolescent primary care clinics (Kilbourne et al.,
17 2007). To our knowledge, this is the first intervention for PTSD designed specifically for use in
18 adolescent medicine integrated care.

19 **Methods**

20 **Study Site**

21 Boston Medical Center (BMC), located in downtown Boston, is the largest safety-net
22 hospital in New England, with 57% percent of patients from underserved populations and 72%
23 insured by government payors including Medicaid, Health Safety Net, and Medicare (*Boston
24 Medical Center Community Needs Assessment, 2016*). It is estimated that 23% of adult BMC
25 primary care patients have symptoms consistent with PTSD (Liebschutz et al., 2007). The study

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1 was conducted at BMC's Adolescent Center. Over 2,000 patients (ages 12-26 years) receive
2 primary and multidisciplinary care in the Boston Medical Center Adolescent Center every year.
3 This clinic includes an integrated behavioral health team that consists of four masters-level,
4 independently licensed social workers who provide assessment, triage, and short-term therapy in
5 the clinic. Between October 2017-January 2018, 2,569 patient visits were completed at the
6 Adolescent Center. Most (69%) patients were female and mean patient age was 17.7 years old
7 (SD=2.6); 53% of patients were Non-Hispanic Black or African-American, 16% were Hispanic
8 or Latino White or race not reported, 10% were Non-Hispanic White, and 21% were another race
9 or race/ethnicity was not available.

10 **Intervention Development**

11 We used the Replicating Effective Programs (REP) framework, which provides a guide to
12 implementing evidence-based interventions in community-based settings through intervention
13 identification and packaging, training and technical assistance, and various forms of support
14 (Kilbourne et al., 2007). The framework consists of four phases: (1) pre-conditions, (2) pre-
15 implementation, (3) implementation, and (4) maintenance and evolution. In this paper, we
16 addressed the first two phases of PCIP adaptation. The pre-conditions for intervention adoption
17 include the identification and adaptation of an evidence-based intervention for target populations.
18 The pre-implementation phase includes soliciting input from a community working group
19 (CWG) on package development, training, and support, conducting a package pilot test, and
20 preparing the intervention for implementation.

21 **Community Working Group [June-August 2017]**

22 As part of the pre-condition stage of the REP framework, a community working group
23 was convened with three providers from the Adolescent Center and the BMC Department of
24 Psychiatry to develop an a priori list of aspects of potential interventions that would be
25 acceptable and feasible for delivery in this adolescent primary care setting (Kilbourne et al.,

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1 2007). The community working group included the principal investigator, a clinical psychologist
2 (L.N.) with specialized training in child and adolescent PTSD, and one medical and one mental
3 health provider who work in the Adolescent Center. The community working group determined
4 that the intervention to be considered for adaptation should meet at least two of the following
5 criteria: (1) brief (with a preference for one to five sessions), (2) focused on targeting PTSD
6 symptomatology, (3) previously tested in a primary care setting, and (4) used with adolescents.

7 A literature review using PsycInfo and PubMed search engines to select potential PTSD
8 interventions to adapt for use in the Adolescent Center was completed in June 2017. The
9 following search terms were included in the literature search: PTSD, brief, primary care, and
10 children or adolescents. Filters were used to limit results to studies conducted in English or
11 translated into English (n=1, from Spanish was excluded). References from identified studies
12 were used to find other relevant studies that satisfied the inclusion and exclusion criteria.
13 Identified interventions had to specify PTSD as one of the primary outcomes and be brief.
14 Interventions that were conducted in primary care or with adolescents were prioritized for review
15 and discussion. Members of the community working group reviewed the results of the literature
16 review and selected the intervention that was most appropriate for adaptation.

17 Qualitative Interviews [October – March 2017]

18 As part of the pre-implementation stage of the REP framework, semi-structured,
19 qualitative interviews were conducted to adapt the intervention for use in the Adolescent Center
20 (Kilbourne et al., 2007). The interviews were designed to gain an understanding of barriers and
21 facilitators of implementing a brief PTSD intervention in the primary care clinic, and to consider
22 adaptations that would make implementation more feasible, acceptable, and sustainable (Table
23 S3). For example, participants were asked questions to determine the duration of the
24 intervention, the frequency of appointments, and who would be delivering the intervention.
25 Questions were also asked to explore whether the identified treatment model would be an

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1 acceptable intervention for the adolescent center patients. Semi-structured interviews with
2 patients and parents were conducted by the principal investigator (L.N.). Two undergraduate
3 research assistants who received training in qualitative research methods and interviewing
4 conducted interviews with clinic staff. All interviews were conducted in English and were audio
5 recorded and transcribed. The results were used to adapt the intervention treatment manual.

