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Integrating a trauma recovery center into an urban hospital setting serving multiply marginalized patients in the Southeastern United States

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Abstract

Background Few interpersonal violence survivors receive psychosocial services, and those who are multiply marginalized are among the least likely to receive needed care. Trauma recovery centers (TRCs) aim to reduce health disparities by increasing access to trauma-focused care. This study describes the initial adoption, implementation, and reach of the first TRC in the southeastern USA.

Methods Funding was awarded to support the adoption of the Grady TRC within an urban safety net hospital in Atlanta, Georgia, and interdisciplinary collaboration was leveraged to support implementation. The electronic health records of 3,238 adult patients seeking medical care were screened for TRC eligibility to determine the program's reach (2020–2023).

Results 53% (n = 1,712) of patients were eligible for TRC services; of these, 16.8% completed TRC intake assessments (n = 288; 84.4% Black, 58.3% female, 47.1% referred for gunshot wounds). Most TRC patients (68.1%; n = 196) screened positive for probable posttraumatic stress disorder (PTSD); many endorsed severe anxiety (44.8%, n = 129) or depressive (23.6%, n = 68) symptoms. Most reported no/low alcohol and drug use.

Conclusions A demonstrable need for trauma-focused services was found among violence-exposed patients seeking public healthcare. Integrating the TRC model into institutions serving multiply marginalized patients may help increase access to trauma-focused care for those who may not otherwise receive it.

Keywords Trauma recovery center, Interpersonal violence, Posttraumatic stress disorder, Trauma-informed care

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Interpersonal violence, defined as an experience in which one (or more) individual(s) intentionally perpetrates or exposes another to violence using force or power (e.g., sexual or physical assault, gun violence, human trafficking), is linked to a myriad of poor health outcomes [1, 2]. Certain demographic characteristics confer greater risk for interpersonal violence exposure and its consequences [3–5]. For example, those with greater levels of disadvantage due to systemic oppression, including individuals who are poor, unhoused, living in inner-city areas, people of color, and people with disabilities, are more likely to be victimized and experience more negative traumarelated health outcomes than those with more resources and privilege [6-8]. While few survivors of interpersonal violence receive mental health treatment or other forms of psychosocial support [9], those who are multiply marginalized (i.e., have intersecting vulnerabilities) are among the least likely to receive needed services [10, 11].

Healthcare settings are frequented by interpersonal violence survivors in need of care [12, 13]. Acute trauma victims often enter medical care through emergency departments [14–16]. Routine medical care settings, like primary care and gynecology and obstetrics clinics, are additional spaces where patients seek medical care for chronic trauma-related symptoms (e.g., chronic pain, depression) [11, 17]. While these settings are ideal for the provision of comprehensive, trauma-informed, integrated health services, many healthcare systems view psychosocial and physical health concerns as distinct phenomena [18]. This ideological disconnection often results in a spatial separation of medical care from mental/behavioral health care and social services, which can contribute to a lack of care coordination and reduced patient engagement (e.g., due to stigma, lack of awareness of resources or need) [19]. Medical providers are rarely systematically trained in the provision of trauma-informed care [20] or screening for trauma symptoms, which prevents efficient determination of treatment needs [21]. Further, existing programs offering an array of medical, psychological, and social services specific to the unique needs of interpersonal violence survivors are inaccessible for many [22]. An integrated model of care is needed to address the medical, psychological, and social consequences of interpersonal violence among healthcare-seeking patients.

With increasing recognition of socioeconomic health disparities along with the deleterious impacts of interpersonal violence, community-based organizations, universities, and hospitals have implemented and advocated for the expansion of the *trauma recovery model* [23]. The Trauma Recovery Center (TRC) is a relatively new, patient-centered model of care that uses evidence-based practices to promote recovery among survivors of violent crime [24]. The TRC model distinguishes itself by utilizing an interdisciplinary team-based model of care

- specifically designed for patients who are survivors of violent crime - that integrates a team of professionals in a range of disciplines, including medicine, mental/behavioral health, social work, and public health, in the hospital and outpatient setting. Building trusting relationships with violence survivors and their support systems, using assertive outreach, and removing barriers to community resources are key components of the TRC model.

Atlanta, Georgia represents a critical area for the services offered through the TRC model for several reasons [25, 26]. First, no other TRCs are located in the southeastern region of the United States, and Atlanta is the Southeast's largest city. Second, many Atlanta residents are multiply marginalized. The city's poverty rate is roughly twice the national average, and most of Atlanta's residents are racially and/or ethnically minoritized [27]. Atlanta also has the greatest racial wealth gap in the nation [28]; Black residents are disproportionately burdened, with their median household income being one-third that of White residents. Third, rates of crime in Atlanta are among the highest in the country, with an average of reported crimes against persons happening once every 72 min, almost a quarter of which involve a firearm [29]. Despite having greater healthcare needs due to increased interpersonal violence exposure, individuals who are multiply marginalized with few socioeconomic resources often have limited access to care, meaning the Atlanta community would likely benefit from incorporation of the TRC model.

This study describes the initial adoption, implementation, and reach of the Grady TRC in Atlanta, Georgia, which represents the first TRC located in the southeastern United States. At all stages of developing and integrating the TRC, we adhered to Reach, Effectiveness, Adoption, Implementation, and Maintenance/Sustainment (RE-AIM) [30, 31], a framework used to ensure the public health significance of programs/interventions. In accordance with the RE-AIM framework, this manuscript reviews the Grady TRC's origins, key stakeholders, and goals (Adoption); details the practical implementation of the TRC model (i.e., clinician onboarding, patient flow), adaptations to the original TRC model and site-specific considerations, and elements of the Grady TRC that have changed over time (Implementation); and describes the Grady TRC's patient population (*Reach*) during its first three years of operation (2020-2023).

