

Original research

Prevalence and correlates of workplace violence: descriptive results from the National Transgender Discrimination Survey

Idia Enogieru,¹ Ashley L. Blewitt-Golsch,² Lauren J. Hart,³ Sara LeGrand,² Kathryn Whetten,² Truls Ostbye,^{2,3} Candice Y. Johnson ³

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/oemed-2023-109197>).

¹Department of Health Policy and Management, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA

²Duke Global Health Institute, Duke University, Durham, North Carolina, USA

³Department of Family Medicine and Community Health, Duke University, Durham, North Carolina, USA

Correspondence to

Dr Candice Y. Johnson, Family Medicine and Community Health, Duke University, Durham, North Carolina, USA; candice.y.johnson@duke.edu

Received 14 September 2023

Accepted 1 March 2024

Published Online First

18 March 2024



© Author(s) (or their employer(s)) 2024. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Enogieru I, Blewitt-Golsch AL, Hart LJ, et al. *Occup Environ Med* 2024;**81**:178–183.

ABSTRACT

Objective To describe the lifetime prevalence of workplace harassment, physical violence and sexual assault against transgender and non-binary workers targeted due to their gender identity and to identify correlates of this workplace violence.

Methods This descriptive cross-sectional study used data from 4597 transgender or non-binary respondents from the 2008–2009 National Transgender Discrimination Survey. Respondents reported if they had ever experienced harassment, physical violence or sexual assault at work specifically because of their gender identity. We estimated the prevalence of each type of violence stratified by gender identity, race/ethnicity, age, educational attainment, history of working in the street economy (eg, sex industry, drug sales) and if people at work knew their gender identity.

Results Workplace violence was prevalent, with 50% of transgender and non-binary workers having ever experienced harassment, 7% physical violence and 6% sexual assault at work because of their gender identity. Harassment was common among all of these workers, but physical violence and sexual assault were more than twice as common among transfeminine and non-binary workers assigned male at birth, workers of colour, workers with low educational attainment and those who had ever worked in the street economy.

Conclusions Transgender and non-binary workers commonly face violence at work because of their gender identity. Workplace violence prevention programmes should incorporate ways to prevent gender identity-based violence and facilitate channels for workers to report the occurrence of discrimination and violence.

INTRODUCTION

The US Occupational Safety and Health Administration (OSHA) defines workplace violence as including acts or threats of physical violence, harassment and threatening behaviour at work.¹ Although OSHA has no specific standard addressing workplace violence, its General Duty Clause requires that employers provide a work environment safe from hazards that might cause serious harm, including a workplace free from violence.^{2,3}

In addition to its acute physical or mental effects, workplace violence is associated with an increased risk of long-term consequences including depression, post-traumatic stress disorder, poor sleep, cardiovascular disease and extended leave from

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Transgender and non-binary people experience discrimination and violence in everyday life, including in the workplace.

WHAT THIS STUDY ADDS

⇒ Harassment, physical violence and sexual assault due to gender identity is common among transgender and non-binary workers.
⇒ Physical violence and sexual assault are most prevalent among transfeminine workers, non-binary workers assigned male at birth, workers of colour, workers with low educational attainment and those who have worked in the street economy.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Workplace violence prevention programmes should address the prevention of gender identity-based workplace violence, including specific elements to support workers most at risk.

work.^{4–7} For employers, workplace violence can lead to reduced productivity, increased turnover and legal consequences.⁸ In the USA, an estimated 8 violent workplace crimes were reported per 1000 workers during the years 2007–2015, although this rate varied considerably by occupation; for example, workers in protective services occupations experienced workplace violence at rates over an order of magnitude higher (101 per 1000).⁹

Transgender and non-binary (TNB) people—those whose gender identity differs from their sex assigned at birth—experience high rates of violence in everyday life, including in the workplace.^{10–12} Each year, an estimated 15% of TNB workers are victims of workplace violence perpetrated specifically because of their gender identity.¹⁰ As a result of workplace violence and other forms of workplace discrimination, over three-quarters of TNB workers make efforts to avoid discrimination and violence at work by means such as hiding their gender identity, requesting a job transfer or quitting their job.¹⁰

An estimated 1.6% of US adults identify as TNB, with younger adults more likely to report being TNB (5.1% of those aged 18–29 years) than older

adults (0.3% of those aged 50 years or older).¹³ Among the estimated 150 million adults in the US civilian workforce, this could translate to approximately 2.4 million workers at risk for workplace violence perpetrated specifically against those with TNB gender identities.¹⁴ However, TNB workers are poorly represented in the occupational health literature, and we know little about these workers' experiences.

To better understand the occurrence of workplace violence against TNB workers, our objective was to estimate the lifetime prevalence of workplace harassment, physical violence or sexual assault perpetrated because of the worker's gender identity, and to identify correlates of such workplace violence.

METHODS

We used secondary data from the 2008–2009 National Transgender Discrimination Survey (NTDS), a study conducted by the National Center for Transgender Equality and the National Gay and Lesbian Task Force.¹⁵ People eligible to participate in NTDS identified as transgender or gender non-conforming (the terms used in the recruitment materials), were aged 18 years or older, and were residents of the 50 US states, District of Columbia, Puerto Rico, Guam, or the US Virgin Islands. To recruit participants, a link to the online survey was distributed to >800 transgender-serving community-based organisations and 150 community listservs. An additional 2000 paper surveys were distributed to organisations that serve rural, homeless and low-income transgender people to better reach populations without internet access. The survey—available in English and Spanish—focused on discrimination experienced in daily life, such as in employment, housing and healthcare.

