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Neighborhood Safety and Neighborhood Police Violence Are Associated with Psychological Distress among English- and Spanish-Speaking Transgender Women of Color in New York City: Finding from the TURNNT Cohort Study

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Abstract Transgender women of color (TWOC) experience high rates of police violence and victimization compared to other sexual and gender minority groups, as well as compared to other White transgender and cisgender women. While past studies have demonstrated how frequent police harassment is associated with higher psychological distress, the effect of neighborhood safety and neighborhood police violence on TWOC's mental health is rarely studied. In this study, we examine the association between neighborhood safety and neighborhood police violence with psychological distress among TWOC. Baseline self-reported data are from the TURNNT ("Trying to Understand Relationships, Networks and Neighborhoods among Transgender Woman of Color") Cohort Study (analytic $n = 303$). Recruitment for the study began September 2020 and ended November 2022. Eligibility criteria included being a TWOC, age

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18–55, English- or Spanish-speaking, and planning to reside in the New York City metropolitan area for at least 1 year. In multivariable analyses, neighborhood safety and neighborhood police violence were associated with psychological distress. For example, individuals who reported medium levels of neighborhood police violence had 1.15 [1.03, 1.28] times the odds of experiencing psychological distress compared to those who experienced low levels of neighborhood police violence. Our data suggest that neighborhood safety and neighborhood police violence were associated with increased psychological distress among TWOC. Policies and programs to address neighborhood police violence (such as body cameras and legal consequences for abusive officers) may improve mental health among TWOC.

Keywords Neighborhood safety · Neighborhood police violence · Psychological distress · Transgender women · Transgender women of color · Latina · Latinx · Black · African American · Multiracial

Background

Transgender women (TW) experience higher rates of psychological distress and other mental health problems compared to the general (i.e., non-sexual and gender minority) population in the United States and worldwide [1–3]. They are also known to face higher rates of contact with the police, violent altercations, and incarceration [1, 3–9]. Transgender women of color (TWOC) in particular face even higher rates of police violence and victimization compared to other sexual and gender minority groups, including when compared to other White transgender and cisgender women [5, 10]. Their overrepresentation in the criminal justice system has often been attributed to social and structural factors such as lower socioeconomic status, sex work involvement, housing instability, and interpersonal discrimination [11–14].

TW are more likely to have a higher number of sexual partners and be more involved in transactional sex, more so than men who have sex with men (MSM) [10, 15–20]. The precarious socioeconomic conditions faced by TW that often lead to engagement in transactional sexual encounters make them uniquely vulnerable to police encounters as the nature of their work is currently criminalized in the

US. While studies have highlighted the negative consequences of police harassment and criminal justice involvement among sexual and gender minorities (SGM), especially MSM populations, few studies focus specifically on SGM people of color [21–26], and past research has commonly combined TW with all other SGM groups, such as MSM, which can be highly problematic [10, 15–20]. As a result, no work that we are aware of has examined associations between perceived neighborhood safety and neighborhood police violence with mental health among TWOC specifically.

Furthermore, while individual and interpersonal factors such as race/ethnicity, experiences of discrimination, and police encounters are all well-documented to be associated with a higher prevalence of mental health problems among SGM [23, 27–29], less attention has been given to contextual factors such as neighborhood-level safety and police violence, which is important in the context rising structural oppression. Neighborhoods with a higher number of Black individuals are more likely to be overpoliced and experience events of police violence including in New York City [30]. Black individuals being more likely to be surveilled and having more violent encounters with the police may explain their higher incarceration rates. As policing is a systemic issue and occurs at a population level, the effect should also be studied at a population level. Potential policy interventions that can improve policing for the community can only be done at a population level, and the effect of neighborhood safety and neighborhood police violence on TWOC's mental health is rarely studied, representing an important gap in the literature. Added to the fact that TWOC are often invisible in quantitative research due to being combined with MSM and other SGM populations, it is important to study the effect of neighborhood safety–related factors specifically among TWOC.

In this study, we study the association between perceived neighborhood safety and neighborhood police violence in relation to psychological distress among TWOC in the TURNNT ("Trying to Understand Relationships, Networks and Neighborhoods among Transgender Woman of Color") Cohort Study in New York City. In our study, we apply the Health Equity Research Production Model by including community members on the research as co-authors [31]. Given this, we approach this topic as a diverse set

of authors, including identities such as being Black, Latinx, Asian, queer, and transgender. We are people in public health and epidemiology as well as non-profit management and community advocacy, writing through our lens of our diverse identities. We hypothesize that perceived neighborhood safety and neighborhood police violence including such as experiences of harassment from police would be associated with increased psychological distress among TWOC, in part, due to structural racism. Because we utilize self-reported data for neighborhood safety exposure assessment and self-report of mental health, we expect to detect significant effects because neighborhood studies generally find strongest associations with data on perceptions of neighborhood characteristics [32].

