

Differences in Discrimination, Violence, Mental Health, and Substance Use Outcomes by Cancer History Among LGBTQ+ Individuals in North Carolina

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BACKGROUND Health inequities among lesbian, gay, bisexual, transgender, queer, and other sexual and gender minority populations (LGBTQ+) are driven by anti-LGBTQ+ stigma and discrimination. However, there is limited research on the manifestations of stigma and discrimination among LGBTQ+ cancer survivors.

METHODS Data were collected by the North Carolina Department of Health and Human Services via the 2023 North Carolina LGBTQ+ Health Needs Assessment. Differences in outcomes (i.e., discrimination, violence, homelessness, mental health, substance use, and overdose) between LGBTQ+ individuals by cancer history were assessed using Chi-squared tests. Further, multivariable logit models were used to generate predicted probabilities, average marginal effects (AME), and 95% confidence intervals (CI) of the association of cancer with each outcome.

RESULTS A total of N = 3170 LGBTQ+ individuals (n = 200 cancer survivors) took part in the survey. In adjusted analyses, cancer history was associated with an 8.1 to 19.1 percentage point increase in the probability of all discrimination, violence, and homelessness outcomes. The largest AME of cancer was with accidental overdose (AME: 22.5; 95% CI, 15.2–29.8), followed by homelessness (AME: 19.1; 95% CI, 11.6–26.6), spouse or family violence (AME: 16.7; 95% CI, 9.3–24.1), LGBTQ+ violence (AME: 15.1; 95% CI, 7.8–22.5), sexual assault (AME: 14.1; 95% CI, 6.0–22.2), as well as nicotine product (AME: 9.0; 95% CI, 1.6–16.5) and cocaine use (AME: 8.9; 95% CI, 3.8–14.1). The most common barriers to mental health services were cost (36.0%) and health insurance (33.5%).

LIMITATIONS The needs assessment was a convenience-based study, which limits the generalizability of our findings.

CONCLUSIONS LGBTQ+ cancer survivors in North Carolina experience an elevated burden of discrimination, violence, suicide attempt, substance use, and accidental overdose in comparison to LGBTQ+ individuals without a cancer history.

Lesbian, gay, bisexual, transgender, queer, and other sexual and gender minority (LGBTQ+) individuals make up at least 7.1% of the US population [1]. LGBTQ+ populations throughout the United States face identity-related discrimination and stigma at the intrapersonal (i.e., individual response to discrimination), interpersonal (i.e., interactions between stigmatized and non-stigmatized individuals), and structural (i.e., labeling, stereotyping, and discrimination in a context of power differentials) levels [2, 3]. However, LGBTQ+ identity-related discrimination and stigma are not uniform across the United States; LGBTQ+ individuals experience more discrimination and stigma in certain portions of the country, including states in the South such as North Carolina [4].

Due to anti-LGBTQ+ stigma and discrimination, LGBTQ+ populations experience worse physical, mental, social, and financial health in comparison to their cisgender and heterosexual counterparts, both within and outside of the cancer context [5–11]. LGBTQ+ populations are also more likely to engage in coping behaviors with negative health consequences, such as binge drinking and cigarette smoking [12, 13]. Such maladaptive coping behaviors and resultant disparities are frequently contextualized in the minority stress model (i.e., the stress caused by discrimination

and stigma) as well as the National Institutes of Health's Sexual and Gender Minority Health Disparities Research Framework (i.e., a socioecological approach to drivers of health disparities) [14–17]. The cumulative impact of anti-LGBTQ+ discrimination and stigma experienced by LGBTQ+ individuals contributes to high rates of life-threatening experiences and outcomes, such as violence, substance use, poor mental health, experiences of homelessness, and suicide.

At the same time, some cancer survivors experience increased rates of similarly life-threatening outcomes, such as substance use and suicidality [18, 19]. Therefore, we hypothesize that the combined effects of anti-LGBTQ+ stigma and discrimination and cancer will result in LGBTQ+ cancer survivors reporting higher rates of discrimination, violence, poor mental health, substance use, and accidental overdose outcomes in comparison to LGBTQ+ individuals without a cancer history. However, the experiences of such life-threatening outcomes among LGBTQ+ cancer

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survivors in an area of the United States with substantial anti-LGBTQ+ discrimination and stigma [4] have not been previously described in the literature. Thus, using data from the North Carolina LGBTQ+ Health Needs Assessment, we aimed to investigate potential differences in discrimination, violence, mental health, substance use, and accidental overdose outcomes among LGBTQ+ individuals with and without a cancer history. Further, we aimed to describe commonly reported mental health coping behaviors and barriers to mental health services among LGBTQ+ cancer survivors. Findings specific to LGBTQ+ cancer survivors in North Carolina are of the utmost importance for identifying where health services and programs could be improved to minimize life-threatening outcomes and move toward health equity for this population.