Gender identity category was determined using questions on sex assigned at birth, gender identity (man, woman, part time one gender and part time another, gender not listed here) and how strongly respondents identified with a list of 15 terms related to gender identity (not at all, somewhat, strongly). More details are provided in the online supplemental materials. We used that information to classify respondents into one of four gender identity categories: transmasculine, transfeminine, non-binary assigned female at birth (AFAB) and non-binary assigned male at birth (AMAB) (online supplemental figure S1). We excluded people who fell outside these categories or who had incomplete data on gender identity. We selected these four gender identity categories to correspond to categories used in another large US survey of TNB people (transgender men, transgender women, non-binary AFAB, non-binary AMAB).¹⁰ We used the terms transmasculine and transfeminine because we could not reliably separate people with a binary transgender identity from those who held multiple identities. For example, transmasculine respondents would include those who identified solely as transgender men and also those who were assigned female at birth and identified both as transgender and as non-binary.

Information on workplace violence was collected with the question, "Because of being transgender/gender non-conforming, which of the following experiences have you had at work?" followed by a series of statements including "I was harassed by someone at work", "I was the victim of physical violence by someone at work" and "I was the victim of sexual assault by someone at work". Respondents could answer 'yes', 'no' or 'not applicable' to each statement. To exclude participants who likely never held a job, we excluded people who answered 'not applicable' to every question about workplace violence or who did not answer any of those questions.

We examined six variables as potential correlates of workplace violence against TNB people: gender identity (transmasculine, transfeminine, non-binary AFAB, non-binary AMAB); race/ethnicity (Hispanic or Latinx, non-Hispanic black, non-Hispanic white and all other non-Hispanic groups); age (18–24, 25–34, 35–44, 45–54 and 55 years and older); educational attainment (less than high school, high school, some college, college degree, graduate degree); ever worked for pay in the street economy (eg, sex work, drug sales) (yes, no) and how many people at their current job knew the respondent was TNB (none, some, most, not applicable). We included the 'not applicable' category for the last variable to capture respondents who were currently not working but worked in the past. Further details on how these variables were collected and defined for analysis are available in the online supplemental materials.

We estimated the prevalence of each type of workplace violence separately, and how the prevalence varied by each variable of interest. We used robust Poisson regression to estimate prevalence ratios (PR) and 95% CIs for associations between the variables of interest and each type of workplace violence. No covariates were included in the model because this was a descriptive study whose purpose was to illustrate differences between subgroups, not to assess causality.¹⁶ To examine the intersection between gender identity and race/ethnicity, we reported the prevalence of each type of workplace violence stratified by combinations of both variables. Results were not presented when estimates were based on fewer than five participants or if the sample size was too small for the model to run. Analyses were conducted in Stata V.17 (College Station, Texas, USA) and SAS V.9.4 (Cary, North Carolina, USA).

RESULTS

Of the 6456 people completing the NTDS survey, we included the 5861 (91%) classified into one of the four included gender identity groups. From that eligible population, we excluded 1264 (22%) people who marked 'not applicable' to all questions on workplace violence or who did not answer all of those questions. Our final analysis included 4597 respondents: 2153 transfeminine, 1258 transmasculine, 342 non-binary AMAB and 844 non-binary AFAB workers. Because some respondents did not answer all workplace violence questions, the number of people included in the analyses of each of the specific workplace violence outcomes differed.

Most participants were non-Hispanic white, in the 25–34 years age group and had at least some college education (table 1). Most respondents had worked only in the conventional economy; 17% of respondents had worked in the street economy at some point.

Half of the participants (50%) reported ever being harassed at work because of their gender identity (table 1). The prevalence of harassment was highest among those with less than high school education, those who had ever worked in the street economy and those who were likely currently not working (ie, answered 'not applicable' to the question asking if people in their current job knew that the respondent was transgender). Results for transmasculine and transfeminine workers (online supplemental table S1) and non-binary workers (online supplemental table S2) followed the same patterns.

In the NTDS population, 7% reported ever experiencing physical violence and 6% sexual assault at work because of their gender identity (table 2). The prevalence of both types of violence had similar patterns: both were more common among transfeminine and non-binary AMAB workers, workers of

Table 1 Lifetime prevalence of harassment at work because of gender identity, transgender and non-binary workers, NTDS, 2008–2009

	Total NTDS respondents	Harassment		
		N*	Prevalence (%)	PR (95% CI)
Full population	4597	4561	50	
Gender identity				
Transfeminine	2153	2132	52	1.1 (1.0 to 1.1)
Transmasculine	1258	1251	49	1.0 (ref)
Non-binary AMAB	342	337	47	1.0 (0.9 to 1.1)
Non-binary AFAB	844	841	49	1.0 (0.9 to 1.1)
Race/Ethnicity				
Non-Hispanic black	160	158	41	0.8 (0.7 to 1.0)
Non-Hispanic white	3535	3516	49	1.0 (ref)
Hispanic or Latinx	270	261	54	1.1 (1.0 to 1.2)
All other non-Hispanic	606	601	60	1.2 (1.1 to 1.3)
Missing	26	25		
Age (years)				
18–24	781	773	52	1.0 (ref)
25–34	1577	1570	51	1.0 (0.9 to 1.1)
35–44	809	801	53	1.0 (0.9 to 1.1)
45–54	705	704	52	1.0 (0.9 to 1.1)
55 or older	454	444	45	0.9 (0.8 to 1.0)
Missing	271	269		
Education				
Less than high school	119	118	62	1.3 (1.1 to 1.6)
High school	329	321	53	1.1 (1.0 to 1.3)
Some college	1825	1811	54	1.2 (1.1 to 1.3)
College degree	1322	1318	46	1.0 (ref)
Graduate degree	993	984	46	1.0 (0.9 to 1.1)
Missing	9	9		
Ever worked in street economy				
No	3752	3728	47	1.0 (ref)
Yes	785	773	65	1.4 (1.3 to 1.5)
Missing	60	60		
People at current job aware of gender identity				
None	920	911	39	1.0 (ref)
Some	1549	1538	51	1.3 (1.2 to 1.5)
Most	1649	1637	52	1.3 (1.2 to 1.5)
Not applicable†	447	443	64	1.7 (1.5 to 1.8)
Missing	32	32		

*Number of respondents who answered the question on workplace harassment.