Methods

Grant funding: adoption

The *Adoption* of the Grady TRC was made possible by extramural grant funding awarded based on the demonstrable need to better address the psychosocial consequences of trauma exposure among patients of Grady Memorial Hospital [20, 21], a Level 1 trauma center and

safety net hospital in Atlanta, Georgia. Grady Memorial Hospital belongs to Grady Health System, an urban public healthcare system that provides medical care to predominantly multiply marginalized patients, most of whom do not have access to private health insurance or mental health care [32]. In addition, a long-standing, hospital-affiliated clinical research program [10] found that among patients seeking healthcare from Grady Memorial Hospital, 91% of those surveyed reported exposure to one or more traumatic events, and 32% met diagnostic criteria for probable PTSD [11]; yet, few reported receiving psychiatric treatment [17]. Taken together, Grady Memorial Hospital tends to provide care to socioeconomically vulnerable individuals with high rates of trauma exposure and significant unmet mental health care needs.

Data documenting unmet mental health needs among trauma-exposed patients and the lack of available hospital-based resources were leveraged to gain the support of hospital leadership and program funders to develop a TRC that provides wraparound medical, psychological, and social services to Grady patients exposed to interpersonal violence. On October 1, 2019, the Grady Health System received a 2-year grant from the Georgia Criminal Justice Coordinating Council's (CJCC) Victims of Crime Act (VOCA) to create the Grady TRC. A TRC steering committee was convened and adopted the following as the program's overarching goal: to administer culturally responsive, trauma-informed, and clinically and cost-effective care to underserved survivors of violence, combining clinical case and psychiatric medication management, trauma-focused psychotherapy, and outreach services in an urban hospital setting.

Interdisciplinary collaboration: implementation

Based on the feedback of the steering committee, a smaller working group, including an emergency medicine physician, a psychologist (AP/senior author), a clinical nurse, and administrative staff, along with CJCC administrators, was formed in November 2019 to promote successful TRC Implementation within Grady Memorial Hospital. This group met weekly to develop the Grady TRC manual based on the San Francisco Trauma Recovery Center Model [33] and to formulate Grady TRC flow within the larger hospital system. Dr. Alicia Boccellari, the founder of the first TRC at Zuckerberg San Francisco General Hospital, served as an active consultant throughout this process. The working group also was tasked with hiring the initial Grady TRC staff, including the clinical director (board-certified psychologist), medical director (internal medicine/psychiatry dual board-certified physician), clinical supervisor (licensed clinical social worker), two full-time masters-level clinical staff, and a data analyst. Staff operate under the direct supervision of an interpersonal violence prevention manager, who is supervised by the emergency department's director of nursing.

During the Implementation phase, the Grady TRC team remained aware of the need to work closely with existing psychological services to address remaining treatment gaps. Meetings were scheduled with stakeholders of programs throughout the hospital to discuss referral flow, examine connection across services (e.g., inpatient, primary care, outpatient behavioral health), and identify potential barriers or challenges that may affect implementation. Particular emphasis was made on incorporating the model within the existing emergency department flow, given the need to create warm handoffs for trauma survivors directly following trauma exposure, and not interfering with other established programs (e.g., rape crisis center). To assess Grady TRC Implementation, clinician onboarding, patient and referral flow, adaptations to the original TRC model and sitespecific considerations, and changes in program capacity and resources across time, as agreed upon by the steering committee and TRC's interdisciplinary leadership team, are described.

Electronic health record: reach

In addition to describing the *Adoption* and *Imple-mentation* of the Grady TRC via awarded funding and interdisciplinary collaboration, this study involved a retrospective review of the hospital-based electronic health records (EHR) of enrolled patients to describe Grady TRC's *Reach*. Specifically, three data sources were used: (1) eligibility screenings, (2) background interviews, and (3) intake assessments.

Eligibility screening

Clinicians review patients' EHRs for Grady TRC eligibility criteria, which are then entered into a custom database to determine eligibility and document screening. As determined by the funding source, any Fulton/DeKalb County resident aged five or older that has experienced a physical trauma (e.g., domestic violence, sexual assault, physical assault, gunshot wounds, stabbings, burns, falls, human trafficking, motor vehicle collisions) in the past three years is eligible for Grady TRC services. The eligibility screening database is also used to track the outreach and enrollment processes for patients deemed eligible.

Background interview

Patients deemed eligible for TRC services via chart review are contacted at least three times. Once contact is initiated, the clinician completes a background interview to confirm patient eligibility based on inclusion criteria assessed via chart review, gauge patient interest in Grady TRC services, and determine treatment needs (e.g., all services, case management only) and barriers (e.g., lack of internet access, transportation concerns, incarceration) (See Supplemental file). This internally developed background interview is also used to determine whether the patient meets the exclusion criteria: active psychosis, suicidality including attempt in the past six months, and current engagement in individual psychotherapy. Background interview information is stored within the patient's chart in the EHR. If eligible for and interested in TRC services, an intake assessment is scheduled.