Methods

The North Carolina LGBTQ+ Health Needs Assessment

Data were collected by the North Carolina Department of Health and Human Services (NCDHHS) through its 2023 North Carolina LGBTQ+ Health Needs Assessment. The LGBTQ+ needs assessment survey was a cross-sectional instrument that included questions about demographics and identity, physical and mental health, health care access, substance use, discrimination, violence, homelessness, and other social determinants of health. Eligible participants were at least 18 years of age, currently living in North Carolina, and identified as LGBTQ+. Participants were recruited at 27 LGBTQ+ Pride events across the state between June 2023 and October 2023 (Figure 1). At each Pride event, the North Carolina LGBTQ+ Health Needs Assessment had a booth or table from which NCDHHS staff (J.W.) and volunteers physically approached LGBTQ+ individuals to participate in the needs assessment. The needs assessment was completed on a tablet at each Pride event. While most LGBTQ+ Pride events happen in the month of June (i.e., Pride Month), celebrations at the city or county level often take place throughout the summer and into the fall. LGBTQ+ Pride events are celebrations, often festivals or parades, of LGBTQ+ identity

and culture that strive to provide all LGBTQ+ individuals a safe space to be their authentic selves. A total of N = 3170 LGBTQ+ individuals engaged in the informed consent process and took part in the needs assessment. Those who took part in the needs assessment were provided an LGBTQ+ Pride pin as a thank you for their time. The North Carolina LGBTQ+ Needs Assessment was approved by the University of North Carolina Institutional Review Board. Survey questions for each outcome can be found in the Appendix.

Cancer and Demographic Factors

The presence of a cancer history was identified in this analysis using a single question, which asked participants if they have had a cancer diagnosis. Other demographic characteristics used in this analysis included gender, age at survey (continuous), race and ethnicity, education level, annual household income, primary source of health insurance coverage, and self-reported rurality. Due to small group sizes, gender was collapsed into four categories: cisgender woman, cisgender man, non-binary/genderqueer, and transgender/multiple gender/another gender. Race and ethnicity were collapsed into four categories: White, Black, Hispanic/Latine/Latinx, and Multi-racial/another race. Education was collapsed into four categories: high school or less, some college, associate or bachelor's degree, and graduate degree.

LGBTQ+ Discrimination, Violence, and Experiences of Homelessness

LGBTQ+ participants were asked if they had ever experienced: discrimination based on their LGBTQ+ identity (i.e., LGBTQ+ discrimination); physical or sexual violence based on LGBTQ+ identity (i.e., LGBTQ+ violence); violence from their spouse, partner, or family member (i.e., spouse or family violence); or anyone having had sex with them after they said no or showed that they did not want them to (i.e., sexual assault). Experiences of homelessness were ascertained by asking participants two questions: 1) if they, in the last 12 months, did not have a consistent place to live, and 2) if they slept outside, in a shelter, or in another place not meant for

FIGURE 1.
Geographical Distribution of LGBTQ+ Needs Assessment Recruitment at 27 LGBTQ+ Pride Events in 2023



sleeping. Participants were considered to have experienced homelessness if they selected yes to either question.

Mental Health, Substance Use, and Accidental Overdose

Mental health was ascertained by asking a single 'select all that apply' question that asked if participants had ever had any of the following mental health issues: depression, thinking about killing yourself, attempting to kill yourself, bipolar disorder, post-traumatic stress disorder or PTSD, and anxiety disorder. Substance use questions asked about the frequency of current use (never, some days, every day) of alcohol, marijuana, cocaine, opioids, amphetamines, and benzodiazepines. Nicotine product use was ascertained by one question asking if participants use nicotine products, followed by a list of nicotine products, including cigarettes, vapes, chewing tobacco, and other nicotine products. Dichotomous substance use outcome variables were generated by collapsing some days and every day, resulting in use versus no use for each substance. Participants classified as reporting hard drug use if they reported using cocaine, opioids, amphetamines, or benzodiazepines. Accidental overdose was ascertained by asking if the participant had ever accidentally overdosed and when it occurred. The binary outcome of accidental overdose was categorized as any report of accidental overdose versus never having had an accidental overdose.

Mental Health Coping Strategies and Barriers to Mental Health Services

Mental health coping strategies were measured by asking a 'select all that apply' question about if participants had used any of the following for their mental health: therapy or counseling; support group; prescription medication; meditation; talking with friends or family; exercise or outdoor activities; alcohol, tobacco, or drugs; or none of these. Barriers to mental health services were measured with a 'select all that apply' question about which barriers participants have ever faced to accessing mental health services, including: lack of health insurance, health insurance not covering much, mental health professionals not taking certain insurance plans, cost of mental health services, not knowing how to find mental health services, lack of professionals in area, lack of LGBTQ+-affirmative professionals in area, embarrassment about a mental health problem, bad previous experience, or no barriers. Related barriers were collapsed, resulting in seven types of barriers: cost, insurance, LGBTQ+-affirmative provider availability, general availability, bad prior experiences, unsure how to find, and mental health stigma.

Statistical Analysis

Differences in demographic groups between LGBTQ+ participants that reported a prior cancer diagnosis (i.e., cancer survivors) and those who did not were assessed using Chi-squared tests. Differences in all outcomes (i.e., LGBTQ+ discrimination, violence, homelessness, mental health, sub-

stance use, and overdose) by cancer status were assessed using Chi-squared tests. Differences in outcomes by cancer history were visualized in bar charts. Multivariable logit models controlling for demographic characteristics that differed by cancer status were used to generate predicted probabilities and 95% confidence intervals (CI) for LGBTQ+ individuals with and without a cancer history for each outcome. Multivariable logit models were also used to estimate average marginal effects (AME) and 95% CI for each outcome. Logit models controlled for sexual orientation, gender, age, race and ethnicity, education, income, and rurality. Lastly, mental health coping strategies and barriers to mental health services among LGBTQ+ individuals with a history of cancer were visualized using bar charts.