†Likely indicates respondents who were currently not working but who worked in the past.

AFAB, assigned female at birth; AMAB, assigned male at birth; CI, confidence interval; NTDS, National Transgender Discrimination Survey; PR, prevalence ratio; ref, reference.

colour, younger workers, workers with less than a high school education, those who ever worked in the street economy and those who answered ‘not applicable’ to the question about people knowing the respondent’s gender identity at their current job (ie, they were likely currently not working). The prevalence of physical violence exceeded 15% among respondents with less than a high school education and those who ever worked in the street economy. The same patterns were evident among transmasculine and transfeminine workers (online supplemental table S1) and non-binary workers (online supplemental table S2), although the analysis for non-binary workers was limited by small sample size.

We then examined how the intersection of gender identity and race/ethnicity was associated with prevalence of the three types of workplace violence (table 3). Because of small sample sizes, we collapsed all workers aside from non-Hispanic white into a single category of ‘workers of colour’. Workers of colour were more likely to report all three types of workplace violence than non-Hispanic white workers. Differences were most evident for physical violence and sexual assault, for which transfeminine and non-binary AMAB workers of colour were more likely to experience these types of violence than transmasculine or non-binary AFAB workers.

DISCUSSION

A substantial proportion of TNB workers reported experiencing harassment, physical violence or sexual assault perpetrated because of their gender identity during their working lives. Our estimates did not include workplace violence from causes other than gender identity-based discrimination, meaning that the overall prevalence of workplace violence experienced by these workers was likely substantially higher.

A 2021 study also asked TNB respondents about their lifetime prevalence of workplace violence perpetrated due to their gender identity and found that 44% of respondents had been verbally harassed, 28% physically harassed and 26% sexually harassed at work at some point during their working lives.¹⁷ The types of workplace violence measured between our study and this more recent study differed, which meant we could not directly compare results. Past-year prevalence of workplace violence was collected in the 2015 US Transgender Survey. Among those who held a job within the past year, 14% were verbally harassed, 1% were physically assaulted and 1% were sexually assaulted at work within the past year because of their gender identity.¹⁰ Correlates of each type of workplace violence were not presented in that study, and we therefore could not determine whether correlates were similar for lifetime and past-year workplace violence. However, the present study and these prior studies demonstrate that workplace violence and harassment perpetrated because of a worker’s gender identity is a common occurrence among TNB workers. No study collected information on the frequency or duration of workplace violence, information that could provide a better picture of the extent that TNB workers experience workplace violence.

Transfeminine and non-binary AMAB workers of colour were the most likely to experience physical violence and sexual assault—this is consistent with findings that in the USA, black transgender women are at particularly high risk for violence due to the intersection of racism, sexism and transphobia.¹⁸ This result is similar to studies of all types of workplace violence (not only gender-identity based), where women are more likely to experience sexual assault at work than men; however, there are mixed results about if women or men are more likely to experience physical assault at work.^{9 19 20} Research on race and

Table 2 Lifetime prevalence of physical violence or sexual assault at work because of gender identity, transgender and non-binary workers, National Transgender Discrimination Survey, 2008–2009

	Physical violence			Sexual assault		
	N*	Prevalence (%)	PR (95% CI)	N*	Prevalence (%)	PR (95% CI)
Full population	4421	7		4419	6	
Gender identity						
Transfeminine	2070	9	2.3 (1.7 to 3.2)	2063	7	2.0 (1.4 to 2.8)
Transmasculine	1215	4	1.0 (ref)	1220	3	1.0 (ref)
Non-binary AMAB	326	9	2.5 (1.6 to 4.0)	326	9	2.7 (1.7 to 4.3)
Non-binary AFAB	810	5	1.3 (0.8 to 2.0)	810	5	1.4 (0.9 to 2.1)
Race/Ethnicity						
Non-Hispanic black	149	11	2.3 (1.4 to 3.7)	149	12	2.8 (1.8 to 4.5)
Non-Hispanic white	3409	5	1.0 (ref)	3407	4	1.0 (ref)
Hispanic or Latinx	259	15	3.0 (2.2 to 4.2)	260	13	3.1 (2.2 to 4.4)
All other non-Hispanic	580	11	2.1 (1.7 to 2.9)	579	9	2.1 (1.5 to 2.8)
Missing	24			24		
Age (years)						
18–24	762	8	1.0 (ref)	760	7	1.0 (ref)
25–34	1524	7	0.9 (0.7 to 1.2)	1524	6	0.9 (0.7 to 1.3)
35–44	764	6	0.8 (0.5 to 1.1)	765	5	0.8 (0.5 to 1.2)
45–54	679	7	1.0 (0.7 to 1.4)	679	4	0.7 (0.4 to 1.0)
55 or older	434	3	0.5 (0.3 to 0.8)	436	3	0.5 (0.3 to 0.9)
Missing	258			255		
Education						
Less than high school	110	22	5.6 (3.6 to 8.7)	109	17	4.1 (2.5 to 6.8)
High school	314	11	2.8 (1.8 to 4.2)	314	9	2.2 (1.4 to 3.5)
Some college	1743	8	2.0 (1.4 to 2.7)	1746	7	1.6 (1.2 to 2.3)
College degree	1279	4	1.0 (ref)	1276	4	1.0 (ref)
Graduate degree	966	5	1.2 (0.8 to 1.8)	965	4	0.9 (0.6 to 1.4)
Missing	9			9		
Ever worked in street economy						
No	3616	4	1.0 (ref)	3617	4	1.0 (ref)
Yes	750	16	3.7 (2.9 to 4.6)	746	14	3.8 (3.0 to 4.9)
Missing	55			56		
People at current job aware of gender identity						
None	880	5	1.0 (ref)	882	5	1.0 (ref)
Some	1492	6	1.2 (0.8 to 1.7)	1492	5	1.0 (0.7 to 1.4)
Most	1604	6	1.3 (0.9 to 1.8)	1598	5	1.0 (0.7 to 1.4)
Not applicable†	416	11	2.1 (1.4 to 3.2)	419	9	1.7 (1.1 to 2.6)
Missing	29			28		

*Number of respondents who answered the question on physical violence or sexual assault.