Intake assessment

Eligible patients interested in TRC services complete an intake assessment with a trained clinician to assess psychological, medical, legal, family, and social histories and their needs for case management and/or psychotherapy; these data are stored within the patient's chart in the EHR. During the intake assessment, the patient's current psychological symptoms are assessed using the following measures:

- PTSD Checklist for DSM-5 (PCL-5). The PCL-5 [34], a 20-item self- report questionnaire, is used to measure PTSD symptoms. Respondents indicate the extent to which they were bothered by symptoms that correspond with the *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-*5) criteria for PTSD in the last month. Items are rated on a 5-point scale ranging from 0 (Not at *all*) to 4 (*Extremely*), with higher scores indicating more traumatic stress symptoms. A score of 33 was used as a cut-off in the current study. The PCL-5 has demonstrated strong validity and high internal consistency and test–retest reliability [35–37] in this patient population [38]. Internal consistency was excellent in this study (α = 0.91).
- Generalized Anxiety Disorder-7 (GAD-7). The GAD-7 [39], a 7-item self-report measure, is used to assess anxiety symptoms over the last two weeks. Respondents rate each item on a 4-point scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*). Respondents also were asked to indicate the degree to which their symptoms have made their work, home lives, and relationships difficult (*not difficult at all, somewhat difficult, very difficult*, or *extremely difficult*). Total scores range from 0 to 21, with higher scores indicating more anxiety symptoms. In the current study, the GAD-7 demonstrated good internal consistency (α = 0.88).
- Patient Health Questionnaire-9 (PHQ-9). Depressive symptoms are measured using the 9-item PHQ-9 [40]. Each item is scored on a 0 (Not at all) to 3 (Nearly every day) scale, with total scores ranging from 0 to 27. Higher scores indicate more depressive

symptoms. Internal consistency in this sample was good ($\alpha = 0.83$).

- Alcohol Use Disorder Identification Test (AUDIT). The AUDIT [41] is a 10-item self-report measure developed to screen for alcohol use disorder in the past year. Response options range from 0 to 4 for each item, with higher scores indicating greater likelihood of alcohol use and related problems. The AUDIT demonstrated good internal consistency in this study (α = 0.89).
- Drug Abuse Screening Test-10 (DAST-10). The DAST-10 [42] is a brief self-report measure used to screen for past-year drug use (i.e., the use of prescribed/over-the-counter drugs in excess or any non-medical use of drugs). Ten dichotomous items (0 = No, 1 = Yes) are summed to generate a total score ranging from 0 to 10, with higher scores indicating more problematic drug use. The DAST-10 demonstrated good internal consistency in this study ($\alpha = 0.75$).

Data were collected between November 11, 2020 and September 30, 2023. All study procedures were approved by Emory University Institutional Review Board (IRB) and Grady Research Oversight Committee; informed consent was waived by the IRB for secondary data analysis. This study was conducted in accordance with the Declaration of Helsinki. This study also highlights discussion with TRC steering committee and interdisciplinary team members and summarizes relevant administrative data. Referral sources, the number of cases admitted to the hospital and eligible for TRC services, and number of patients who completed background interviews and intake assessments were documented. Descriptive analyses were conducted using R, and all other analyses were conducted in SPSS v. 30.0. Two t-tests were conducted to examine whether psychological symptoms at intake assessment differed by patient sex (male vs. female) and race (Black/African American vs. White, given small ns of other racial/ethnic groups), and a one-way analysis of variance with post-hoc LSD tests was conducted to determine whether symptoms differed by trauma category among patients who were the primary victim (i.e., stabbing, sexual assault, physical assault, motor vehicle accident, gunshot wound, domestic violence). A correlation matrix was also generated to determine whether symptoms were related to age at the bivariate level.

Results

Adoption

Upon receipt of the grant, Grady Health System established a Grady TRC steering committee, which included 15 hospital and university-affiliated administrators, staff, and faculty with expertise in trauma-informed care and behavioral health, as well as CJCC administrators. To

ensure that the TRC would complement existing psychological services, leaders affiliated with the integrated behavioral health team in Grady primary care clinics, the rape crisis team housed within the emergency department, and two active clinical research programs that treat trauma patients at the hospital were included as members of the steering committee. At the initial steering committee meeting, the TRC model [33] was introduced, and the general plan for implementation was described. Dr. Boccellari worked closely with the committee, the funder, and the hospital administration to ensure smooth adoption of the TRC model within the hospital system. The goal of the steering committee was to set the hospital up for successful implementation, to ensure that all necessary and interested stakeholders were included in the conversation from the beginning, and to identify potential issues or challenges at the outset. Based on stakeholder feedback during the first committee meeting, more individuals were invited to subsequent meetings, although attendance records were not kept. The steering committee held two additional monthly sessions to continue the discussion of the new program, implementation strategies, and fit with other hospital programs. Potential issues or challenges were reviewed as a committee, and stakeholders were encouraged to give critical feedback on the plan.

Implementation

Clinician onboarding

All Grady TRC clinicians are required to have received, at minimum, a master's degree in a counseling-related field (e.g., professional counseling, psychology, marriage and family therapy, social work). Following hospital orientation, new victim services employees transition to the TRC for an in-depth onboarding process lasting approximately 4-6 weeks. New hires receive a comprehensive checklist of required trainings and milestones. During this period, they engage in self-paced learning, including prerecorded webinars on Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) [43, 44], Written Exposure Therapy (WET) [45], and Cognitive Behavioral Therapy for Insomnia (CBT-I) [46]. Additionally, they review recorded meetings and webinars with program partners to familiarize themselves with available case management resources. If a TRC clinician has not yet completed basic Eye Movement Desensitization and Reprocessing (EMDR) [46, 47] training, the director will identify and facilitate enrollment in an appropriate training program to ensure the clinician is equipped with the necessary skills. To ensure a thorough understanding of their role, new staff shadow experienced team members while gradually increasing their responsibilities. They receive structured support through weekly individual supervision (1 h) and group supervision (2 h), allowing them to ask questions, discuss challenges, and gain clarity on expectations. Once the onboarding checklist is complete and they have had sufficient time shadowing, new hires begin taking on clients, starting with two per week until a full caseload is reached.