Results

A total of N = 200 (6.3%) of the N = 3170 LGBTQ+ participants reported ever being diagnosed with cancer (Table 1). LGBTQ+ cancer survivors differed from those without a cancer history across most demographic characteristics except for race and ethnicity. LGBTQ+ cancer survivors identified as gay or lesbian (45.5% versus 34.7%) and cisgender (cis-woman: 60.9%, cis-man: 22.3% versus cis-woman: 45.0%, cis-man: 20.1%) more frequently than LGBTQ+ participants without a cancer history. LGBTQ+ cancer survivors were also older at the time of the survey (ages 40–64, 47.2% versus 15.5%), more educated (graduate degree, 27.9% versus 16.0%), higher income (> \$100,000, 24.4% versus 17.0%) and more frequently on public insurance (18.0% versus 10.3%). There was no difference in uninsurance between LGBTQ+ individuals with and without a cancer history (8.2% versus 7.5%).

In bivariate analyses, LGBTQ+ cancer survivors were more likely to report ever experiencing LGBTQ+ violence (33.0% versus 23.3%, $P = .002$), spouse or family violence (50.5% versus 38.2%, $P = .001$), and sexual assault (48.5% versus 39.2%, $P = .021$), as well as experiencing homelessness in the last 12 months (17.0% versus 5.8%, $P < .0001$; Table 2). No difference in lifetime experience of LGBTQ+ discrimination was detected by cancer status. LGBTQ+ individuals without a cancer history were more likely to report depression (72.7% versus 63.5%, $P = .005$), anxiety (64.0% versus 51.1%, $P < .0001$), and suicide ideation (42.4% versus 29.0%, $P < .0001$). No difference was detected for PTSD, bipolar disorder, or suicide attempt. At the same time, LGBTQ+ cancer survivors were more likely to report current cocaine use (9.0% versus 2.0%, $P < .0001$), opioid use (8.5% versus 1.8%, $P < .0001$), amphetamine use (8.5% versus 5.2%, $P = .047$), benzodiazepine use (11.0% versus 3.0%, $P < .0001$; Table 2), and accidental overdose (24.0% versus 7.0%, $P < .0001$; Figure 1). However, no difference was observed regarding alcohol, marijuana, or nicotine product use.

Using multivariable logit models, cancer history was associated with an 8.1 to 19.1 percentage point increase in the probability of all discrimination, violence, and home-

TABLE 1.
Demographic Characteristics of LGBTQ+ Individuals by Cancer Diagnosis (N = 3170)

	History of Cancer (N = 200)		No History of Cancer (N = 2970)		P-value
	N	%	N	%	
Sexual orientation ^a					.003
Bisexual	41	20.5	738	24.9	-
Gay or lesbian	91	45.5	1029	34.7	-
Pansexual	36	18.0	471	15.9	-
Queer	15	7.5	457	15.4	-
Another orientation	17	8.5	275	9.3	-
Gender					< .0001
Cisgender woman	120	60.9	1330	45.0	-
Cisgender man	44	22.3	594	20.1	-
Non-binary or genderqueer	18	9.1	634	21.5	-
Transgender/multiple genders/another	15	7.6	395	13.4	-
Age at survey					< .0001
18-39	87	44.2	2423	82.7	-
40-64	93	47.2	454	15.5	-
65+	17	8.6	54	1.8	-
Race and ethnicity					.25
White	137	68.5	2032	68.4	-
Black	32	16.0	361	12.2	-
Hispanic/Latine/Latinx	14	7.0	224	7.5	-
Multi-racial/another race	17	8.5	353	11.9	-
Education					< .0001
High school or less	26	13.2	650	22.0	-
Some college	35	17.8	679	23.0	-
Associate or bachelor's degree	81	51.1	1151	39.0	-
Graduate degree	55	27.9	474	16.0	-
Yearly household income					.04
< \$25,000	37	18.8	696	23.7	-
\$25,000 - \$49,999	41	20.8	750	25.5	-
\$50,000 - \$74,999	40	20.3	590	20.1	-
\$75,000 - \$100,000	31	15.7	403	13.7	-
> \$100,000	48	24.4	498	17.0	-
Primary source of health insurance					< .0001
Private	105	52.5	1337	45.0	-
Public	36	18.0	305	10.3	-
Spouse or family member	19	9.5	883	29.7	-
Other insurance (VA/TRICARE)	16	8.0	132	4.4	-
Uninsured	15	7.5	243	8.2	-
Don't know	9	4.5	70	2.4	-
Rurality					.03
Big city	19	9.7	342	11.6	-
Medium city	48	24.5	848	28.8	-
Small city	52	26.5	628	21.4	-
Suburban	26	13.3	495	16.8	-
Small town	22	11.2	365	12.4	-
Rural area	29	14.8	263	8.9	-

Differences were assessed using Chi-Squared tests.