†Likely indicates respondents who were currently not working but who worked in the past.

AFAB, assigned female at birth; AMAB, assigned male at birth; CI, confidence interval; PR, prevalence ratio; ref, reference.

workplace violence against TNB workers has also generated mixed results. A 2021 study of lesbian, gay, bisexual and transgender workers found that workers of colour were more likely

to experience workplace discrimination and harassment.¹⁷ In the 2015 US Transgender Survey, in contrast, the past-year prevalence of any type of workplace violence was similar between

Table 3 Lifetime prevalence of workplace violence by gender identity and race/ethnicity, National Transgender Discrimination Survey, 2008–2009

	Gender identity	Harassment prevalence (95% CI)		Physical violence prevalence (95% CI)		Sexual assault prevalence (95% CI)	
		Person of colour	Non-Hispanic white	Person of colour	Non-Hispanic white	Person of colour	Non-Hispanic white
Assigned male at birth	Transfeminine	57 (52 to 62)	51 (49 to 53)	19 (15 to 23)	6 (5 to 8)	15 (12 to 19)	5 (4 to 6)
	Non-binary	55 (46 to 64)	43 (36 to 50)	16 (10 to 24)	6 (3 to 10)	17 (10 to 25)	5 (3 to 9)
Assigned female at birth	Transmasculine	50 (44 to 56)	48 (45 to 52)	4 (2 to 7)	3 (2 to 5)	5 (3 to 9)	3 (2 to 4)
	Non-binary	63 (56 to 70)	45 (41 to 49)	8 (4 to 13)	4 (2 to 6)	6 (3 to 10)	4 (3 to 6)

CI, confidence interval.

white, black and Latinx respondents (15% prevalence for all three groups), but substantially higher for American Indian and Alaska Native (28%) and Middle Eastern or North African (26%) respondents.¹⁰ Our study's sample size was too small to present reliable estimates from these last two racial groups; our aggregation of multiple racial/ethnic groups might be concealing additional racial/ethnic disparities. In the US workforce overall, American Indian and Alaska Native workers are more likely to report a hostile working environment than workers of other racial/ethnic groups.²¹ A limitation of our analysis was that if multiple forms of discrimination were occurring in the workplace, respondents might not have been able to accurately report if acts of violence were perpetrated due to their gender identity, racial identity or some other reason.

In our study population, having less than a high school education was strongly associated with a higher lifetime prevalence of physical violence and sexual assault at work. Although educational attainment is correlated with broad occupational groups, we had no information about respondents' jobs or workplaces and therefore could not determine if this result indicates that certain jobs or workplace characteristics pose greater risks than others with respect to workplace violence against TNB workers. In studies of all types of workplace violence (not only gender identity-related), rates differ substantially by occupational group.^{9,19} Future research that includes information on industry and occupation (using standard data collection that would allow linkage to other occupational data sources), workplace characteristics and the relationship between victim and perpetrator would help to better understand the causes and prevention of gender identity-based workplace violence. For example, previous research using data from the 2007–2015 National Crime Victimization Survey (NCVS) showed that workplace crimes against men were more likely to be perpetrated by strangers, whereas crimes against women were more likely to be perpetrated by people they knew, such as clients, coworkers or supervisors.⁹ At that time, the NCVS did not collect information on transgender identity; now that this information is being collected, the NCVS could be an important data source for better understanding workplace violence against transgender workers.¹²

The NTDS was not a nationally representative survey of TNB workers, and therefore our estimates might not be generalisable to the US TNB worker population. Because this survey was advertised as a study specifically interested in learning about experiences of discrimination, people who experienced discrimination were probably more likely to participate than others; as a result, our estimates of workplace violence might be higher than in the US TNB worker population as a whole. Using survey data to study workplace violence was both a limitation and strength. Respondents might have interpreted questions about workplace violence differently, leading to misclassification; for example, 'harassment' was not defined in the questionnaire. Self-reported workplace violence, however, could be more completely reported in this anonymous survey than would be found in official statistics because workplace violence is often not reported to law enforcement, leading to higher sensitivity of outcome assessment—this could be even more true for TNB people, who might avoid interactions with law enforcement because of the risk for mistreatment.^{9,10,22,23}

In this sample, 17% had worked in the street economy at some point, but the majority of respondents (83%) only ever worked in the conventional economy. The higher prevalence of workplace violence we observed among those who ever worked in the street economy is not surprising; workers in the street economy experience high rates of violence.^{24,25} We did not have

sufficient data to determine if respondents who ever worked in the street economy also worked in the conventional economy at some point, and if violence was experienced in only one or in both of these work settings.

A limitation of this dataset was that information on workplace violence was collected over the working lifetime. Without information about length of time in the labour market, we could not take into account work history differences between respondents. As a result, we were restricted to estimating prevalence over an unspecified working lifetime. Because TNB populations are known to experience high rates of unemployment and job change, variables such as age might not be a good proxy for length of time in the labour market. Longitudinal research or studies with more information on time in the workforce will be needed to estimate how frequently workplace violence occurs. Because the outcome (workplace violence) was collected over a working lifetime and most predictor variables were collected with respect to the respondent's current situation, of particular importance is the possibility that respondents changed their working environment in response to workplace violence. For example, a TNB worker who experiences workplace violence might move to a new job and not reveal to new coworkers that they are TNB; a previous report found that 71% of respondents had ever hid their gender identity or gender transition at work to avoid discrimination or violence, with transgender men and women more likely to report doing so than non-binary respondents.¹⁰ In our study population, people whose transgender identity was currently unknown at work still reported a high lifetime prevalence of gender identity-based workplace violence. This result suggests that these respondents could be currently concealing their transgender identity at work, perhaps in part due to previous experiences with discrimination or workplace violence. We also found that people who answered 'not applicable' to the question about people's current awareness of their gender identity at work were substantially more likely than other groups to report ever experiencing workplace violence. This result suggests that previous experiences of violence might have driven these respondents out of the workforce or into jobs where they had no coworkers (eg, some forms of self-employment). Every year, an estimated 15% of TNB workers quit their job to avoid workplace discrimination.¹⁰ Pervasive workplace discrimination and violence is thought to be the reason why TNB people have an unemployment rate estimated at three times that of cisgender people.¹⁰