Methods

Study Design

The Trying to Understand Neighborhoods and Networks among Transgender Women of Color (TURNNT) Cohort Study was designed in close collaboration with transgender women of color (TWOC) in New York City to examine how social and environmental factors affect the health and well-being of TWOC with a focus on HIV prevention and adherence. Community leaders and organizations who provide health, advocacy, social services, and other support to transgender women of color were involved in the development of the study. To facilitate ongoing feedback and collaboration, a Community Advisory Board was formed. Community Advisory Board members were provided an annual stipend and met with the study team quarterly to provide ongoing consultation on the design, implementation, analysis, interpretation, and dissemination of the surveys and other study requirements [33, 34]. In addition, a Scientific Advisory Board comprised of leaders in transgender health and HIV research met periodically to inform the study procedures.

Study Sample

The TURNNT cohort was fully initiated after a pilot period of in-person data collection ($n = 31$) from July 2019 to October 2019 [33, 34]. The study was re-launched to be conducted virtually in Fall 2020 due to the COVID-19 pandemic. In total, 314 TWOC were enrolled in a 1-year prospective longitudinal cohort study from August 2020 to November 2022. Eligible participants (1) identified as TWOC, (2) were between 18 and 55 years old at enrollment, and (3) lived and planned to live in the New York City metropolitan area (including northern New Jersey, Long Island, and the lower Hudson Valley) for the duration of the study for at least 1 year. Participants spoke either English or Spanish at enrollment. The study sample is comprised of both individuals living with and without HIV.

Recruitment

In line with methods used in past work with transgender women [35–37], participants for this study were recruited through a variety of methods, including (1) snowball sampling via referrals from enrolled participants, (2) social media marketing on Instagram, Facebook, and Twitter, (3) print advertising distributed at health service centers and venues, (4) event-based recruitment, and (5) referrals from organizational outreach and partnership. Interested individuals completed a screener on a dedicated study website (www.turnnt.com) by scanning a QR code which made it easier to navigate, in either English or Spanish, to assess eligibility and gather contact information for scheduling. Eligibility was confirmed via phone call, text, or email by study staff. Screener information and contact details were collected and managed using REDCap.

Procedure

The Spatial Epidemiology Lab at Columbia University Mailman School of Public Health utilized original surveys to assess the health and well-being of TWOC in New York City. At the initial enrollment interview, a consent form describing study background, requirements, timeline, confidentiality procedures, and participant rights was reviewed with interested individuals. Participants gave consent voluntarily by agreeing to the terms of the study and signing the consent form. Participants were also asked to sign an optional release of information form to allow for sharing of sexually transmitted infection (STI) and HIV testing information with the study

team. The study was approved by the Institutional Review Board at Columbia University Irving Medical Center (PT-AABQ1129).

Data were collected via six virtual quantitative interviews conducted over the video conferencing platform Zoom in three waves, each separated by approximately 6 months. Participants were invited to complete surveys during two visits at each study wave, in either English or Spanish. The first survey collected information on general health and well-being, socioeconomic characteristics, gender affirmation, social networks and social capital, neighborhood and housing characteristics, sexual health and behaviors, sex work, psychological well-being, substance use, sleep health, relationships, discrimination and violence, and experiences with the COVID-19 pandemic. The same survey was repeated at each wave, with additional questions on support systems, policing, vaccination, and medical mistrust at the 6-month and 12-month waves. The second survey at each wave collected information regarding travel to contextualize GPS data, as well as details on social and sexual networks. Study surveys were hosted using Qualtrics (Qualtrics, Provo, UT).

Between the first and second interview at each wave, participants carried global positioning system (GPS) devices (Qstarz BT-Q1000XT, manufactured by Qstarz International Co., Ltd., Taipei, Taiwan) over a 1-week period between the first and second interview at each wave. The devices recorded their latitude and longitude coordinates. The GPS device, a charging cable, and a labeled return envelope were mailed to participants after the first interview. Participants were instructed to charge the device frequently and to carry the device for 7 consecutive days (except when sleeping, swimming, or bathing, or when carrying the device would pose a danger to their safety, i.e., potentially during sex work). Participants were compensated with pre-paid gift cards as follows: $50 per interview at enrollment (wave 1), $75 per interview at the 6-month stage (wave 2), and $100 per interview at the 12-month stage (wave 3). Individuals who completed all six interviews and carried the GPS device at each wave received an additional $50 after their final study visit. Participants also received $25 for each referral who completed the first interview.