^a"Another orientation" included: asexual, questioning, straight (among transgender participants), and other written in orientations.

lessness outcomes. Among LGBTQ+ individuals in North Carolina, a cancer history was associated with an 8.1 (95% CI: 1.6, 14.5) percentage point increase in LGBTQ+ discrimination, a 15.1 (95% CI: 7.8, 22.5) percentage point increase in LGBTQ+ violence, a 16.7 (95% CI: 9.1, 24.1) percentage point increase in spouse or family violence, a 14.1 (95% CI: 6.0, 22.2) percentage point increase in sexual assault, and a 19.1 (95% CI: 11.6, 26.6; Table 3) percentage point increase in experiencing homelessness.

When assessing mental health outcomes, a history of cancer only had a significant association with reporting PTSD (AME: 8.9, 95% CI: 1.8, 16.0) among LGBTQ+ individuals in North Carolina. No other significant differences in mental health (i.e., depression, anxiety, bipolar, suicide ideation, sui-

TABLE 2.
Unadjusted Differences in Discrimination, Violence, Mental Health, and Substance Use Outcomes by Prior Cancer Diagnosis (N = 3170)

	History of Cancer (N = 200)		No History of Cancer (N = 2970)		P-value
	N	%	N	%	
Lifetime discrimination, violence, and housing					
LGBTQ+ discrimination	133	66.5	1863	62.7	.3
LGBTQ+ violence	66	33.0	692	23.3	.002
Spouse or family violence	101	50.5	1133	38.2	.001
Sexual assault	82	48.5	1052	39.6	.02
Experience of homelessness (last 12 months)	34	17.0	172	5.8	< .0001
Lifetime mental health	-	-	-	-	-
Depression	127	63.5	2158	72.7	.005
Anxiety	102	51.1	1901	64.0	< .0001
PTSD	61	30.5	808	27.2	.3
Bipolar	21	10.5	340	11.5	.7
Suicide ideation	58	29.0	1259	42.4	< .0001
Suicide attempt	37	18.5	641	21.6	.3
Current substance use and lifetime overdose					
Alcohol	129	64.5	2101	70.7	.06
Marijuana	79	39.5	1351	45.5	.1
Nicotine products	64	32.0	870	29.3	.4
Cocaine	18	9.0	58	2.0	< .0001
Opioids	17	8.5	54	1.8	< .0001
Amphetamines	17	8.5	155	5.2	.047
Benzodiazepines	22	11.0	88	3.0	< .0001
Accidental overdose (ever)	48	24.0	207	7.0	< .0001

Chi-squared tests were used to assess differences between individuals with and without a history of cancer and generate P-values.

Discrimination is defined as ever being discriminated on due to LGBTQ+ identity.

Violence is defined as ever experiencing physical or sexual violence because of LGBTQ+ identity.

Spouse or family violence is defined as interpersonal violence or violence from partner, family, or spouse.

Sexual assault is defined as ever experiencing sexual assault or unwanted sexual acts.

Homelessness is defined as not having a steady place to sleep or sleeping outside, at a shelter, or other place not meant for sleeping.

Substance use is defined as current some/everyday use.

cide attempt) were observed between LGBTQ+ individuals with and without a cancer history. Further, using multivariable logit models, a prior cancer history did not influence marijuana use among LGBTQ+ individuals. A cancer history was associated with an 8.8 percentage point lower probability (95% CI: -16.0, -1.6) of reporting alcohol use. However, when assessing other substance use outcomes, a prior cancer history was associated with a 9.0 (95% CI: 1.6, 16.5) percentage point increase in nicotine product use, a 8.9 (95% CI: 3.8, 14.1) percentage point increase in use of cocaine, a 7.4 (95% CI: 2.9, 11.8) percentage point increase in use of

opioids, a 6.0 (95% CI: 0.9, 11.0) percentage point increase in use of amphetamines, a 7.8 (95% CI: 3.0, 12.5) percentage point increase in use of benzodiazepines, and a 22.5 (95% CI: 15.2, 29.8) percentage point increase of accidental overdose.

When assessing the mental health coping strategies used by LGBTQ+ individuals with a history of cancer in this sample, the most common types of coping were talking with family and friends (46.5%), therapy or counseling (40.0%), use of prescription medications (40.0%), and exercise or outdoor activities (39.5%; Figure 2). However, notably, 21.0% of LGBTQ+ cancer survivors reported using alcohol,

TABLE 3.
Predicted Probabilities and Average Marginal Effect of Cancer History on Discrimination, Violence, Mental Health, and Substance Use Outcomes among LGBTQ+ Individuals (N = 3065)