This analysis was descriptive and meant to highlight the scope of the problem of gender identity-based workplace violence, allowing occupational health practitioners to better protect their workforce, particularly workers at greatest risk. Further research will be needed to explain why certain groups of workers have higher risk than others. For example, a previous report found that black and Latinx NTDS respondents and those with lower educational attainment were more likely to work in the street economy than other respondents, which could partly account for the higher rates of physical violence and sexual assault observed in these worker groups.¹¹

Violence prevention programmes are integral tools for preventing violence in the workplace, but existing programmes might not adequately address gender identity-based violence. Given the high prevalence of workplace violence experienced by TNB workers, employers in the conventional workforce can incorporate elements specific to gender identity-based workplace violence into their violence prevention programmes, including training, written antidiscrimination policies, policies that encourage reporting, identifying and training allies to

take reports of workplace violence and thorough investigation of incidents of gender identity-based violence. More broadly, employer toolkits are available to help foster the inclusion of TNB workers in the workplace, with recommendations for onboarding, training, support, communication, healthcare coverage and other aspects of the work culture and operations.^{26 27} A study in Austria found that lesbian, gay, bisexual, transgender and intersex (LGBTI) workers were more likely to be out in the workplace if their employer fostered an LGBTI-friendly work environment and if there were antidiscrimination provisions in their labour contracts.²⁸ In the USA, TNB workers are further protected by Title VII of the Civil Rights Act of 1964, which prohibits employment-related discrimination or harassment based on sex; 'sex' includes both gender identity and sexual orientation following the 2020 *Bostock v Clayton County* Supreme Court decision.²⁹ For workers in the street economy, broader legal and societal interventions have been recommended to prevent gender identity-based workplace violence, including decriminalisation of sex work, educational interventions to reduce transphobia and social policies to improve economic opportunities for TNB people.^{30 31}

Workplace violence against TNB workers due to their gender identity is prevalent. Workplace violence prevention programmes should incorporate ways to prevent gender identity-based violence, particularly for groups at greatest risk.

Contributors IE and CJ drafted the manuscript; IE, AB-G and CJ conducted the analyses; IE, AB-G, LH, SLeG, KW, TO and CJ interpreted results and edited the manuscript. CJ is the guarantor of the study.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval This study was reviewed by the Duke University Health System Institutional Review Board (protocol no. 00108637) and was determined to be exempt from continuing review. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party. The data used in this analysis are available at <https://doi.org/10.3886/ICPSR37888.v1>.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