Patient and referral flow

The program flow from initial identification of potential patients to Grady TRC service enrollment is outlined in Fig. 1. The Grady TRC operates on weekdays from 9:00am to 5:00pm. During business hours, a dedicated clinician is on-call to monitor the emergency department tracking board for newly admitted patients that may be eligible for TRC services and to conduct eligibility screenings of their charts. The program also accepts internal referrals within Grady Health System and external referrals from community partnerships by phone, secure email, and EHR; referrals can also be made on behalf of secondary victims (i.e., homicide or sexual assault victims' loved ones, non-offending caregivers). As a hospital-based program, the team can recognize and assist survivors of traumatic incidents the same day injuries are incurred (except weekends, in which case reports are run on Mondays to determine patients treated since the previous Friday). Eligibility screening occurs on a patient's chart while they are in the hospital receiving immediate care post-trauma, via phone or referrals from outpatient providers or external partners, or after discharge if the patient received medical care on a Saturday or Sunday.

If a patient is deemed eligible for Grady TRC services via chart review, a Grady TRC clinician utilizes assertive community outreach by attempting to contact the patient (up to three times). Upon connecting with the eligible patient, the clinician completes a background interview with the patient to determine their level of interest in Grady TRC services, if and how Grady TRC can meet their needs, and whether hospital-based or community referrals are required. During the background interview, the clinician confirms eligibility criteria met via EHR screening are accurate, administers a series of brief questionnaires assessing current psychological symptoms and psychological and case management needs, and ensures exclusion criteria are not met. If a patient is deemed ineligible for TRC services due to meeting exclusion criteria, they are referred to two outpatient behavioral health service programs affiliated with Grady Memorial Hospital.

If the patient meets eligibility criteria and is interested in receiving services from the TRC, an intake assessment is completed by a licensed clinician. After the intake assessment, patients accepted for services can expect to receive up to 16 psychotherapy sessions with a mental health care provider and unlimited case management services throughout their engagement with TRC. Patients



Fig. 1 Grady TRC implementation. Note: Darker shades of gray indicate closer proximity to or involvement with TRC services. ED = Emergency Department; IVYY = Interrupting Violence in Youth and Young Adults; IBH = Integrated Behavioral Health; TRC = Trauma Recovery Center; CM = case management

are eligible for supplemental mental health services if psychological symptoms persist or trauma-focused treatment has not been completed.

Adaptations to original TRC model and site-specific considerations

While largely adhering to the original TRC model implemented in San Francisco (see Wiggall & Boccellari [33]), the Grady TRC was designed to allow for flexibility in addressing the unique needs of the Grady community. First, psychiatry services were embedded in the Grady TRC. Given the lack of available trauma-informed psychiatric services and in-house medication management, continuity of care between psychotherapy and psychiatry were crucial for this patient population. Second, the Grady TRC initially included an interdisciplinary team led by both a clinical director (board-certified psychologist; AP) and a medical director (board-certified psychiatrist; TH). The medical director allowed for enhanced inter-departmental care coordination efforts, and the clinical director co-led a trauma-focused clinical research program housed at the hospital, which enabled culturally responsive training content for clinicians that was evidence-based and informed by research within the patient population. Furthermore, the Grady TRC hired a data analyst (ID) and incorporated a strong internal data/medical record integration that enables robust data collection and analysis opportunities for program evaluation and monitoring. The Grady TRC program also values a rich training environment including social work interns and masters-level counseling students, which simultaneously expands the capacity for available care to patients. The program is also well integrated with other hospital mental health and/or case management support programs.

Throughout *Implementation*, the Grady TRC working group and leadership team carefully considered how to reduce barriers to care among Grady's unique patient population, which primarily consists of Black individuals with few resources living in Atlanta. To address financial obstacles that might otherwise prevent engagement in care, the Grady TRC was structured to provide free psychotherapy and case management services, access to which is often limited due to economic challenges. Additionally, case management services were designed to assist trauma-exposed patients in navigating and accessing other essential resources, such as housing, employment support, and medical care, further mitigating the broader impact of financial insecurity on trauma recovery.

Several strategies were also implemented to reduce barriers to engagement related to systemic racism in medical care. The Grady TRC's approach also included a commitment to culturally responsive and traumainformed care models, ensuring that treatment plans were developed with sensitivity to historical and structural inequities that shape patients' experiences. This included ongoing professional development for TRC staff on racial trauma, implicit bias, and structural determinants of health, reinforcing an anti-racist framework in service delivery. The leadership team was intentional in recruiting TRC clinicians with demographic backgrounds representative of the Grady Memorial Hospital patient population to ensure the staff reflected the identities and lived experiences of the community served. Racial and gender concordance between clinicians and patients was also prioritized to foster trust [48] and enhance engagement [49], particularly for minoritized patients who may have experienced medical discrimination. Educational outreach was also conducted within the hospital; trainings and informational sessions about the TRC's services and its commitment to culturally responsive, trauma-informed care were provided to referring providers. These efforts helped to build referral pathways and reduce potential biases that might otherwise contribute to disparities in who is directed to specialized trauma services.

Changes in capacity and resources across time

The number of clinical staff grew steadily over the grant's first three years to reach the planned capacity of seven full-time clinicians. Based on increased capacity to serve more patients, inclusion criteria were adapted across the course of the program (see Table 1 for the adoption and exansion timeline). During the initial roll-out of services, qualifying trauma categories included violent crime (e.g., human trafficking, domestic violence, sexual assault, physical assault, gunshot wounds) and individuals had to be aged 18 years or older to receive services. Over time, inclusion criteria were expanded to include other mechanisms of injury (i.e., motor vehicle accidents, stabbings, burns) and age groups (i.e., adolescents, children). Further, a bilingual clinician was hired to better serve Spanish-speaking patients. In addition, at the request of the hospital's rape crisis center, the Grady TRC no longer considered county of residence an inclusion criterion when a survivor was referred by the hospital's rape crisis center.