6 Participants

7 Inclusion criteria for patients were that they were between the ages of 13 and 21 (the
8 target patient age in the clinic), fluent in English, and willing to provide informed consent (or
9 assent for patients < 18 and consent from legal guardian). The number of patients in the study
10 was determined by the number needed to reach theoretical saturation. Potential patients (n= 22)
11 of the adolescent center were identified by medical providers and social workers based on
12 elevated risk of PTSD due to the presence of PTSD symptoms, a current diagnosis of PTSD,
13 previously disclosed potentially traumatic events or life circumstances, or comorbid mental
14 health or substance use diagnoses. We did not record demographic data of those patients who
15 were contacted for the study but ultimately did not enroll in the study.

16 Study staff contacted eligible patients who were over 18 and parents of minor patients to
17 recruit participants for the study. Patients under the age of 18 were able to participate if they
18 provided assent to participate in the study and their legal guardian also provided informed
19 consent for the patient, even if parents did not want to participate themselves. Interested patient
20 participants were asked whether they also consented to have their parent or legal guardian
21 interviewed. If they consented, their identified parent or guardian was approached for
22 participation. Two parents were approached and agreed to participate (Table S1).

23 All clinical staff (n = 12) in the adolescent center were invited to participate, including
24 physicians (n=3), nurse practitioners (n=1), nurses (n = 3) patient navigators (n = 1) and social
25 workers (n = 4). Therefore, sample size was limited by the total number of staff available. Due to

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1 the limited size of the clinic staff, some of the clinical staff interviewed for this study were also
2 members of the community working group that convened to select the intervention adapted in
3 this study. Informed consent was obtained from all staff participants in the study.

4 **Qualitative data analysis [April – July 2018]**

5 Thematic content analysis was employed to identify themes relating to changes to
6 intervention content and suggestions for implementation of the intervention (Smith, 1992). Two
7 research assistants independently reviewed 4 of 19 transcripts and together generated a codebook
8 based on the 20% of the interviews that were double-coded. They reviewed the codebook with
9 the principal investigator (L.N.) to ensure agreement in interpretation of codes and internal
10 validity of the codes. Validity was further monitored by all coders referring back to the
11 qualitative interview guides during code generation. Once the codebook was finalized, the
12 research assistants coded the remaining 15 interviews in NVivo using consensus coding, a
13 method that involves both research assistants discussing the content of an interview prior to
14 assigning codes (QSR International Pty Ltd, 2018).

15 **Adaptation [July – August 2018]**

16 After coding was completed, researchers mapped suggested changes generated from the
17 qualitative data onto adaptations of the intervention. Content from the qualitative interviews was
18 coded, and all suggestions were considered for modifications. The community working group
19 made adaptations based on how many endorsements a suggestion received while considering
20 what was feasible for the clinic to implement. It should be noted that during data analysis,
21 participant role (e.g., social worker) was not considered when deciding which adaptations to
22 include. However, some of the suggestions made by patients and parents were not feasible to
23 implement in the clinic and thus were not included in the adaptation. All modifications to the
24 PCIP intervention were made in accordance with Centers for Disease Control and Prevention
25 guidelines on adapting evidence-based interventions (Mckleroy et al., 2006).

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Results**Intervention Selection**

The literature search generated 193 abstracts via PsycInfo and 233 abstracts via PubMed. None of the identified studies met all four a priori targets (brief, targeted for PTSD, used in primary care, targeted to adolescents). Fifty-two studies met at least one of the inclusion/exclusion criteria, and nine met two or more of the criteria (Table S2). Full texts of the nine studies were assessed and considered for adaptation for use in the adolescent primary care setting. All nine interventions were conducted in adult populations. Specifically, five interventions were primarily conducted in military and veteran settings and seven were conducted in an adult primary care setting (Table S2).