ORCID iD

Candice Y. Johnson <http://orcid.org/0000-0002-2544-3110>

REFERENCES

- 1 U.S. Occupational Safety and Health Administration Workplace violence - overview. 2023. Available: <https://www.osha.gov/workplace-violence> [Accessed 5 Jan 2024].
- 2 Arbury S, Collins NR, Magtahas J, et al. OSHA workplace violence enforcement. *J Occup Environ Med* 2022;64:e211–6.
- 3 U.S. Occupational Safety and Health Administration. Workplace violence. Enforcement; 2023. Available: <https://www.osha.gov/workplace-violence/enforcement>
- 4 Rudkjoebing LA, Hansen ÅM, Rugulies R, et al. Exposure to workplace violence and threats and risk of depression: a prospective study. *Scand J Work Environ Health* 2021;47:3976:582–90..
- 5 Hoffmann SH, Bjorner JB, Xu T, et al. Workplace violence and long-term sickness absence: assessment of the potential buffering effect of social support in two occupational cohort studies. *J Occup Environ Med* 2020;62:830–8.
- 6 Xu T, Magnusson Hanson LL, Lange T, et al. Workplace bullying and workplace violence as risk factors for cardiovascular disease: a multi-cohort study. *Eur Heart J* 2019;40:1124–34.
- 7 Magnavita N, Di Stasio E, Capitanelli I, et al. Sleep problems and workplace violence: a systematic review and meta-analysis. *Front Neurosci* 2019;13:997.
- 8 Harrell E, Langton L, Petosa J, et al. Indicators of workplace violence, 2019. In: *NCJ 250748*. U.S. Bureau of Justice Statistics, 2022.
- 9 Siegel M, Johnson CY, Lawson CC, et al. Nonfatal violent workplace crime characteristics and rates by occupation - United States, 2007–2015. *MMWR Morb Mortal Wkly Rep* 2020;69:324–8.
- 10 James SE, Herman JL, Rankin S, et al. *The Report of the 2015 U.S. Transgender Survey*. National Center for Transgender Equality, 2016.
- 11 Grant JM, Mottet LA, Tanis J, et al. Injustice at every turn: A report of the National Transgender Discrimination Survey. *National Center for Transgender Equality and National Gay and Lesbian Task Force* 2011.
- 12 Truman JL, Morgan RE. Violent victimization by sexual orientation and gender identity, 2017–2020 NCJ. *US Bureau of Justice Statistics* 2022.
- 13 Brown A. About 5% of young adults in the U.S. say their gender is different from their sex assigned at birth. *Pew Research Center* 2022. Available: <https://www.pewresearch.org/short-reads/2022/06/07/about-5-of-young-adults-in-the-u-s-say-their-gender-is-different-from-their-sex-assigned-at-birth/> [Accessed 5 Jan 2024].
- 14 U.S. Bureau of Labor Statistics. Employment status of the civilian noninstitutional population by age, sex, and race. *Labor Force Statistics from the Current Population Survey* 2023. Available: <https://www.bls.gov/cps/cpsaat03.pdf> [Accessed 5 Jan 2024].
- 15 Grant JM, Mottet L, Tanis J, et al. National Transgender Discrimination Survey [United States], 2008–2009. 2020. Available: <https://doi.org/10.3886/ICPSR37888.v1>
- 16 Lesko CR, Fox MP, Edwards JK. A framework for descriptive epidemiology. *Am J Epidemiol* 2022;191:2063–70.
- 17 Sears B, Mallory C, Flores AR, et al. Williams Institute; LGBT People's Experiences of Workplace Discrimination and Harassment. . 2021 Available: <https://williamsinstitute.law.ucla.edu/publications/lgbt-workplace-discrimination/> [Accessed 5 Jan 2024].
- 18 Human Rights Campaign Foundation. A national epidemic: fatal anti-transgender violence in the United States in 2019. 2019. Available: <https://assets2.hrc.org/files/assets/resources/Anti-TransViolenceReport2019.pdf> [Accessed 5 Jan 2024].
- 19 Guay S, Goncalves J, Jarvis J. A systematic review of exposure to physical violence across occupational domains according to victims' sex. *Aggression and Violent Behavior* 2015;25:133–41.
- 20 Guay S, Goncalves J, Jarvis J. Verbal violence in the workplace according to victims' sex—a systematic review of the literature. *Aggression and Violent Behavior* 2014;19:572–8.
- 21 Alterman T, Luckhaupt SE, Dahlhamer JM, et al. Job insecurity, work-family imbalance, and hostile work environment: prevalence data from the 2010 national health interview survey. *Am J Ind Med* 2013;56:660–9.
- 22 Hartley D, Doman B, Hendricks SA, et al. Non-fatal workplace violence injuries in the United States 2003–2004: a follow back study. *Work* 2012;42:125–35.
- 23 Wolff KB, Cokely CL. To protect and to serve?": an exploration of police conduct in relation to the gay, Lesbian, Bisexual, and Transgender community. *Sex Cult* 2007;11:1–23.
- 24 McGinty EE, Choksy S, Wintemute GJ. The relationship between controlled substances and violence. *Epidemiol Rev* 2016;38:5–31.
- 25 Hayashi K, Daly-Grafstein B, Dong H, et al. The relationship between violence and engagement in drug dealing and sex work among street-involved youth. *Can J Public Health* 2016;107:e88–93.
- 26 Human Rights Campaign Foundation. Gender diversity in the workplace: a transgender and non-binary toolkit for employers. 2023. Available: <https://www.thehrcfoundation.org/professional-resources/trans-toolkit-for-employers> [Accessed 5 Jan 2024].
- 27 Out & Equal. Global toolkit for change: assessing LGBTQI+ inclusion in your workplace. Out & Equal; 2022. Available: <https://outandequal.org/global-toolkit-for-change-assessing-lgbtqi-inclusion-in-your-workplace/> [Accessed 5 Jan 2024].
- 28 Markovic L, Schönherr D, Zandonella M, et al. Associations between workplace characteristics and 'outness' in LGBTI workers in Austria. *Occup Environ Med* 2022;79:10–6.
- 29 U.S. Equal Employment Opportunity. Protections Against Employment Discrimination Based on Sexual Orientation or Gender Identity. . 2021 Available: <https://www.eeoc.gov/laws/guidance/protections-against-employment-discrimination-based-sexual-orientation-or-gender> [Accessed 5 Jan 2024].
- 30 Lyons T, Krüsi A, Pierre L, et al. Negotiating violence in the context of transphobia and criminalization: the experiences of trans sex workers in Vancouver, Canada. *Qual Health Res* 2017;27:182–90.
- 31 Brents BG, Hausbeck K. Violence and legalized brothel prostitution in Nevada: examining safety, risk, and prostitution policy. *J Interpers Violence* 2005;20:270–95.

SUPPLEMENTARY MATERIALS

Contents

Supplementary Methods	2
Figure S1: Algorithm used to code gender identity for respondents assigned male at birth	4
Table S1. Lifetime Prevalence of Workplace Violence, Transmasculine and Transfeminine Workers, National Transgender Discrimination Survey, 2008–2009	5
Table S2. Lifetime Prevalence of Workplace Violence, Non-Binary Respondents, National Transgender Discrimination Survey, 2008–2009	7

Supplementary Methods

Gender Identity. The NTDS asked a series of questions about participants' gender identity. First, respondents were asked about sex assigned at birth and primary gender identity (male/man, female/woman, part time as one gender part time as another, and a gender not listed), with an option to write in additional responses for the primary gender identity. This question was followed by a list of 15 gender identity terms, which prompted respondents to answer the degree to which each term applied to them (not at all, somewhat, strongly). Respondents could also write in additional terms. Based on this series of questions about gender identity, we created an algorithm to classify respondents into four gender identities: transmasculine, transfeminine, non-binary assigned male at birth, and non-binary assigned female at birth. We excluded respondents who did not report their sex assigned at birth; those whose gender identity was most strongly crossdresser, drag performer, or intersex and did not identify as transgender; and those whose responses to the gender identity questions were contradictory. Figures S1 shows the algorithm used for people assigned male at birth. The algorithm for those assigned female at birth follows the same pattern.

Race: The survey provided a list of races and ethnicities and asked respondents to select all that applied. Options were White, Black or African American, American Indian or Alaskan Native (with write-in option for their enrolled or principal tribe), Hispanic or Latino, Asian or Pacific Islander, Arab or Middle Eastern, or Multiracial or Mixed race. We recoded these responses into four participant categories: 1) non-Hispanic Black, 2) Hispanic or Latinx, 3) non-Hispanic White, and 4) all other non-Hispanic groups. There were too few respondents who selected American Indian, Alaska Native, Asian, Pacific Islander, Middle Eastern, or Multiracial to reliably disaggregate results further.