	History of Cancer (N = 200)	No History of Cancer (N = 2970)	AME (95% CI)
	Predicted Probability (95% CI)	Predicted Probability (95% CI)	
Lifetime discrimination, violence, and housing			
LGBTQ+ discrimination	.705 [0.643, 0.768]	0.625 [0.608, 0.642]	0.081* [0.016, 0.145]
LGBTQ+ violence	0.383 [0.311, 0.455]	0.232 [0.217, 0.247]	0.151* [0.078, 0.225]
Spouse or family violence	0.548 [0.477, 0.619]	0.381 [0.364, 0.398]	0.167* [0.093, 0.241]
Sexual assault	0.536 [0.458, 0.614]	0.395 [0.377, 0.413]	0.141* [0.060, 0.222]
Experience of homelessness (last 12 months)	0.249 [0.174, 0.324]	0.058 [0.049, 0.066]	0.191* [0.116, 0.266]
Lifetime mental health			
Depression	0.725 [0.667, 0.783]	0.724 [0.709, 0.740]	0.001 [-0.060, 0.061]
Anxiety	0.607 [0.542, 0.673]	0.638 [0.622, 0.655]	-0.031 [-0.098, 0.037]
PTSD	0.360 [0.291, 0.430]	0.271 [0.256, 0.287]	0.089* [0.018, 0.160]
Bipolar	0.136 [0.081, 0.191]	0.114 [0.103, 0.126]	0.022 [-0.035, 0.078]
Suicide ideation	0.402 [0.330, 0.473]	0.420 [0.403, 0.437]	-0.019 [-0.092, 0.055]
Suicide attempt	0.263 [0.193, 0.332]	0.213 [0.199, 0.227]	0.050 [-0.021, 0.121]
Current substance use and lifetime overdose			
Alcohol	0.622 [0.553, 0.692]	0.710 [0.694, 0.726]	-0.088* [-0.160, -0.016]
Marijuana	0.468 [0.395, 0.541]	0.451 [0.434, 0.469]	0.017 [-0.059, 0.092]
Nicotine products	0.381 [0.308, 0.453]	0.290 [0.274, 0.306]	0.090* [0.016, 0.165]
Cocaine	0.109 [0.058, 0.160]	0.020 [0.015, 0.025]	0.089* [0.038, 0.141]
Opioids	0.092 [0.048, 0.136]	0.019 [0.014, 0.024]	0.074* [0.029, 0.118]
Amphetamines	0.109 [0.059, 0.159]	0.050 [0.042, 0.058]	0.060* [0.009, 0.110]
Benzodiazepines	0.108 [0.060, 0.155]	0.030 [0.024, 0.036]	0.078* [0.030, 0.125]
Accidental overdose (ever)	0.293 [0.220, 0.366]	0.068 [0.059, 0.077]	0.225* [0.152, 0.298]

Numbers with one asterisk () indicate statistical significance at the $P < 0.05$ level.

tobacco, or drugs to cope. Further, the most common barriers to mental health services among LGBTQ+ individuals with a history of cancer included cost barriers (36.0%), insurance barriers (33.5%), and barriers related to the unavailability of LGBTQ+-specific mental health services/trained professionals (21.5%; Figure 2).

Discussion

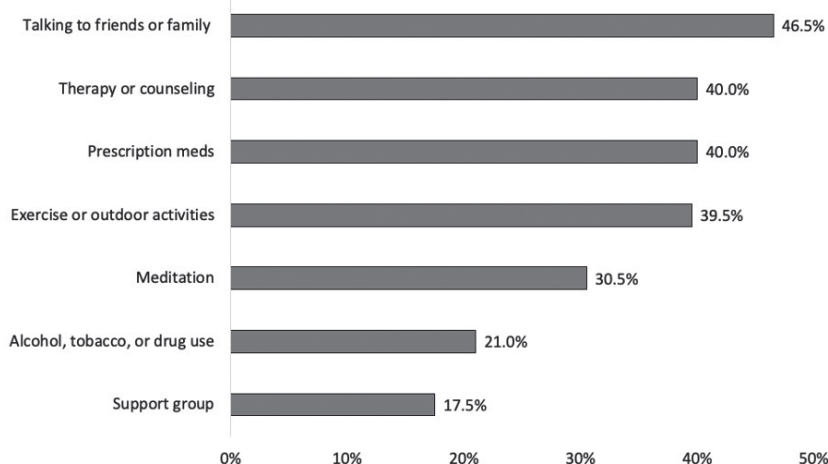
In this study, having had cancer was associated with a substantial percentage point increase in all discrimination and violence outcomes, as well as the use of most substances. At the same time, 1 in 5 LGBTQ+ cancer survivors reported using alcohol, tobacco, or drugs to cope with their mental health. The most frequently reported barriers to accessing mental health services were cost and insurance. While LGBTQ+ cancer survivors may not report mental health challenges more frequently than LGBTQ+ individu-

als without a cancer history, the increased probability of discrimination and violence may impact the severity of LGBTQ+ cancer survivors' existing mental health challenges. The impact of discrimination and violence on the severity of mental health outcomes may result in the increased experiences of homelessness, suicide attempts, substance use, and accidental overdose among LGBTQ+ cancer survivors in North Carolina. While LGBTQ+ cancer survivors in unadjusted analyses are less likely to report mental health challenges, no differences are observed in adjusted models, likely because age is a major driver of poor mental health in LGBTQ+ populations [20].