The community working group reviewed the nine interventions (Table S2) and discussed desirable components of the intervention with the study team (Brunet et al., 2013; Cigrang et al., 2015; Craske et al., 2011; Engel et al., 2008, 2015; Harmon et al., 2014; Kaltman et al., 2016; Nishith et al., 2015; Possemato et al., 2016). The community working group expressed concern about interventions that would require the discussion and processing of the traumatic event(s), as they deemed this inappropriate given the limited time constraints of an integrated care setting. Therefore, interventions were limited to those that did not require active processing of the trauma experience (n =5) (Table S2). The community working group ultimately selected the Brief Intervention, later re-named the Brief Relaxation, Education And Trauma Healing (BREATHE) intervention for adaptation (Mueser et al., 2017) from the list of reviewed interventions in Table S2 due to its length (3 sessions), flexibility, and utilization of cognitive behavioral therapy techniques that were already in use in the clinic (i.e., psychoeducation and breathing retraining).

BREATHE is a low-intensity, evidence-based intervention that was originally designed to treat PTSD in adults (ages = 45.8 ± 9.74 years). Treatment with BREATHE demonstrated efficacy in reducing PTSD symptoms 1-month post-intervention (Nishith et al., 2015). The main

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1 components of the BREATHE intervention include (1) video-based psychoeducation through
2 handouts about trauma and PTSD using real-life patient experiences and (2) breathing retraining
3 to reduce anxiety and physiological arousal (Mueser et al., 2017). These two components are
4 also core elements of almost all evidence-based PTSD interventions, including trauma-focused
5 cognitive behavioral therapy, the subspecialty-based PTSD intervention with the largest evidence
6 base for adolescents (Cohen et al., 2010; Kowalik et al., 2011; Morina et al., 2016).

7 **Qualitative Interviews**

8 Nine patients (mean age = 17.6 ± 2.7) participated in the study. Of the nine patients, five
9 identified as female, three identified as male, and one identified as gender nonconforming (Table
10 S1). Furthermore, seven patients identified as black, one as white, and one as non-Hispanic white
11 (Table S1). Although the sample size for this study was small, the participant demographics are
12 similar to the overall demographics of the patient population of the Adolescent Center at BMC.
13 A total of eight of the 12 members of the clinic staff agreed to participate (physicians (n=2),
14 nurse practitioners (n=1), patient navigators (n=1), and social workers (n=4)).

15 **Adaptations**

16 Treatment adaptations modified some of the methods of delivery, therapeutic activities,
17 and manual/worksheet language without changing the core elements of the original BREATHE
18 intervention that had been found to be effective (i.e. breathing retraining and psychoeducation).
19 Results of the qualitative data fell largely into two categories: implementation and intervention
20 content. Table 1 provides example quotes for each aspect of the qualitative data and provides a
21 breakdown of the qualitative data by participant type.

22 ***Implementation***

23 **Individual or group therapy.** Participant opinions differed on whether the intervention
24 should be delivered in an individual or group format. Generally, patients and parents expressed
25 some interest in receiving the intervention in a group format. However, there was less support

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1 from the medical providers on providing treatment in a group format due to challenges with
2 coordinating patient availability and transportation, making this format infeasible for use in the
3 clinic (Table 1).

4 **Involvement of Caregivers and Family Members.** Most participants (n=13, 68%)
5 thought that having parents directly involved in the intervention (e.g., by attending family
6 therapy sessions) could be helpful for the overall treatment of the adolescent, as long as patients
7 retained the choice to invite or exclude family members. However, three patients and three clinic
8 staff expressed concerns that having parents involved in the treatment could be a significant
9 barrier to treatment because family members may be associated with some patients' trauma
10 experiences or family members may have their own stigma about the trauma or mental health
11 that would prevent the patient from receiving treatment,

12 **Number and Frequency of Sessions.** The number of sessions desired for the
13 intervention varied amongst participants. Many participants (n=7, 37%) agreed that multiple
14 sessions would be necessary to adequately deliver the intervention, although two social workers
15 urged that the intervention must be effective in one stand-alone session due to the fact that there
16 is a high drop-out/no-show rate in the Adolescent Center. Another notable comment in regard to
17 the number of sessions was the desire for flexibility (n = 7, 37%) based on the individual
18 patient's needs. Most participants (n = 11, 58%) favored a weekly or bi-monthly frequency for
19 the intervention sessions.

20 **Treatment delivered at the time of medical appointments and identification of need.**
21 To increase patient retention and participation, many participants (n=6, 32%) suggested that the
22 appointments for the intervention be scheduled adjacent to co-occurring medical appointments
23 and immediately when need is identified.