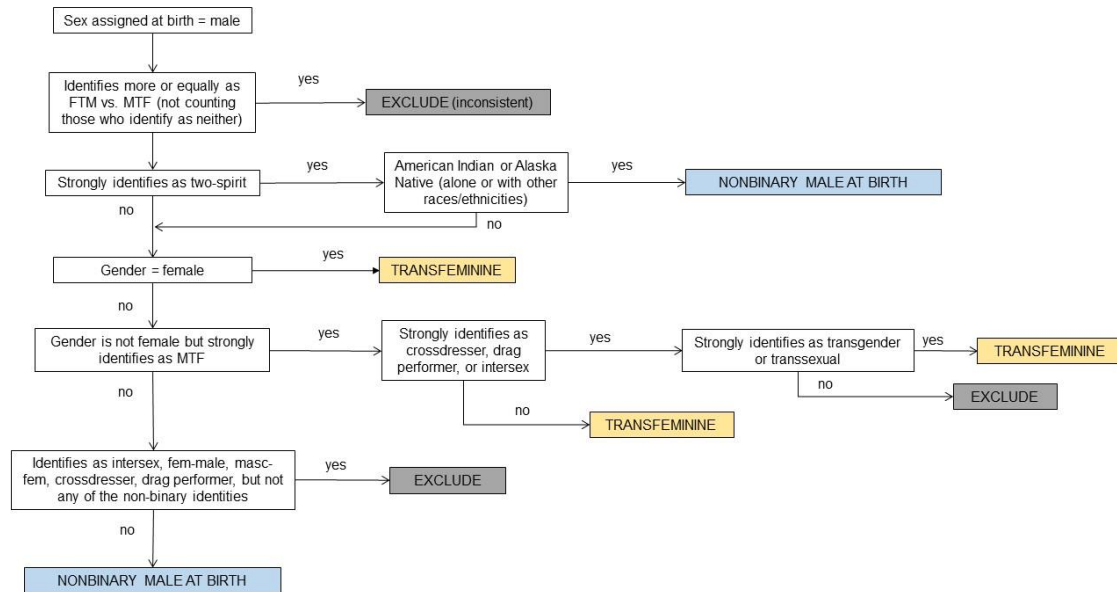
Age: We grouped age into five categories: 18–24, 25–34, 35–44, 45–54, and 55 years and older.

Education: The survey provided 11 options for educational attainment, ranging from “elementary and/or junior high” to “doctorate degree (for example: PhD, EdD)”. We collapsed these into five categories: less than high school, high school, some college, college degree, or graduate degree.

Working in the street economy: The survey asked if participants had ever worked for pay in the street economy, and asked respondents to indicate if this work was sex work/sex industry, drug sales, or another type of street work (with an option for respondents to enter a text description). We categorized respondents who indicated that they participated in any of these types of work as having worked in the street economy at some point.

Awareness of transgender identity: Respondents were asked “How many people know or believe you are transgender/gender non-conforming in each of the following settings... On the job?” with response options of none, a few, some, most, all, and not applicable. We collapsed these categories into none, some (a few/some), most (most/all), and not applicable. The not

applicable category was retained because these respondents could represent those who had a job in the past but were not currently working or those who were working in a job with little contact with coworkers or clients (*e.g.*, some forms of self-employment).

Figure S1: Algorithm used to code gender identity for respondents assigned male at birth

Abbreviations: Fem-male, feminine male; FTM, female to male; masc-fem, masculine female; MTF, male to female.

Table S1. Lifetime Prevalence of Workplace Violence, Transmasculine and Transfeminine Workers, National Transgender Discrimination Survey, 2008–2009

	Overall N	Harassment			Physical Violence			Sexual Assault		
		N ^a	Prev. (%)	PR (95% CI)	N ^a	Prev. (%)	PR (95% CI)	N ^a	Prev. (%)	PR (95% CI)
Full Population	3,411	3,383	51		3,285	7		3,283	6	
Gender Identity										
Transmasculine	1,258	1,251	49	1.0 (ref)	1,215	4	1.0 (ref)	1,220	3	1.0 (ref)
Transfeminine	2,153	2,132	52	1.1 (1.0–1.1)	2,070	9	2.3 (1.7–3.2)	2,063	7	2.0 (1.4–2.8)
Race/ethnicity										
Non-Hispanic Black	128	126	43	0.9 (0.7–1.0)	120	13	2.5 (1.6–4.1)	119	12	2.8 (1.7–4.7)
Non-Hispanic White	2,690	2,674	50	1.0 (ref)	2,599	5	1.0 (ref)	2,596	4	1.0 (ref)
Hispanic or Latinx	196	189	55	1.1 (1.0–1.3)	185	16	3.0 (2.1–4.3)	187	14	3.3 (2.2–4.9)
All Other Non-Hispanic	379	377	56	1.1 (1.0–1.2)	365	11	2.0 (1.5–2.9)	365	9	2.1 (1.4–3.0)
Missing	18	17			16			16		
Age										
18–24	493	486	51	1.0 (ref)	481	8	1.0 (ref)	482	7	1.0 (ref)
25–34	1,128	1,125	52	1.0 (0.9–1.1)	1,097	8	1.0 (0.7–1.4)	1,094	7	1.0 (0.7–1.5)
35–44	675	669	52	1.0 (0.9–1.2)	639	6	0.7 (0.5–1.1)	638	5	0.8 (0.5–1.2)
45–54	636	635	52	1.0 (0.9–1.2)	613	7	1.0 (0.6–1.4)	613	4	0.6 (0.4–1.1)
55 or Older	418	408	45	0.9 (0.8–1.0)	398	4	0.5 (0.3–0.9)	400	4	0.5 (0.3–1.0)
Missing	61	60			57			56		
Education										
Less Than High School	89	89	64	1.3 (1.1–1.6)	81	22	5.4 (3.2–9.0)	80	14	3.2 (1.7–6.1)
High School	274	268	54	1.1 (1.0–1.3)	261	10	2.3 (1.4–3.8)	261	8	1.9 (1.1–3.2)
Some College	1,433	1,423	55	1.1 (1.0–1.2)	1,370	8	1.9 (1.3–2.8)	1,369	7	1.5 (1.1–2.2)
College Degree	920	917	48	1.0 (ref)	891	4	1.0 (ref)	891	4	1.0 (ref)
Graduate Degree	690	681	43	0.9 (0.8–1.0)	677	5	1.1 (0.7–1.8)	677	3	0.7 (0.4–1.2)
Missing	5	5			5			5		
Ever Worked in Street Economy										
No	2,794	2,774	48	1.0 (ref)	2,694	4	1.0 (ref)	2,696	4	1.0 (ref)
Yes	574	566	67	1.4 (1.3–1.5)	552	18	3.9 (3.1–5.1)	547	14	3.7 (2.8–4.9)
Missing	43	43			39			40		
People at Current Job Aware of Gender Identity										
None	679	672	42	1.0 (ref)	651	5	1.0 (ref)	652	6	1.0 (ref)
Some	1,133	1,126	51	1.2 (1.1–1.4)	1,098	6	1.2 (0.8–1.7)	1,099	5	1.0 (0.6–1.4)
Most	1,218	1,208	51	1.2 (1.1–1.4)	1,183	6	1.2 (0.8–1.8)	1,178	5	0.8 (0.6–1.3)
Not Applicable ^b	356	352	64	1.5 (1.4–1.7)	330	12	2.3 (1.5–3.5)	331	9	1.6 (1.0–2.6)