Participants who reported an unknown or negative HIV status completed a point-of-care OraQuick saliva HIV test at the second interview of each wave

in accordance with guidelines provided by the New York State Department of Health. Participants were mailed the HIV test along with the GPS device at the first interview, and instructed not to do the test until the second interview at each wave and completed the test over a video call with the interviewer. All participants with preliminary positive test results were immediately supported in accessing confirmatory blood testing with their primary care provider or with TURNNT partner organizations. For example, we contacted Callen-Lorde Community Health Center and Community Healthcare Network to provide immediate on-site testing. Participant arrived at time scheduled, received test results, and reported back to interviewer. Data for this analysis was collected and cleaned at each wave.

Measures

Neighborhood Safety

Participants were asked about their feelings of safety when walking alone outside during the day and night over the past 6 months. The questions were as follows: for daytime neighborhood safety, "… Thinking about your neighborhood, over the past six months how often did you feel safe when walking alone outside during the day? Would you say…?"; for nighttime neighborhood safety, "Thinking about your neighborhood, over the past six months how often did you feel safe when walking alone outside at night? Would you say…." Response options for both questions included "always," "most of the time," "sometimes", "rarely," and "never." Four items were utilized to measure perceived neighborhood safety [38]. We first combined the response categories of "always" and "most of the time" vs. "sometimes" vs. "rarely" and "never" for trichotomous analyses. For dichotomous analyses, we combined "always" and "most of the time" ("yes") vs. "sometimes," "rarely," and "never" ("no"). We created two combined variables to represent high safety and medium safety. For high safety, responses indicating safety during both daytime and nighttime were categorized as "yes," while responses indicating perceived unsafety during either timeframe were categorized as "no." For medium safety, responses indicating safety during either daytime or nighttime were categorized as "yes" with "no" indicating perceived unsafety during either daytime or nighttime.

Neighborhood Police Violence

We measured neighborhood police violence using two questions. First, we asked: "How much of a problem is excessive use of force by police in your neighborhood? Would you say…." Response options included the following: "a big problem," "somewhat of a problem," "not a problem," "prefer not to answer," "don't know" [39]. Second, we asked: "Thinking back over the past 6 months, how often did you experience:— Harassment, like slurs, physical harm, or prolong 'pat downs', from law enforcement such as police officers, security officials, transportation security administration?" Response options were as follows: "never," "sometimes," "most of the time," and "all or almost all of the time." For analysis purposes, we combined "most of the time" and "all or almost all of the time" for trichotomous analyses. For dichotomous analyses, we combined "sometimes," "most of the time," and "all or almost all of the time" vs. "never."

Psychological Distress

We measured psychological distress during the past 30 days using the Kessler Psychological Distress Scale (K10) [40, 41]. In line with past studies, we assessed psychological distress categorically for clinical relevance (scores ≥ 20). We also assessed moderate psychological distress (scores from 25 to 29) and severe psychological distress (scores from 30 to 50). The K10 scale involves 10 questions about emotional states each with a five-level response scale and has been validated internationally [40] with populations from Australia, France, Hong Kong, New Zealand, and South Africa, and among Native American communities, people who use injection drugs [42], military personnel, adolescents, and older adults; the K10 has also been validated for use in Dutch, French, Korean, Mandarin, Spanish, and Turkish [43]. Internal consistency reliability of the scale in our sample was 0.75.

Socio-Demographic Characteristics

Socio-demographic covariates included the following: age (18–24; 25–34; 35–44; ≥ 45); race/ethnicity (Black, Latina, Other); education (high school graduate/GED; less than high school; more than high school); income (no income; < $10,000;

$10,000–29,000; > $30,000); health insurance (no, yes for all 6 months, yes, for part of the 6 months); HIV status (positive, negative); sex work history (yes, no); incarceration history (no, never; yes, within the past 6 months; yes, but not within the past 6 months); and nativity (US-born, foreign-born).

Statistical Analysis

We had no missing for the outcome variable (Kessler-10; excluded in the analyses). For clinical relevance, we assessed psychological distress categorically (scores ≥ 20). Then, descriptive analyses were performed to characterize the socio-demographic composition of the study sample. Bivariable chi-squared analyses were performed to examine the differences between the non-psychologically distressed group and the psychologically distressed group regarding socio-demographic characteristics, neighborhood safety, and neighborhood police violence. A multivariable modified Poisson regression model (a Poisson regression with a robust error variance estimate) was used to estimate adjusted risk ratio (aRR) and 95% confidence intervals (CIs) describing associations between neighborhood safety and neighborhood police violence with psychological distress. Age, race/ethnicity, education, income, insurance, HIV status, sex work history, incarceration history, and nativity were included as covariates. Missing values were not included in the analyses. All statistical analyses were performed using Stata 18 (StataCorp, College Station, TX, USA).