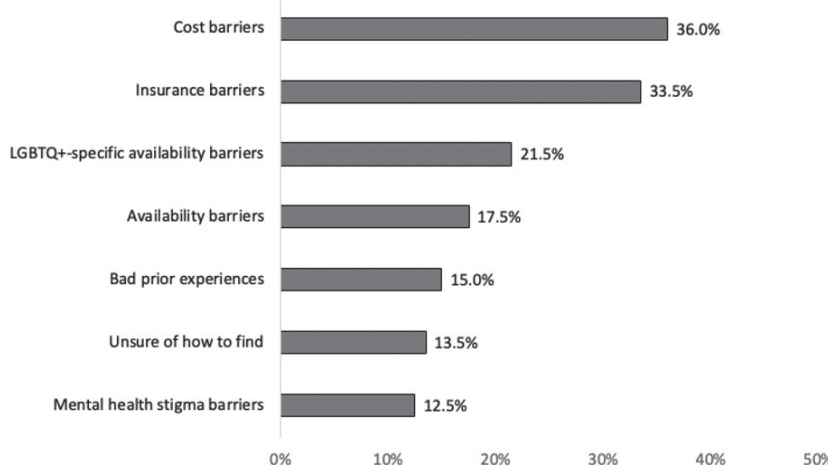
Over two-thirds of LGBTQ+ cancer survivors in this study reported discrimination, and one-half reported violence victimization (i.e., LGBTQ+ violence, spouse or family violence, and sexual assault). While, to our knowledge, no literature has assessed these outcomes among LGBTQ+ cancer sur-

FIGURE 2.
Mental Health Coping Strategies among LGBTQ+ Cancer Survivors in North Carolina
(N = 200)

A) Mental Health Coping (in the last 12 months)



B) Barriers to Mental Health Services (ever)



vivors specifically, the proportion of LGBTQ+ individuals reporting discrimination and violence is consistent and at times exceeds what is reported in the literature among LGBTQ+ populations in general [21, 22]. Finding higher rates of domestic violence among LGBTQ+ cancer survivors in comparison to LGBTQ+ individuals without a history of cancer is also consistent with the literature; a recent meta-analysis has linked cancer diagnosis with violence [23]. These findings in context suggest that LGBTQ+ cancer survivors experience unique risk factors for discrimination and violence that stem from both LGBTQ+ identity and the social and environmental contexts in which cancer and violence are more common.

In this study, LGBTQ+ cancer survivors were more likely to report PTSD, homelessness, the use of a variety of substances, and accidental overdose than LGBTQ+ individuals without a cancer history. LGBTQ+ cancer survivors in this study reported homelessness in the last 12 months at over double the proportion of those without a history of cancer. The proportion of LGBTQ+ individuals without a history of cancer reporting recent homelessness in this study is consistent with the literature [24]. The proportion of LGBTQ+ cancer survivors reporting prior suicide ideation or attempts is consistent with the literature among LGBTQ+ populations, while having ever accidentally overdosed was substantially higher than what is reported in the literature for cancer survivors and the general population [19, 25, 26]. Furthermore, the findings and the literature align in demonstrating that cancer survivors experience an increased use of substances, including illicit drugs [18]. These findings contextualized together suggest that the trauma of a cancer diagnosis in addition to the trauma resulting from discrimination and violence may have serious and life-threatening impacts on LGBTQ+ cancer survivors in North Carolina.

The findings of this survey point to two primary recommendations. First, we recommend improving access to affordable and LGBTQ+-friendly mental health services. Importantly, the proportion of LGBTQ+ cancer survivors who reported suicide ideation was nearly seven times the prevalence of thoughts of suicide among North Carolinians in 2021 [27]. In the context of the uninsurance rate of this sample (7.5%), our finding that insurance coverage and out-of-pocket costs being the most common barriers to mental health services suggests that the coverage LGBTQ+ cancer survivors do have is inadequate to access appropriate care. While psychosocial interventions have been observed to decrease symptoms of depression and anxiety among LGBTQ+ individuals, structural changes are needed to guarantee access to mental health services for LGBTQ+ cancer survivors [28]. Prior research has demonstrated that policy changes such as payment parity for telehealth services, authorization of audio-only services, and the ability to provide services across state lines increased access to virtual mental health services during COVID-19 [29]. However, a majority of individuals in the United States still face sub-

stantial barriers to accessing mental health services [30]. Research revolving around multi-level strategies to expand access to mental health services for LGBTQ+ cancer survivors is of the utmost importance in the context of the findings of this study. However, even if access is systematically expanded for LGBTQ+ cancer survivors, the availability of LGBTQ+-specific services may also be lacking [31].

Cancer centers, specifically in states that have high levels of anti-LGBTQ+ stigma like North Carolina, would benefit from accelerating the development and adoption of LGBTQ+ equity programming or the delivery of bundled interventions and services specific to the LGBTQ+ population. Our findings, combined with emergent literature, underscore the urgent need for cancer centers to cultivate a culture of safety and combat discrimination, violence, and minority stress among LGBTQ+ cancer populations [32]. Our findings align with the literature and suggest that caring for LGBTQ+ survivors should center on principles of trauma-informed care [33]. Our findings and the larger body of literature suggest that increased financial assistance for such programming is another critical component of increasing access to care [11, 34, 35]. Further, our findings and literature that has identified a need for substance use interventions for LGBTQ+ cancer survivors both suggest that healthy coping and harm reduction strategies may be particularly important to consider in the development of LGBTQ+ equity programming within cancer centers [36].