Missing	25	25	23	23
---------	----	----	----	----

Abbreviations: CI, confidence interval; N, number of participants in analysis; PR, prevalence ratio; Prev, prevalence.

^a Number of respondents who answered the question on workplace harassment.

^b Likely indicates respondents who were currently not working but who worked in the past.

Table S2. Lifetime Prevalence of Workplace Violence, Non-Binary Respondents, National Transgender Discrimination Survey, 2008–2009

	Overall N	Harassment			Physical Violence			Sexual Assault		
		N ^a	Prev. (%)	PR (95% CI)	N ^a	Prev. (%)	PR (95% CI)	N ^a	Prev. (%)	PR (95% CI)
Full Population	1,186	1,178	51		1,136	6		1,136	6	
Gender Identity										
Non-Binary AMAB	342	337	47	1.0 (0.8–1.1)	326	9	2.0 (1.2–3.1)	326	9	2.0 (1.3–3.2)
Non-Binary AFAB	844	841	49	1.0 (ref)	810	5	1.0 (ref)	810	5	1.0 (ref)
Race/ethnicity										
Non-Hispanic Black	32	32	31	0.7 (0.4–1.2)	29	--	--	30	--	--
Non-Hispanic White	845	842	44	1.0 (ref)	810	4	1.0 (ref)	811	4	1.0 (ref)
Hispanic or Latinx	74	72	50	1.1 (0.9–1.4)	74	14	3.3 (1.7–6.5)	73	11	2.5 (1.2–5.1)
All Other Non-Hispanic	227	224	67	1.5 (1.4–1.7)	215	11	2.7 (1.7–4.5)	214	9	2.0 (1.2–3.4)
Missing	8	8			8			8		
Age										
18–24	288	287	53	1.0 (ref)	281	7	1.0 (ref)	278	7	1.0 (ref)
25–34	449	445	49	0.9 (0.8–1.1)	427	5	--	430	6	--
35–44	134	132	60	1.1 (0.9–1.3)	125	6	--	127	6	--
45–54	69	69	49	0.9 (0.7–1.2)	66	8	--	66	--	--
55 or Older	36	36	44	0.8 (0.6–1.2)	36	--	--	36	--	--
Missing	210	209			201			199		
Education										
Less Than High School	30	29	55	1.3 (0.9–1.9)	29	21	6.2 (2.5–15.0)	29	24	7.1 (3.1–16.5)
High School	55	53	47	1.1 (0.8–1.5)	53	17	5.1 (2.3–11.3)	53	13	3.9 (1.6–9.4)
Some College	392	388	42	1.2 (1.1–1.4)	373	7	2.0 (1.0–3.9)	377	7	2.0 (1.0–3.8)
College Degree	402	401	42	1.0 (ref)	388	3	1.0 (ref)	385	4	1.0 (ref)
Graduate Degree	303	303	53	1.3 (1.1–1.5)	289	5	1.4 (0.7–3.0)	288	5	1.5 (0.7–3.2)
Missing	4	4			4			4		
Ever Worked in Street Economy										
No	958	954	46	1.0 (ref)	922	4	1.0 (ref)	921	4	1.0 (ref)
Yes	211	207	59	1.3 (1.1–1.5)	198	13	2.8 (1.8–4.6)	199	16	4.2 (2.7–6.7)
Missing	17	17			16			16		
People at Current Job Aware of Gender Identity										
None	241	239	31	1.0 (ref)	229	4	1.0 (ref)	230	5	1.0 (ref)
Some	416	412	50	1.6 (1.3–2.0)	394	6	1.3 (0.6–2.8)	393	5	1.0 (0.5–2.1)
Most	431	429	54	1.8 (1.4–2.2)	421	7	1.5 (0.8–3.1)	420	7	1.4 (0.7–2.8)
Not Applicable ^b	91	91	64	2.1 (1.6–2.7)	86	6	1.3 (0.5–3.8)	88	9	1.9 (0.8–4.6)
Missing	7	7								

Abbreviations: CI, confidence interval; N, number in analysis; PR, prevalence ratio; Prev, prevalence; --, N<5 or too few observations for the model to run.

^a Number of respondents who answered the question on workplace harassment.

^b Likely indicates respondents who were currently not working but who worked in the past.