24 **Provider Training and Education.** Many participants agreed that the person delivering
25 the intervention should be the medical provider that identified the trauma/PTSD (n=5, 26%). All

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1 eight staff members agreed that although they were trained to provide mental health care, they
2 would like to have additional training in trauma-focused care (n = 4, 50%) before delivering an
3 intervention for PTSD to patients.

4 **Provider Characteristics.** Overall, many participants (n= 13, 68%) noted that it is
5 important for the patient to be familiar with the provider. For providers, this meant that the
6 intervention would be delivered by a staff member who has an established relationship with the
7 patient (n=7, 88%), while patients felt that familiarity meant that providers should have similar
8 ethnic/racial backgrounds and/or gender identities as the patient. In addition, many patients
9 explicitly stated that it was critical that providers be trustworthy (n=5, 56%).

10 ***Content***

11 **Psychoeducation.** In the original BREATHE intervention, psychoeducation about trauma
12 and PTSD was delivered through the use of an assessment and video vignettes of adults with
13 PTSD. All (n=19, 100%) of the participants noted that the inclusion of psychoeducation, in some
14 form, was helpful and should be kept in the intervention.

15 Additionally, four participants (21%), mentioned that presenting the psychoeducation
16 through technology (i.e. iPads, apps) would be the most helpful for the adolescent population.
17 On the other hand, four other participants reported that watching other people discuss their
18 experiences with trauma and PTSD on a video may be triggering for patients.

19 Small clips of the videos from the BREATHE intervention were played for the
20 participants during the interviews. Most patients (n = 8, 89%) thought that it was helpful to hear
21 others' stories in a video format. However, most participants thought that the specific
22 BREATHE videos were less than likely to be helpful for the adolescent patient population
23 because they only showed adults and not adolescents (n=13, 68%) and because they were boring
24 (n=6, 32%), not relatable (n=4, 21%), or dated (n=6, 32%). Participants also noted that there was
25 a lack of diversity in the videos that might not resonate with the clinic patients (n=6, 32%).

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1 **Breathing Retraining.** During the interviews, participants were asked to reflect on the
2 potential utility of breathing retraining for the Adolescent Center patients. The majority of
3 participants thought that the breathing retraining would be very helpful for the patients (n = 13,
4 68%). Some participants, however, were skeptical that adolescents would voluntarily participate
5 or that it would be effective for the patients and clinic staff (n = 3, 16%).

6 **Suggested Additions to BREATHE.** Throughout the interviews, participants suggested
7 other mechanisms that would be helpful to add to the intervention. Many participants (n=10,
8 53%) suggested that teaching additional strategies to cope with distressing symptoms would be
9 useful additions. A few patients (n = 3, 33%) suggested mindfulness or meditation interventions
10 based on their past experience learning these skills, and one provider suggested including a
11 motivational component to the intervention.

12 Implementation Adaptations

13 Based on overall participant opinions, the intervention was adapted to allow for
14 flexibility in session length and frequency. The number of sessions remained at three, noting that
15 additional sessions could be provided depending on the patients' needs. Given concerns about
16 high treatment dropout, the first PCIP session included delivery of both the primary therapeutic
17 components of breathing retraining and some of the PTSD psychoeducation to reflect providers'
18 desire for the intervention to be comprehensive in a single, stand-alone session. Session length
19 was allowed to vary between 30-50 minutes depending on the needs of the patient and
20 provider/clinic. Sessions were designed to ideally occur once a week, though the intervention
21 manual acknowledges this may not be feasible and that patients may be seen bi-weekly or
22 monthly. The PCIP allows family members to participate in the treatment with permission from
23 the client. For patient convenience, as often as is possible, sessions were scheduled before or
24 after a medical appointment. The intervention is delivered in a one-on-one setting by licensed
25 behavioral health social workers. Intervention delivery could occur in exam rooms, consult

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1 rooms, or social worker offices depending on clinic flow, need, and space availability. The
2 results also indicated that the clinic staff would like to have additional training on this
3 intervention before delivering it. While the clinic social workers were experienced in using CBT
4 techniques and strategies to address depression and anxiety symptoms, the interviews indicated
5 that clinic staff desired additional training on the specific intervention due to their limited
6 training in trauma/PTSD care. A two-day training, which focused on the identification of PTSD,
7 trauma-focused care, and implementation of the intervention, was completed by two authors for
8 the licensed social workers who were embedded within the primary care clinic.