This study has several limitations. First, the use of data from a secondary needs assessment comes with limitations to generalizability inherent to all survey-based studies with convenience samples. Specifically, LGBTQ+ individuals recruited from Pride events may be more willing to disclose their identities and be more socially connected than LGBTQ+ individuals who do not attend Pride events. Therefore, LGBTQ+ individuals who participated in the needs assessment may have been more likely to report discrimination and violence outcomes and less likely to report mental health outcomes than LGBTQ+ individuals who did not. Further, all data were self-reported and may be biased due to recall and/or social desirability. The analysis is also limited by a lack of specific cancer-related information including treatments received and time since diagnosis. Further, we were unable to use reliable measures of rurality such as rural-urban commuting area (RUCA) codes, as zip codes were not collected. Lastly, many of the outcomes in this analysis are subject to the influence of social desirability, which may suggest under-reporting of some outcomes, such as substance use and mental health outcomes.

Conclusion

Due to anti-LGBTQ+ stigma and discrimination, many LGBTQ+ populations experience poor physical, mental, and financial health outcomes. Being diagnosed with cancer introduces another layer of health impacts that may worsen the health of LGBTQ+ cancer survivors. Findings

from this study, via the North Carolina LGBTQ+ Health Needs Assessment, revealed that LGBTQ+ cancer survivors were more likely to experience discrimination, violence, substance use, and overdose outcomes than LGBTQ+ individuals without a cancer history. These findings highlight a major gap in research and services aimed at understanding and preventing dangerous and often life-threatening outcomes among LGBTQ+ cancer survivors in North Carolina. **NCMJ**

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References

- Jones JM. LGBTQ identification in U.S. ticks up to 7.1%. *Gallup*. February 17, 2022. Accessed June 01, 2022. https://news.gallup.com/poll/389792/lgbt-identification-ticksup.aspx?utm_source=twitterbutton&utm_medium=twitter&utm_campaign=sharing
- Hatzenbuehler ML. Structural stigma and the health of lesbian, gay, and bisexual populations. *Current Directions in Psychological Science*. 2014;23(2):127-132. doi:10.1177/09637214145237
- Hatzenbuehler ML, Phelan JC, Link BG. Stigma as a fundamental cause of population health inequalities. *Am J Public Health*. 2013;103(5):813-821. doi:10.2105/AJPH.2012.301069
- Frey JJ, Hall WJ, Goldbach JT, Lanier P. "Here in the Bible Belt, it's predominantly negative": Sexual identity stigma in the American South, 50 years after Stonewall. *Front Psychol*. 2021;12:804064. doi:10.3389/fpsyg.2021.804064
- Haarmann L, Folkerts AK, Lieker E, et al. Comprehensive systematic review and meta-analysis on physical health conditions in lesbian and bisexual-identified women compared with heterosexual-identified women. *Womens Health (Lond)*. 2023;19:17455057231219610. doi:10.1177/17455057231219610
- Haarmann L, Lieker E, Folkerts AK, et al. Higher risk of many physical health conditions in sexual minority men: Comprehensive systematic review and meta-analysis in gay- and bisexual-identified compared with heterosexual-identified men. *LGBT Health*. 2024;11(2):81-102. doi:10.1089/lgbt.2023.0084
- Rich AJ, Scheim AI, Koehoorn M, Poteat T. Non-HIV chronic disease burden among transgender populations globally: A systematic review and narrative synthesis. *Prev Med Rep*. 2020;20:101259. doi:10.1016/j.pmedr.2020.101259
- Wittgens C, Fischer MM, Buspavanich P, Theobald S, Schweizer K, Trautmann S. Mental health in people with minority sexual orientations: A meta-analysis of population-based studies. *Acta Psychiatr Scand*. 2022;145(4):357-372. doi:10.1111/acps.13405
- Lee Badgett MV, Carpenter CS, Sansone D. LGBTQ economics. *J Economic Perspectives*. 2021;35(2):141-170. doi:10.1257/jep.35.2.141
- Waters AR, Jin M, Jones SR, et al. Chronic health conditions, disability, and physical and cognitive limitations among LGBTQ+ cancer survivors. *Cancer Epidemiol Biomarkers Prev*. 2024;33(11):1405-143. doi: 10.1158/1055-9965.EPI-24-0166
- Waters AR, Bybee S, Warner EL, Kaddas HK, Kent EE, Kirchhoff AC. Financial burden and mental health among LGBTQIA+ adolescent and young adult cancer survivors during the COVID-19 pandemic. *Front Oncol*. 2022;12:832635. doi:10.3389/fonc.2022.832635
- Li M, Chau K, Calabresi K, et al. The effect of minority stress processes on smoking for lesbian, gay, bisexual, transgender, and queer individuals: A systematic review. *LGBT Health*. Published online April 1, 2024. 2024;11(8):583-605. doi:10.1089/lgbt.2022.0323
- Chien YS, Schwartz G, Huang L, Kawachi I. State LGBTQ policies and binge drinking among sexual minority youth in the US: A multilevel analysis. *Soc Psychiatry Psychiatr Epidemiol*. 2022;57(1):1-12. doi:10.1007/s00127-021-02119-4
- Brooks VR. *Minority Stress and Lesbian Women*. Lexington Books; 1981.
- National Institute of Health Sexual & Gender Minority Research Office. The Sexual & Gender Minority Health Disparities Framework. 2021. https://dpcpsi.nih.gov/sites/default/files/NIH-SGM-Health-Disparities-Research-Framework-FINAL_508c.pdf
- Frost DM, Meyer IH. Minority stress theory: Application, critique, and continued relevance. *Curr Opin Psychol*. 2023;51:101579. doi:10.1016/j.copsyc.2023.101579
- Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull*. 2003;129(5):674-697. doi:10.1037/0033-2909.129.5.674
- Ji X, Cummings JR, Mertens AC, Wen H, Effinger KE. Substance use, substance use disorders, and treatment in adolescent and young adult cancer survivors—Results from a national survey. *Cancer*. 2021;127(17):3223-3231. doi:10.1002/cncr.33634
- Lu D, Fall K, Sparén P, et al. Suicide and suicide attempt after a cancer diagnosis among young individuals. *Ann Oncol*. 2013;24(12):3112-3117. doi:10.1093/annonc/mdt415
- Russell ST, Fish JN. Mental health in lesbian, gay, bisexual, and transgender (LGBT) youth. *Annu Rev Clin Psychol*. 2016;12:465-487. doi:10.1146/annurev-clinpsy-021815-093153
- Barrett BJ. Domestic violence in the LGBT community. *Encyclopedia of Social Work*. 2015. doi:10.1093/acrefore/9780199975839.013.1133
- Fredriksen-Goldsen K, Prasad A, Kim HJ, Jung H. Lifetime violence, lifetime discrimination, and microaggressions in the lives of LGBT midlife and older adults: Findings from aging with pride: National health, aging, and sexuality/gender study. *LGBT Health*. 2023;10(S1):S49-S60. doi:10.1089/lgbt.2023.0139
- Reingle Gonzalez JM, Jetelina KK, Olague S, Wondrack JG. Violence against women increases cancer diagnoses: Results from a meta-analytic review. *Prev Med*. 2018;114:168-179. doi:10.1016/j.ypmed.2018.07.008
- Wilson BDM, Kyu Choi S, Harper GW, Lightfoot M, Russell S, Meyer IH. Homelessness among LGBT adults in the US. Williams Institute, University of California Los Angeles School of Law. 2020. <https://williamsinstitute.law.ucla.edu/wp-content/uploads/LGBT-Homelessness-May-2020.pdf>
- Ahmad FB, Cisewski JA, Rossen LM, Sutton P. Provisional drug overdose death counts. Centers for Disease Control; National Center for Health Statistics. 2024. www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm
- Meyer IH, Russell ST, Hammack PL, Frost DM, Wilson BDM. Minority stress, distress, and suicide attempts in three cohorts of sexual minority adults: A U.S. probability sample. *PLOS One*. 2021;16(3):e0246827. doi:10.1371/journal.pone.0246827
- Reinert M, Fritze D, Nguyen T. The state of mental health in America 2022. Mental Health America. 2021. <https://mhanational.org/sites/default/files/2022%20State%20of%20Mental%20Health%20in%20America.pdf>