Missing Data

There was missingness for certain covariates (i.e., age, income, living with HIV, sex work for money or goods, incarceration history, and nativity). Age had the lowest level of missingness with only 0.3% ($n = 1$) of data was missing, while 10% ($n = 31$) were missing income. Only 2.2% ($n = 7$) were missing living with HIV, and only 1.0% ($n = 3$) were missing for sex work for money or goods. Similarly, 1.0% ($n = 3$) were missing for incarceration history and 0.7% ($n = 2$) for nativity. For the exposure variables, 1.3% ($n = 4$) were missing for nighttime neighborhood safety and 0.7% ($n = 2$) were missing for neighborhood police violence. We conducted additional bivariable

analyses for covariates with more than 1% missingness (income level and living with HIV) to determine if the results differed when including missing data. However, no significant differences were found between income level, living with HIV, and psychological distress ($p = 0.894$ for income level; $p = 0.142$ for living with HIV).

Results

Table 1 shows descriptive statistics on our analytic sample ($n = 303$). Over 60% (60.1%) of our sample was 35 and older. Most of our participants were Latina (46.5%) or Black (28.1%). The "Other" category includes about 25% of our participants and includes biracial/multiracial (84.4%), Asians (7.8%), Middle Eastern/North African (2.6%), Guyanese (2.6%), Aboriginal (1.3%), and Native (1.3). Most participants completed high school (66.3%). The majority of participants earned less than $30,000, where 39.3% earned less than $10,000. Most participants reported having health insurance including for all 6 months (86.1%) and approximately even distribution of people living with HIV and vulnerable to HIV; almost three-fourths of participants reported sex work for money or goods. About half (50.2%) reported an incarceration history. Over half (57.4%) report being US-born.

The range of psychological distress scores in our analytic sample was 10 to 50 (mean, 22.95; median, 22.0; standard deviation, 8.44). Our analyses also show that 59.7% of the TURNNT population experiences psychological distress. 16.5% reported moderate psychological distress (K10 scores of 25–29) while 23.1% reported severe psychological distress (K10 scores ≥ 30). 32.7% and 57.4% report not feeling safe in the daytime and nighttime, respectively. 30.7% report police violence to be a problem in their neighborhood. 23.8% report experiencing harassment from law enforcement.

Association between Neighborhood Safety and Psychological Distress

In multivariable analyses, compared to those who report feeling safe or somewhat safe, those who report not feeling safe in the daytime had 1.11 (1.02, 1.22) times more likely of experiencing poor psychological distress (Fig. 1). Compared to those who report feeling safe or somewhat safe, those who report not feeling safe in the nighttime had a 1.09 (1.00, 1.20) more likely to experience poor psychological distress. Compared to those who report feeling safe (always or most of the time) in the nighttime, those who report not feeling safe (sometimes, rarely, and never) in the nighttime had 1.09 (1.01, 1.18) times more likely of experiencing poor psychological distress. Additionally, compared to those who report feeling safe both at daytime and at nighttime (high safety), individuals who report feeling unsafe during either the daytime or nighttime were 1.10 (1.01, 1.19) times more likely to experience high psychological distress. However, no significant results were found between medium safety and psychological distress.

Association between Neighborhood Police Violence and Psychological Distress

In multivariable analyses, individuals who reported medium levels of neighborhood police violence had 1.15 [1.03, 1.28] times the odds of experiencing psychological distress compared to those who experienced low levels of neighborhood police violence. Individuals who reported sometimes experiencing harassment from law enforcement in the past 6 months were more likely to experience psychological distress compared to those who never experienced harassment from law enforcement in the past 6 months (Fig. 2).

Discussion

We contribute to the research scholarship by assessing the effects of neighborhood factors on the mental health of transgender women of color (TWOC), an understudied population. This study is the first to have examined the association between neighborhood safety and neighborhood police violence with psychological distress among TWOC. In our study among TWOC in New York City in the TURNNT cohort, we show that 60% of the participants experience psychological distress, and one-third and over half report not feeling safe in the daytime and nighttime, respectively. In addition, nearly one-third report police violence to be a problem in their neighborhood, and one-quarter report experiencing

Table 1 Socio-demographic characteristics, neighborhood safety, neighborhood police violence, and psychological distress among transwomen of color in New York City, the TURNNT Cohort Study ($N = 303$)