Reach

As of September 30, 2023, 3,271 eligibility screenings were completed on the EHRs of 3,238 patients (i.e., 32 patients were screened multiple times during the study window). Eligibility screenings were conducted after charts came to the attention of Grady TRC clinicians. Based on EHR chart review, 47.3% of screened patients (n=1,533) were deemed ineligible for TRC services (in 47.0% [n=1,538] cases of eligibility screening) for one or more reasons (see Table 2 for referral source information and exclusion reasons), while 52.9% (n=1,712) were eligible for services (in 53.0% [n=1,733] of cases). Background interviews were completed with 432 eligible patients (25.2%). Of these, 70.1% (n=303) were interested

in and eligible for the full TRC model, consisting of both psychological and case management services.

Intake assessments were completed with 95.0% (n = 288) of eligible and interested patients (See Table 3 for patients' psychological symptom endorsement at intake assessment). Patients who completed intakes were predominately Black/African American (84.4%, n = 243) and female (58.3%, n = 168) with a mean age of 33.52 years (SD = 11.23). The most common trauma categories were gunshot wounds (47.1%, n = 129), domestic violence (13.9%, *n* = 38), and sexual assault (16.8%, *n* = 46). See Table 4 for demographic characteristics of patients who completed intake assessments. PTSD symptoms were common, as evidenced by a mean PCL-5 score of 43.56 (SD = 18.07) and 68.1% screening positive for probable PTSD (n = 196). On average, anxiety (M = 13.08; SD = 6.10) and depression (M = 14.19; SD = 6.54) symptom scores were in the moderate range; almost half of patients endorsed anxiety (44.8%, n = 129) within the severe range, and almost one-quarter endorsed depressive (23.6%, n = 68) symptoms within the severe range. Patients predominately endorsed no (32.6%, n = 94) or low-risk (45.5%, n = 131) levels of alcohol consumption (M = 3.85, SD = 5.95) and no (17.7%, n = 51) or low (56.9%, n = 51)n = 164) levels of drug use (M = 1.64; SD = 1.71).

At intake, female patients reported higher PTSD, t(268) = -1.71, p = .044, and depressive, t(268) = -1.77, p=.039, symptoms than male patients, while male patients reported higher drug use, t(260) = 1.87, p = .031, than female patients. Anxiety symptoms, t(268) = -0.66, p=.255, and alcohol consumption, t(267)=0.96, p=.17, did not differ by sex. No significant differences in psychological symptoms were found by trauma type among primary victims, Fs(5,246-249) = 0.74-1.04, ps = 0.39-0.78, although differences in alcohol consumption were trending towards significance, F(5,248) = 2.17, p = .058. Those who experienced physical assaults (M = 6.26, SD = 7.70) endorsed greater alcohol consumption than those who experienced motor vehicle accidents (M = 1.93, SD = 2.21, p=.018) and gunshot wounds (M=3.13, SD=4.87, p =.006). Psychological symptom severity did not differ by race, ts(229-237) = -0.31 - -1.12, ps = 0.13 - 0.38, or age at intake, rs = -0.04-0.02, ps = 0.53-0.82. See Table 5 for psychological symptoms by sex, race, trauma category, and age.

Discussion

This study used the RE-AIM framework [30, 31] to evaluate the *Adoption, Implementation,* and *Reach* of the first TRC located in the southeastern United States: the Grady TRC. Given the needs of Grady Health System's multiply marginalized patient population, *Adoption* of the TRC model was prioritized to provide wraparound services to survivors of interpersonal violence who are unlikely

Date	Milestones/Events	Eligibility	Referral Sources	Team
Oct 2020	Program Launch	Survivors of gunshot wounds, domestic violence, sexual assault, human trafficking are eligible for TRC services; Individuals must be 18 years or older and live in Fulton/Dekalb County	Emergency Department Track Board	TRC supervisor, 3 clinicians (Clinicians A, B, and C), and data analyst
May 2021	Clinical and Organizational Capacity Strengthened			New/Current TRC Supervisor onboarded
	Partnerships Expanded		Referrals to Grady Nia Project and Grady Trauma Project added	
Aug 2021	TRC Launch in Grady Health System EHR		Provider consultation and primary care clinic added	
	Clinical Capacity Strengthened			Interns added to the clinical team
Sept 2021	Clinical Capacity Strengthened			Clinician D onboarded
Oct 2021	Eligibility Expanded	Survivors of physical assault become eligible for TRC services		
Nov 2021	Eligibility and Referral Sources Expanded	Survivors of motor vehicle trauma become eligible for TRC services	Internal partners: 10 Park Place, inte- grated behavioral health, and Interrupt- ing Violence in Youth and Young Adults (IVYY)	
Jan 2022	Clinical Capacity Strengthened			Clinician E (bilingual) onboarded
Mar 2022	Clinical Capacity Strengthened			Clinician F onboarded
Apr 2022	Eligibility Expanded	Survivors of stabbing become eligible for TRC services		
	Clinical Capacity Strengthened			Art therapist onboarded
May 2022	Eligibility and Referral Sources Expanded	Individuals aged 13–17 years become eligible for TRC services	External partners	
Jun 2022	Eligibility Expanded	All violent trauma categories become eligible		
Oct 2022	Eligibility Expanded	All survivors referred from Rape Crisis Center become eligible regard- less of county of residence	Internal partner: Rape Crisis Center	
Nov 2022	Eligibility Expanded	Individuals aged 5 years and older become eligible for TRC services		
April 2023	Clinical and Organizational Capacity Strengthened			Clinician D promoted to TRC lead supervisors