9 Content Adaptations

10 Although some participants suggested that new videos using adolescents from diverse
11 backgrounds be developed for this intervention, developing new videos, particularly given that it
12 was clear videos would have to be tailored and kept updated for a changing patient population,
13 was deemed infeasible and unsustainable for the clinic. Therefore, the decision was made to
14 deliver the psychoeducation material in person through discussion and worksheets/handouts
15 rather than through videos.

16 The breathing retraining was retained without modification, as it was supported by the
17 great majority of participants. To address participant's suggestion that coping skills be included,
18 discussion and homework activities on coping skills that target the main symptoms of PTSD
19 were added, drawing upon material from the original treatment manual (Mueser et al., 2017).
20 Finally, mindfulness psychoeducation and techniques were incorporated by adding cognitive
21 defusion exercises, such as techniques to distance oneself from one's thoughts.

22 Some themes that arose during the interviews were not included in the adaptations
23 because they were infeasible. For example, many patients indicated that they would be more
24 comfortable if someone from a similar racial/ethnic background or gender identity delivered the
25 behavioral health intervention. However, this suggestion was not feasible in the clinic.

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1 Furthermore, we considered adding a component specifically targeted to parents or caregivers.
2 However, the interviews suggested that inclusion of family members may interfere with
3 treatment, and therefore the decision was made to not include a separate treatment component for
4 parents and caregivers, and instead have parents or caregivers invited in to participate in the
5 treatment if the patient wanted to include them. Finally, we considered including a separate
6 motivational component, however, because of the brevity of the intervention and because this
7 suggestion was only mentioned by one participant, we decided against including a formal
8 motivational component to the intervention. Instead, we encouraged clinicians to focus on
9 motivating clients through the provision of hope, validation, and psychoeducation techniques
10 that destigmatize PTSD, which was already emphasized in the BREATHE intervention.

11 **Discussion**

12 This study builds upon the field of integrated care by developing the first intervention
13 designed to be acceptable and feasible for PTSD in an adolescent primary care setting. The
14 adapted intervention is called the Primary Care Intervention for PTSD (PCIP). As designed, the
15 PCIP intervention could be implemented as a standalone intervention or could act as the first step
16 of a stepped-care treatment model, allowing patients to engage in care and start to manage their
17 PTSD symptoms in a pediatric practice. Although the efficacy of the PCIP at reducing PTSD and
18 associated symptoms and improving functioning must be tested, for patients who experience
19 significant barriers to accessing subspecialty mental health treatment, or for patients unable to
20 engage in longer PTSD treatments, the PCIP may be an accessible treatment that could result in
21 significant symptom improvement. Additionally, this intervention may enhance patient
22 motivation and willingness to engage in long-term treatment for PTSD in specialized mental
23 health clinics and includes a component for discussion of the possibility of additional treatment.

24 The results of this study and the development of the PCIP should be considered in the
25 context of the limitations of the study. While the qualitative interviews provided in-depth

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1 feedback on the BREATHE intervention for adaptation, our small sample size may limit the
2 broad applicability of the PCIP for use in other clinics. Due to the limited size of the clinic staff,
3 members of the community working group were included as participants in the qualitative
4 interviews, which may confound the results. However, in order to develop a feasible
5 intervention, these individuals were involved in all stages as they are the primary decision
6 makers and would be implementing the intervention in the clinic. Additionally, the patient
7 sample is not representative of the patient population, and the homogenous (mostly white, all
8 female) clinic staff may reduce the generalizability of our results. Patients were recruited for this
9 study based on a history of traumatic experiences but were not necessarily diagnosed with PTSD.
10 However, considering the barriers to PTSD screening in primary care clinics, this intervention
11 was designed to be attractive and accessible to youth who may have undiagnosed PTSD.