	Total, N (%)	Not psychologically distressed, $n = 122$	Psychologically distressed, $n = 181$	p-values[a]
Socio-demographics				
Age				
18–24	32 (10.6)	10 (8.2)	22 (12.2)	0.597
25–34	88 (29.0)	39 (32.0)	49 (27.1)	
35–44	117 (38.6)	45 (36.9)	72 (39.8)	
≥45	66 (21.5)	27 (22.1)	38 (21.0)	
Race/ethnicity				
Black	85 (28.1)	39 (32.0)	46 (25.4)	**0.049**
Latina	141 (46.5)	61 (50.0)	80 (44.2)	
Other*	77 (25.4)	22 (18.0)	55 (30.4)	
Education				
Less than HS	102 (33.7)	38 (31.2)	64 (35.4)	0.302
High school graduate/GED	87 (28.7)	41 (33.6)	46 (25.4)	
More than HS	114 (37.6)	43 (35.3)	71 (39.2)	
Income				
No income	51 (16.8)	23 (18.9)	28 (15.5)	0.805
$1–9999	119 (39.3)	46 (37.7)	73 (40.3)	
$10,000–29,999	68 (22.4)	25 (20.5)	43 (23.8)	
$30,000–49,999	21 (6.9)	10 (8.2)	11 (6.1)	
$50,000 or more	13 (4.3)	6 (4.9)	7 (3.9)	
Health insurance				
No	27 (8.9)	7 (5.7)	20 (11.1)	**0.003**
Yes, for part of the 6 months	15 (5.0)	1 (0.8)	14 (7.7)	
Yes, for all 6 months	261 (86.1)	114 (93.4)	147 (81.2)	
Living with HIV				
Yes	157 (51.8)	70 (57.4)	87 (48.1)	0.168
No	139 (45.9)	51 (41.8)	88 (48.6)	
Sex work for money or goods				
Yes	226 (74.6)	83 (68.0)	143 (79.0)	**0.043**
No	74 (24.4)	37 (30.3)	37 (20.4)	
Incarceration history				
Yes	152 (50.2)	54 (44.3)	98 (54.1)	0.066
No	148 (48.8)	68 (55.7)	80 (44.2)	
Nativity (US-born)				
Yes	174 (57.4)	79 (64.8)	95 (52.5)	**0.031**
No	127 (41.9)	42 (34.4)	85 (47.0)	
Don't know	2 (0.7)	1 (0.8)	1 (0.6)	
Neighborhood safety				
Daytime neighborhood safety				
Always feel safe	122 (40.3)	61 (50.0)	61 (33.7)	**0.035**
Most of the time feel safe	82 (27.1)	32 (26.2)	50 (27.6)	
Sometimes feel safe	56 (18.5)	18 (14.8)	38 (21.0)	
Rarely feel safe	29 (9.6)	7 (5.7)	22 (12.2)	
Never feel safe	14 (4.6)	4 (3.3)	10 (5.5)	

Table 1 (continued)

	Total, N (%)	Not psychologically distressed, $n=122$	Psychologically distressed, $n=181$	p-values[a]
Nighttime neighborhood safety				
Don't know	4 (1.3)	1 (0.8)	3 (1.7)	**0.003**
Always feel safe	64 (21.1)	36 (29.5)	28 (15.5)	
Most of the time feel safe	61 (20.1)	30 (24.6)	31 (17.1)	
Sometimes feel safe	79 (26.1)	24 (20.0)	55 (30.4)	
Rarely feel safe	49 (16.2)	19 (15.6)	30 (16.6)	
Never feel safe	46 (15.2)	12 (9.8)	34 (18.8)	
Neighborhood police violence				
Neighborhood police violence				
A big problem	40 (13.2)	13 (10.7)	27 (14.9)	0.087
Somewhat of a problem	53 (17.5)	15 (12.3)	38 (21.0)	
Not a problem	94 (31.0)	45 (36.9)	49 (27.1)	
Don't know	114 (37.6)	48 (39.3)	66 (36.5)	
Prefer not to answer	2 (0.7)	1 (0.8)	1 (0.6)	
Experience of harassment from law enforcement in the past 6 months				
Never	231 (76.2)	104 (85.3)	127 (70.2)	**0.013**
Sometimes	57 (18.8)	14 (11.5)	43 (23.8)	
Most of the time	12 (4.0)	4 (3.3)	8 (4.4)	
All or almost all of the time	3 (1.0)	0 (0.0)	3 (1.7)	

Notes:

Not psychologically distressed (Kessler-10 < 20)

Psychologically distressed (Kessler-10 ≥ 20)

[*]Other predominantly includes biracial/multiracial (84.4%), Asian (7.8%), Middle Eastern/North African (2.6%), Guyanese (2.6%), Aboriginal (1.3%), and Native (1.3%) participants

[a]Chi-square test or exact test

harassment from law enforcement. In multivariable analyses, compared to those who report feeling safe or somewhat safe, those who report not feeling safe in the daytime were more likely to experience poor psychological distress. Compared to those who report feeling safe or somewhat safe, those who report not feeling safety in the nighttime were more likely to experience poor psychological distress. Individuals who reported medium levels of police harassment had an odds of experiencing psychological distress compared to those who experienced low levels of police harassment. Finally, individuals who reported sometimes experiencing harassment from law enforcement in the past 6 months were more likely to experience psychological distress compared to those who never experienced harassment from law enforcement in the past 6 months.