 Table 1
 Grady TRC adoption and expansion timeline

Table 2 Reasons for Grady TRC service exclusion (n = 3,271 instances of seeking medical care)

Variable	n	%
Referral Source		
Hospital admission (Emergency Department Track Board)	1262	38.6
Provider consultation orders in the EHR	773	23.6
Internal partners within the hospital system	242	7.5
External community partners	33	1.0
Referral source data unavailable due to changes in data collection procedures	961	29.4
Eligibility Screening	3271	
Cases Ineligible for TRC services	1538	47.0
Address outside of Fulton/DeKalb counties	1138	59.6
Lack of exposure to a violent crime in past three years	601	31.5
Needed higher level of care	119	6.2
Chart lacked a source of trauma exposure	29	1.5
Age younger than five years	21	1.1
Cases Eligible for TRC services at Chart Review	1733	53.0
Patient completed background interview [*]	432	
Patient interested in (and eligible for) both psychological and case management services	303	70.1
Patient completed intake assessment	288	66.6
Patient interested in full TRC model but difficulty contacting victim/service refusal	114	26.3
Patient interested in full TRC model but services not required	8	1.9
Patient interested in case management services only	4	0.9
Patient interested in full TRC model but inability to meet victims' needs	1	0.2
Patient not interested in services	2	0.5
Unable to be contacted after three attempts	409	23.6
Refused services	355	20.5
Placed outside of jurisdiction	82	4.7
Did not attend appointment	74	4.3
Already enrolled in other services	41	2.4
Required care for serious mental illness	26	1.5
Received TRC services but did not complete intake assessment	8	0.6
Required care for substance use	6	0.3
Later died	5	0.3
Practical barriers	4	0.2
Post-screening data unavailable due to changes in data collection procedures	430	24.8

Full TRC model = psychological and case management services

*Values within "Patient completed background interview" section reflect number of patients, not cases, so associated percentages reflect number of patients in each subcategory out of those who completed the background interview; Sample sizes do not always sum across groups, since some patients had more than one eligibility screener (i.e., multiple hospital admissions and cases), and more than one reason for ineligibility could be marked at the eligibility screening and background interview stages

to receive trauma-focused care otherwise. Thanks to its *Implementation* within Grady Memorial Hospital, the Grady TRC can respond to trauma-exposed patients even in the absence of acute physical trauma, decreasing the gap identified between medical and mental health care within healthcare settings.

In the *Adoption* and *Implementation* stages of the Grady TRC, support from hospital leadership and across disciplines involved was high. The TRC model provided a clear organizational structure, but it remained critical to tailor the Grady TRC to the unique needs of the Grady community and work within existing systems. For example, unlike Livingson et al.'s model [50], an intensive care unit stay was not required for Grady TRC eligibility, since this could preclude survivors from receiving needed

psychological or social services in the absence of physical injury. Including stakeholders from multiple relevant disciplines (e.g., emergency medicine, surgery, psychiatry) ensured complementary expertise, feasible integration into the hospital system, and reduced likelihood of "stepping-on-toes" of established programs. While not initially supported by the model or hospital leadership, a psychologist with substantial expertise in trauma assessment and treatment was included on the interdisciplinary team to ensure initial program implementation emphasized evidence-based practices; the inclusion of a psychologist was advocated for by numerous psychologists on steering committee yet administrative support remained mixed.

Variable	n	%	Min-Max	M	SD
Trauma Symptoms (PCL-5)	270		0.00-80.00	43.56	18.07
Probable PTSD (PCL≥33)	196	68.1			
PCL≤32	74	25.7			
Anxiety Symptoms (GAD-7)	270		0.00-21.00	13.08	6.10
Minimal (GAD-7=0-4)	26	9.0			
Mild (GAD-7=5-9)	57	19.8			
Moderate (GAD-7=10-14)	58	20.1			
Severe (GAD-7≥15)	129	44.8			
Difficulty Functioning			0.00-3.00	1.48	0.92
Depression Symptoms (PHQ-9)	270		0.00-27.00	14.19	6.54
Minimal (PHQ-9=0-4)	21	7.3			
Mild (PHQ-9=5-9)	48	16.7			
Moderate (PHQ-9=10-14)	70	24.3			
Moderately-Severe (PHQ-9 = 15–19)	63	21.9			
Severe (PHQ-9≥20)	68	23.6			
Drug Abuse Symptoms (DAST-10)	262		0.00-8.00	1.64	1.71
None (DAST-10=0)	51	17.7			
Low (DAST-10=1-2)	164	56.9			
Moderate (DAST-10=3-5)	33	11.5			
Substantial (DAST-10=6-8)	14	4.9			
Severe (DAST-10=9–10)	0	0.0			
Alcohol Use (AUDIT)	269		0.00-38.00	3.85	5.95
None (AUDIT=0)	94	32.6			
Low-Risk (AUDIT = 1–7)	131	45.5			
Hazardous/Harmful Use (AUDIT=8–14)	26	9.0			
Moderate-to-Severe AUD (AUDIT \geq 15)	18	6.3			

Table 3 Grady TRC patients' psychological symptoms at intake assessment

In addition to an interdisciplinary team of experts, adequate funding to support the Grady TRC was critical to its initial success. Initial funding was robust enough to allow for eligibility criteria expansion as the Grady TRC's capacity grew. For example, additional trauma types, such as motor vehicle accidents and stabbings, were considered eligible for TRC services once the program rolled out smoothly and capacity was demonstrated. Over time, the Grady TRC also considered children and adolescents eligible for services, given the capability of new clinicians with child-focused training backgrounds. The Grady TRC's eligibility criteria expanded to include sexual assault survivors referred by the hospital's rape crisis center, regardless of county of residence, to offset the rape crisis center's reduced capacity. However, eventual funding cuts resulted in the clinical director (psychologist) position being eliminated after program implementation. Additional funding cuts later led to the removal of the medical director (psychiatrist) role, which in turn, impacted the ability to provide medication management support within the Grady TRC. Further exploration of the impact of these losses and additional avenues to fill these care gaps is needed, as these facets were considered initial implementation strengths. The fluctuation in funding and ability to support core elements of the program also highlights the challenge of depending on grant funding to maintain critical programs like the Grady TRC.