12 There are some limitations to the current intervention that should be considered.
13 Although the PCIP was designed to be feasible for use in a primary care clinic that serves
14 adolescents, there are still many challenges to implementing a brief psychological therapy within
15 a primary care setting. Logistical barriers, like finding office space for therapy sessions and
16 adequate staffing may limit the feasibility of implementing such an intervention. It is important
17 to note that the PCIP was not designed to be delivered by primary care physicians, but rather by
18 integrated behavioral health social workers with experience delivering brief cognitive-behavioral
19 therapy (CBT) interventions. If integrated behavioral health providers do not already have
20 training in brief CBT techniques or PTSD care, they may require more extensive training than
21 the present intervention manual provides, which may be impractical for some clinics. We were
22 not able to address some of the suggestions regarding matching patients to providers with similar
23 backgrounds (gender/ethnicity). However, when considering the PCIP for clinical practice,
24 additional staff training on cultural competency and humility may improve the acceptability of
25 the PCIP.

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1 Despite these limitations, the Primary Care Intervention for PTSD (PCIP) may be a
2 resource that primary care clinics can implement into their practice as a feasible intervention for
3 patients with PTSD, thereby increasing access to care and reducing the number of adolescents
4 living with untreated PTSD. Two future directions would be to assess PCIP efficacy on PTSD
5 symptoms in a randomized trial and to assess PCIP as the first step in a stepped care model for
6 adolescents who warrant a higher level of care. To our knowledge, this is the first intervention
7 for PTSD designed specifically for use in adolescent medicine integrated care. The PCIP
8 capitalizes on the increasing availability of integrated behavioral health in primary care, and fills
9 a gap by providing the first intervention for PTSD for adolescents that may be feasible and
10 sustainable in real-world care by existing integrated care staff working within real world
11 adolescent medicine primary care limitations.

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Table 1: Example Quotes

Adaptation Theme	Example Quote	Patients (N = 9)	Parent (N = 2)	Providers (N = 8)
Group therapy could be a helpful format	<p>“[Group therapy] could be a good option for some ...people who have to understand that they’re not alone because a lot of the things ...with victimization is feeling like you’re the only one going through it. So, understanding that you’re not, and finding people who are similar to you, can be effective. But, for other people, hearing about other people’s stories can just re-traumatize that person. It just obviously depends on the individual. I think having it available is great because some people need that” (Patient, 19, Male).</p>	6 (67%)	2 (100%)	1 (13%)
Provider should be someone familiar	<p>“I feel like the more the person knows the provider, the more they can ... trust the person” (Patient, 19, Male).</p>	5 (56%)	1 (50%)	7 (88%)
Involvement of Caregivers and Family Members	<p>“It would be great if it were something the parents did not need to be involved in. So, that, adolescent minors could seek care even if they didn’t want their</p>	6 (67%)	2 (100%)	5 (63%)

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parents to know what is going on... I think that it's more likely to be a barrier then it is to be helpful" (Physician, Female).

Treatment delivered at the time of medical appointments and identification of need	<p>“Tends to increase our engagement and our show rate. I think not having it be something where the need is identified and then the patient has to come back to get the first session. But having it, the need is identified, someone walks in and delivery starts in that first moment. Because we know that people don't come back. I think those are the big things” (Social Worker, Female).</p>	2 (22%)	0 (0%)	4 (50%)
Breathing Retraining would be helpful	<p>“They'll feel it right away, they'll feel that response almost immediately. I think it gives them a sense of power/control and they feel it right away” (Social Worker, Female).</p>	8 (89%)	2 (100%)	3 (38%)
Psychoeducation is helpful and beneficial as a mechanism	<p>“A lot of people think, ‘oh my God PTSD—soldiers, marines and that's what they think. They don't think house fire victims. They don't think rape victims. They don't think just the common everyday people and I think that it would be good to explain that PTSD can...anybody can get it and it's not always just from</p>	9 (100%)	2 (100%)	8 (100%)

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	being shot at or gunfire in combat. It can literally be breaking your leg, crossing the street and thinking that the streets are bad luck” (Patient, 17, Female).			
Psychoeducation videos would not resonate with adolescent patients	“Those were done 10 or 15 or 20 years ago and, I think that having one that’s just updated in general, specifically one that’s updated with adolescents or young adults and their experiences would be way more helpful and relatable, than a bunch of white people.” (Physician, Female).	5 (56%)	1 (50%)	7 (88%)
Additional mechanisms to include	“I do this with patients... [I] talk about ‘how are the ways you are currently coping, which of those are working for you which of those are not working for you?’” (Social Worker, Female). “Just teaching people how to use their coping mechanisms in the best situations and when and how.” (Patient, 17, Female).	4 (44%)	1 (50%)	5 (63%)