These findings align with findings from past research [9, 23, 44–49]. For example, the police harassment was independently associated with increases in mental health burdens in adjusted analyses among Black sexually minoritized men [23, 24]. Past research also shows that people who reported more police contact reported more trauma and anxiety symptoms, associations tied to how many stops they reported, the intrusiveness of the encounters, and their perceptions of police fairness [45]. Hence, there are several pathways by which neighborhood safety–related factors might be related to mental health among TWOC. Fear and stress are important potential mechanisms associated with neighborhood safety and neighborhood police violence that can initiate mental health issues as well as worsen pre-existing mental health issues. The pathophysiology of stress-related diseases linking the neighborhood context to mental health should be studied: Residing in an unsafe neighborhood, for example, including marked by neighborhood police violence, which is a
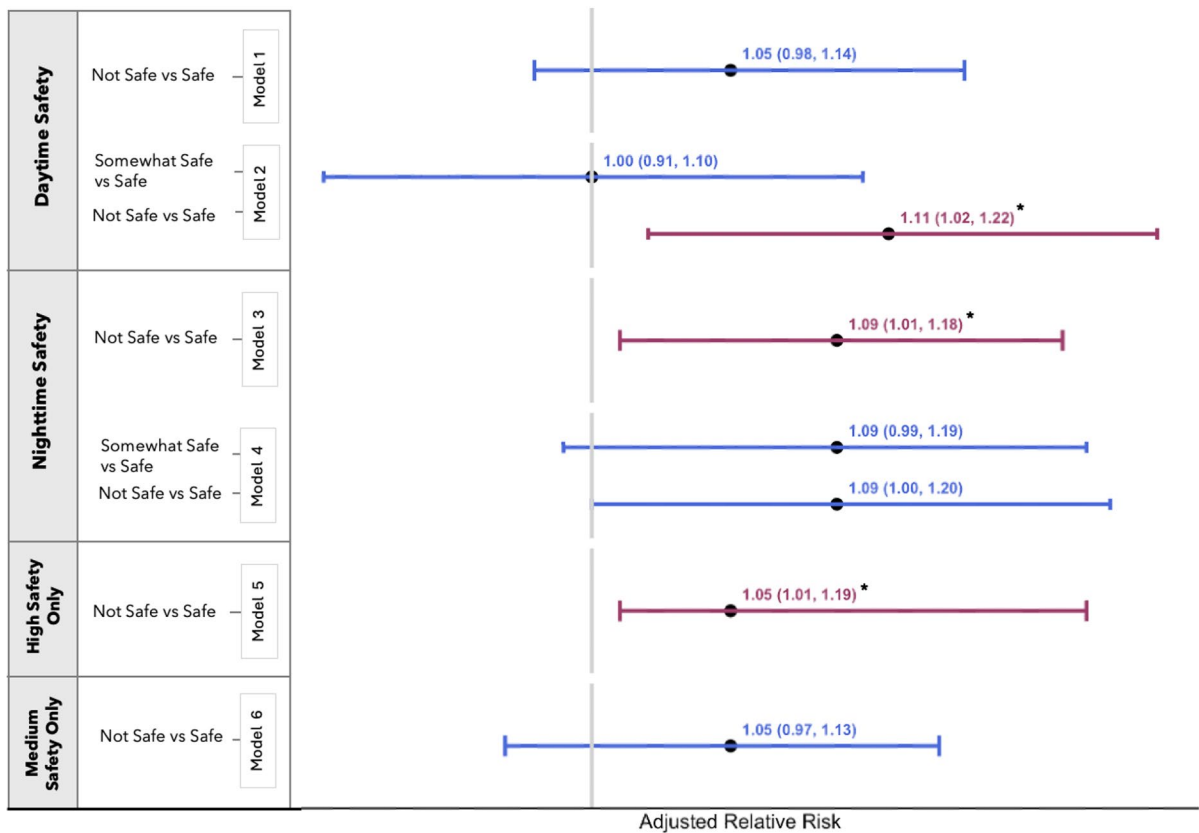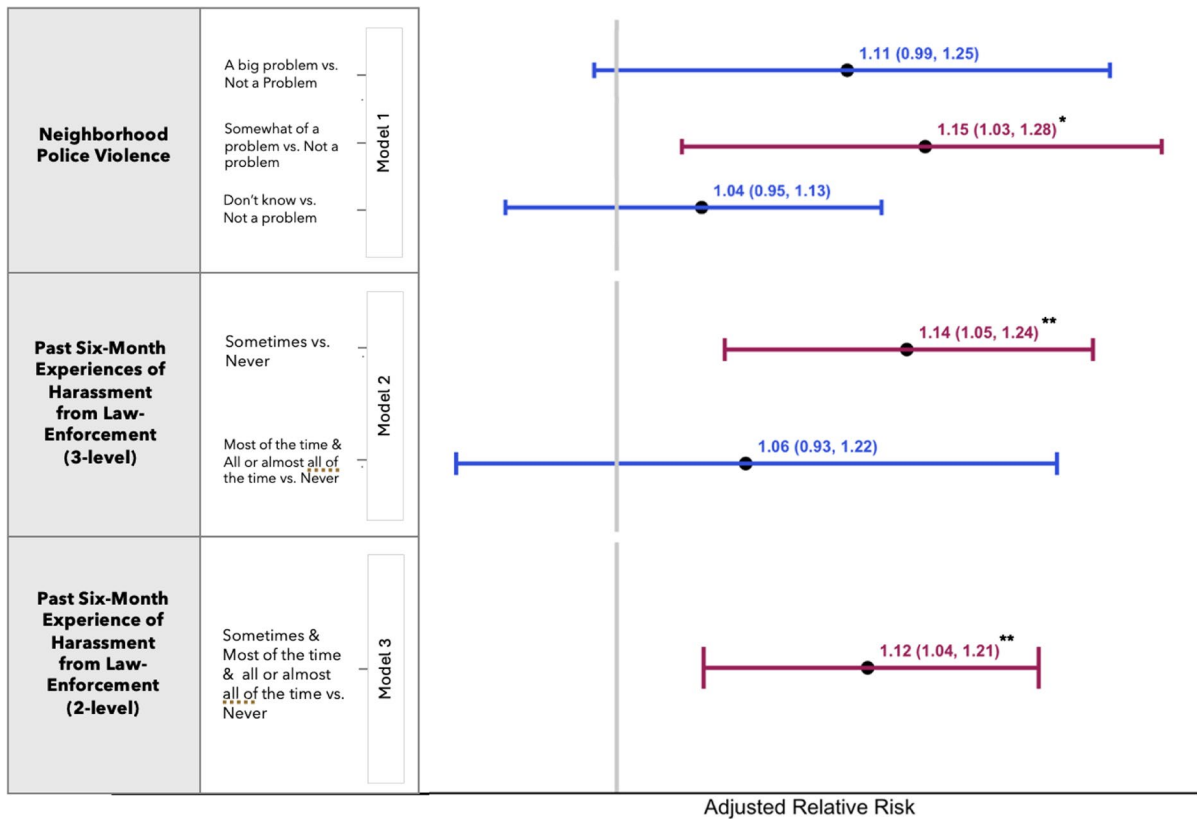
Fig. 1 Multivariable associations[a] between neighborhood safety and psychological distress among transwomen of color in New York City. ARR, adjusted relative risk; CI, confidence interval. High safety was calculated for those who responded that they feel safe both during daytime and nighttime. Medium safety was calculated for those who responded that they feel safe either during daytime or nighttime. [a]Adjusted for age, race/ethnicity, education, income, insurance, HIV status, sex work history, incarceration history, and nativity. *$p < 0.05$