As expected, there was a demonstrable need for the TRC model at Grady Memorial Hospital. The *Reach* of the Grady TRC was evidenced by the high volume of patients deemed eligible for TRC services, many of whom reported clinically significant PTSD, anxiety, and depression symptoms. Notably, risk for trauma-related symptoms varied by patient sex. In line with recent research, female patients reported significantly higher PTSD [51] and depression [52] symptoms at intake than male patients, while male patients reported greater drug use [53]. Increasing providers' awareness of potential sexrelated symptom differences may encourage resource provision to at-risk patients, regardless of screening status, and help normalize patients' trauma-related symptoms.

Despite assertive outreach efforts, the Grady TRC team was unable to contact many eligible patients, with likely contributors being the high rates of poverty and limited access to resources among Grady patients. For example, many had unstable housing and disconnected phones when contact was attempted. When eligible patients were reached, many refused the services offered, perhaps due to reluctance to seek care from a system steeped in

Table 4	Characteristics	of patients	who completed	d intake
assessme	ents, <i>n</i> = 288			

Variable	Intake Assessments	
	n	%
Race		
Black/African American	243	84.4
White	17	5.9
Hispanic	8	2.8
Multiracial	3	1.0
Asian	2	0.7
Other	1	0.3
Missing	14	4.8
Sex		
Female	168	58.3
Male	112	38.9
Missing	8	2.8
Limited English Proficiency		
No	268	93.1
Yes	12	4.2
Missing	8	2.8
Sexual Orientation		
Heterosexual	229	79.5
Gay/Lesbian	19	6.6
Bisexual	18	6.2
Queer	3	1.0
Unsure/Questioning	2	0.7
Missing	17	5.9
Housing Status		
Stable (i.e., residence for ≥6mo.)	221	76.7
Unstable (i.e., moves more than	41	14.2
2x/yr, hotel, etc.)		
Homeless (i.e., shelter, streets, car)	13	4.5
Other	5	1.7
Missing	8	2.8
Secondary/Primary Victim Status		
Direct/Primary	274	95.1
Indirect/Secondary (i.e., survivors of	14	4.9
homicide victims)		
Primary Victims' Trauma Category		
Gunshot wound	129	47.1
Sexual assault	46	16.8
Domestic violence	38	13.9
Physical assault	34	12.4
Motor vehicle collision	17	6.2
Stabbing	9	3.3
Burns	1	0.4
Age (years)	M=33.52, SD=11.23,	
	Range = 16–79	

systemic oppression and racism [54]. Other barriers to engagement in Grady TRC services may include high levels of mental health stigma found within Black communities [55] and practical concerns, such as lack of transportation or childcare options. Service initiation rates may benefit from tailored outreach and follow-up methods, and additional work is needed to determine specific barriers to engaging with the Grady TRC's services.

The Grady TRC has quickly become a first-line response for psychotherapy and case management services for patients exposed to interpersonal violence in the Atlanta community. Following the lead of the UC San Francisco TRC, the Grady TRC uses a 3-stage model of individual therapy [56] that prioritizes stabilization, meaning making, and reconnection [57] via evidencebased psychotherapies (see Wiggall & Boccellari [33] for more information on the psychotherapy model used). Trauma-focused interventions most often used at the Grady TRC include EMDR [47, 58] and WET [45] for adult clients as well as TF-CBT [43, 44], play therapy [59], and sand tray therapy [60] for child clients. The Grady TRC's approach primarily relies on manualized, evidence-based exposure therapies but offers clinicians and clients the flexibility to engage in supportive care and expand beyond 16 sessions, as needed. Further, many patients served through the Grady TRC experience houselessness, joblessness, and food insecurity, highlighting the necessity of case management services. The Grady TRC has partnered with numerous local nonprofit organizations (e.g., shelters, childcare centers, legal and disability services) to better meet patients' social service needs. The Grady TRC has also partnered with organizations that help patients obtain vital documents, emergency food and clothing supplies, and job skills/readiness support. Developing and sustaining partnerships with community organizations is an ongoing and evolving process that is a major focus of the team.

This study is not without limitations. First, psychological symptoms were assessed using self-report questionnaires. Although most studies use a PCL-5 cut-score between 31 and 33 [61], the best cut-score for traumaexposed patients seeking care from a TRC in a safety net hospital remains unknown. Second, because data collection practices evolved across TRC implementation, a proportion of data regarding referral source and status after eligibility screening are missing. Also related to data collection and analysis, we were only able to examine whether psychological symptoms varied between Black/ African American and White patients, since cell sizes of those who identified as other races were too small for analysis. Because research suggests that those who are racially minoritized are at increased risk for poor outcomes following trauma exposure [62], examining symptoms across racial/ethnic identities will be important in future research. Third, many eligible patients were unable to be contacted after their charts were screened; future efforts to engage eligible patients in TRC services may benefit from creative adjustments to the flow of eligibility screenings, background interviews, and intake assessments. Last, this study does not address the *Effectiveness*

Table 5 Psychological symptoms endorsed at intake assessment by patient sex, race, trauma category, an	id age
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Variable	t or F	df	м	SD	r _{age}
Trauma Symptoms (PCL-5)					- 0.04
Sex	-1.71*	268			
Male $(n = 111)$			41.32	17.70	
Female (<i>n</i> = 159)			45.13	18.21	
Race	-0.45 p=.326	237			
Black (n = 223)	p 10 - 0		44.04	17.91	
White $(n = 16)$			41.94	18.97	
Trauma Category (Primary Victims)	1.04 p=.392	5, 249			
Gunshot wound ($n = 120$)	,		42.27	17.92	
Domestic violence ($n = 36$)			43.17	17.54	
Sexual assault ($n = 41$)			48.85	17.07	
Physical assault ($n = 34$)			43.68	19.15	
Motor vehicle accident ($n = 15$)			39.87	21.94	
Stabbing $(n=9)$			47.56	14.17	
Anxiety Symptoms (GAD-7)					-0.01
Sex	-0.66 p = .255	268			
Male (n = 111)	P		12.78	6.10	
Female $(n = 159)$			13.28	6.11	
Race	-1.12 p=.132	237			
Black (n = 223)	F		13.30	5.95	
White $(n = 16)$			11.56	6.63	
Trauma Category (Primary Victims)	0.74 p=.591	5, 249			
Gunshot wound ($n = 120$)	F		12.95	6.26	
Domestic violence ($n = 36$)			13.31	5.48	
Sexual assault ($n = 41$)			12.56	5.51	
Physical assault $(n = 34)$			13.91	5.93	
Motor vehicle accident ($n = 15$)			11.60	7.89	
Stabbing $(n=9)$			15.78	4.92	
Depression Symptoms (PHQ-9)					-0.02
Sex	-1.77*	268			
Male $(n = 111)$			13.35	6.49	
Female $(n = 159)$			14.78	6.54	
Race	-0.70 p = .244	237			
Black ($n = 223$)	,		14.18	6.59	
White $(n = 16)$			13.00	5.92	
Trauma Category (Primary Victims)	0.50 p=.778	5, 249			
Gunshot wound ($n = 120$)	,		13.96	6.43	
Domestic violence $(n = 36)$			14.42	5.75	
Sexual assault ($n = 41$)			14.24	6.60	
Physical assault $(n = 34)$			14.65	7.11	
Motor vehicle accident ($n = 15$)			13.20	8.27	
Stabbing $(n=9)$			17.11	5.30	
Drug Abuse Symptoms (DAST-10)					-0.03
Sex	1.87*	260			
Male (<i>n</i> = 110)			1.87	1.88	
Female (<i>n</i> = 152)			1.47	1.56	

Table 5 (continued)

Variable	t or F	df	М	SD	r _{age}
Race	-0.81	229			
	p=.210				
Black (n=215)			1.67	1.72	
White $(n = 16)$			1.31	1.08	
Trauma Category (Primary Victims)	1.04 p=.397	5, 241			
Gunshot wound ($n = 119$)			1.76	1.81	
Domestic violence ($n = 35$)			1.31	1.57	
Sexual assault ($n = 40$)			1.30	1.34	
Physical assault ($n = 30$)			1.97	1.56	
Motor vehicle accident ($n = 14$)			1.71	1.68	
Stabbing $(n=9)$			1.33	1.50	
Alcohol Use (AUDIT)					0.02
Sex	0.96	267			
$M_{2} = (n - 111)$	<i>p</i> =.170		4.26	612	
Female $(n - 158)$			3.56	5.82	
Paco	_0.31	236	5.50	5.02	
nace	p = .379	250			
Black (n = 222)			3.91	6.10	
White $(n = 16)$			3.44	4.10	
Trauma Category (Primary Victims)	2.17 p=.058	5, 248			
Gunshot wound ($n = 120$)			3.13 ^a	4.87	
Domestic violence ($n = 36$)			3.83	7.25	
Sexual assault ($n = 40$)			4.93	6.44	
Physical assault ($n = 34$)			6.26 ^b	7.70	
Motor vehicle accident ($n = 15$)			1.93 ^a	2.22	
Stabbing $(n=9)$			2.89	4.68	

*p<.05; trauma categories with different superscript (e.g., ^a, ^b) have statistically different group means (e.g., physical assault vs. motor vehicle collision and gunshot wound)

or *Maintenance* components of the RE-AIM framework, meaning additional studies examining the Grady TRC's impact on enrolled patients' psychological outcomes and perspectives of service quality and satisfaction (*Effectiveness*) or hospital-wide practices (*Maintenance*) are warranted.

Conclusion

This paper explored the *Adoption, Implementation* and *Reach* of the Grady TRC, and how the program, the first of its kind in the southeastern United States, fills a critical gap in mental health and social services for a multiply marginalized population. Prior to the TRC's integration into Grady Memorial Hospital, comprehensive victim services were not available to violence survivors seeking care. This paper serves as an exploration of how TRC models can be replicated across additional regions of the United States and highlights the importance of identifying specific barriers to care, such as those found in the Grady TRC program. Despite these barriers, the necessity of the *Adoption* and *Implementation* and the impact of the *Reach* of the Grady TRC were evidenced by the

multitude of patients that were eligible and connected to perhaps previously inaccessible services. The Grady TRC will continue to build and adapt to the needs of its multiply marginalized patients to ensure that all interpersonal violence survivors in the Atlanta area receive high quality, trauma-informed mental health and social services.

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

ECL, CRH, and AP wrote the introduction, methods, and discussion manuscript text. ECL and ID wrote the results sections. All authors reviewed the manuscript, and TH edited written text.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All study procedures were approved by the Emory University Institutional Review Board (IRB) and Grady Research Oversight Committee; informed consent was waived by the IRB for secondary data analysis. This study was conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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