potentially chronic traumatic stressor, has been associated with increased cortisol secretion [50]. Posttraumatic stress disorder has been associated with biological markers of stress such as inflammation [51, 52], which should be explored in future research.

Future Research

There is a need for additional research to clarify the role that neighborhood safety–related factors such as neighborhood police violence play in psychological distress and other mental health burdens in vulnerable populations, especially TWOC. First, we suggest data systems to continue document neighborhood safety–related factors including neighborhood police violence. The Trans Murder Monitoring (TMM) research project by Transgender Europe (TGEU) systematically monitors, collects, and analyzes reports of homicides of trans and gender diverse people worldwide, which can be an important system to be leveraged in the US. Mapping Police Violence is a project based on the US that documents police killings whether a firearm is used or not, which can also be leverage in future research with transgender populations. Second, in our study, we used a global survey measure of neighborhood safety, neighborhood police violence, and psychological distress, which, while the current field standard, may miss important nuances including daily variation. Assessing daily variation (e.g., via ecological momentary assessment [EMA]) and using objective measures of neighborhood safety–related factors (e.g., crime statistics) are

Fig. 2 Multivariable associations[a] between neighborhood policing and psychological distress among transwomen of color in New York City. ARR, adjusted relative risk; CI, con-fidence interval. [a]Adjusted for age, race/ethnicity, education, income, insurance, HIV status, sex work history, incarceration history, and nativity. *$p < 0.05$, **$p < 0.01$

important, including through global positioning systems (GPS) data collection. In future analyses, we will merge our TURNNT GPS data with local crime statistics, using spatial and multilevel analyses. Biological data such as on inflammation could be integrated into these protocols, including to understand effect mediation. In addition, psychological distress can be assessed clinically, and other measures of mental health can be included such as depression, anxiety, and mental health utilization. Researchers should also examine this association with prospective cohort designs, allowing for causal inference. Furthermore, experimental research, e.g., stepped wedge cluster randomized trials (e.g., where neighborhoods might be randomly assigned to an intervention that improves safety including from police) and natural experiments (e.g., new policies restricting police in certain neighborhoods to enhance safety such as via community-based policing) including in neighborhoods with a high proportion of TWOC, could be conducted (as they are the strongest evidence for temporality) to understand the effects of neighborhood safety–related factors on psychological distress among vulnerable populations like TWOC.

Limitations

This study has several limitations. First, the current analysis utilizes cross-sectional data. As such, no causal inferences can be made. In addition, residual confounding, as in all observational studies, may bias these results including previous police interaction and neighborhood covariates such as neighborhood-level race/ethnicity. Third, we assessed neighborhood police violence in part with the question: "Thinking back over the past 6 months, how often did you experience:—Harassment, like slurs, physical harm, or prolong 'pat downs', from law enforcement such

as police officers, security officials, transportation security administration?" We recognize that this item may not be specific to the neighborhood context, and TWOC sex workers, in particular, may experience police harassment outside of their neighborhood when they are working. Additionally, our sample may be vulnerable to selection bias due to convenience sampling methodology, and the results may not be generalizable: the majority of the participants in the TURNNT cohort are aged 35 and older, report having formal healthcare insurance, are current or former sex workers, and are living below the poverty level. It is also important to note that we had fewer participants who were Asian, Native Hawaiian/Pacific Islander, Native American, and Middle Eastern/Southwest Asian/North African despite our efforts to collaborate with and recruit transgender women from these groups. Additionally, our recruitment methods may not have reached those who did not engage with the transgender community and our study procedures required internet access to participate. Given these issues including the size of these subpopulations, the experiences of individuals in this sample may not be generalizable to all TWOC, all transgender women, or the overall population of New York City or the United States. Further, data on neighborhood safety–related factors and psychological distress were self-reported and therefore at risk of misclassification and same source bias, albeit using validated screening tools that are widely recognized across fields of research.

Implications for Research, Policy, and Practice

Data from our study suggest that neighborhood safety and neighborhood police violence were associated with increased psychological distress among TWOC. Policies and programs to address neighborhood safety and neighborhood police violence (such as body cameras and legal consequences for abusive officers) may also improve mental health among TWOC. Because many police murders of Black and brown people, including those of George Floyd, Eric Garner, Tyre Nichols, and Tortuguita, have happened on video and body cameras, policy reforms such as more comprehensive officer training, improved accountability measures, and stricter protocols focused on reducing and minimizing the effects of use of force policies

are recommendations that follow from our findings. This is notable because law enforcement agencies receiving Department of Justice funds must adhere to federal laws that bar discrimination, including sex-based and gender-based discrimination. Additionally, establishing transparent, community-led oversight committees can provide a necessary check on police activities, ensuring that the concerns of the TWOC community are directly addressed. Mental health support for TWOC should be prioritized, with increased funding for services that are sensitive to the specific needs of the community. Promoting dialog and collaboration between law enforcement and community stakeholders is crucial to build trust. Educational programs that focus on the history and impact of racial discrimination in law enforcement could be integral in fostering empathy and changing prejudiced attitudes within the police force.

Given the rise in structural oppression, our important findings point to possible policy reforms aimed at reducing violence and the harassment of racial, ethnic, and gender minorities by police officers. First, mandatory anti-discrimination training for police officers could address implicit bias and enhance understanding of SGM issues, including intersectional gender minority issues. This could be part of broader community policing initiatives that foster partnerships with SGM organizations, aiming to build trust and ensure that policing is inclusive and sensitive to minority needs. Second, police department practices and procedures must be revised to more effectively enforce policies that explicitly prohibit discrimination and harassment. This could be done by creating specialized crisis intervention teams trained in de-escalation and connection to appropriate support services for vulnerable groups. Third, enhancing reporting mechanisms and improving data collection on police interactions with SGM individuals can put in place accountability mechanisms to mitigate the negative effects that our study documents. Additionally, implementation criminal justice reforms including record relief and resentencing for vulnerable groups could reduce their overall and drug-related arrests. Lastly, engaging with the community through regular dialog, increasing recruitment of SGM individuals in law enforcement, and offering support services for harassment victims can further bridge gaps between police and minoritized communities.

Data Availability The data that support the findings of this study are available from the corresponding author [DTD], upon reasonable request.

Declarations

Ethical Approval and Consent to Participate At the initial enrollment interview, a consent form describing study background, requirements, timeline, confidentiality procedures, and participant rights was reviewed with interested individuals. Participants gave consent voluntarily by agreeing to the terms of the study and signing the consent form. Participants were also asked to sign an optional release of information form to allow for sharing of sexually transmitted infection (STI) and HIV testing information with the study team. The study was approved by the Institutional Review Board at Columbia University Irving Medical Center (PT-AABQ1129).

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