28. Yang Y, Ye Z, Li W, Sun Y, Dai L. Efficacy of psychosocial interventions to reduce affective symptoms in sexual and gender minorities: A systematic review and meta-analysis of randomized controlled trials. *BMC Psychiatry*. 2024;24(1):4. doi:10.1186/s12888-023-05451-y
29. McBain RK, Schuler MS, Qureshi N. Expansion of telehealth availability for mental health care after state-level policy changes from 2019 to 2022. *JAMA Netw Open*. 2023;6(6):e2318045. doi:10.1001/jamanetworkopen.2023.18045
30. Reisinger Walker E, Cummings JR, Hockenberry JM, Druss BG. Insurance status, use of mental health services, and unmet need for mental health care in the United States. *Psychiatr Serv*. 2015;66(6):578-584. doi:10.1176/appi.ps.201400248
31. Williams ND, Fish JN. The availability of LGBT-specific mental health and substance abuse treatment in the United States. *Health Serv Res*. 2020;55(6):932-943. doi:10.1111/1475-6773.13559
32. Diamond LM, Alley J. Rethinking minority stress: A social safety perspective on the health effects of stigma in sexually-diverse and gender-diverse populations. *Neurosci Biobehav Rev*. 2022;138:104720. doi:10.1016/j.neubiorev.2022.104720
33. Sinko L, Ghazal LV, Fauer A, Wheldon CW. It takes more than rainbows: Supporting sexual and gender minority patients with trauma-informed cancer care. *Cancer*. 2024;130(4):507-516. doi:10.1002/cncr.35120
34. Ou JY, Waters AR, Kaddas HK, et al. Financial burdens during the COVID-19 pandemic are related to disrupted healthcare utilization among survivors of adolescent and young adult cancers. *J Cancer Surviv*. 2023;17(6):1571-1582. doi:10.1007/s11764-022-01214-y
35. Waters AR, Easterly CW, Turner C, et al. LGBTQ+ inequity in crowdfunding cancer costs: The influence of online reach and LGBTQ+ state policy. *Cancer Med*. 2024;13(3):e6926. doi:10.1002/cam4.6926
36. Webster R, Drury-Smith H. How can we meet the support needs of LGBT cancer patients in oncology? A systematic review. *Radiography (Lond)*. 2021;27(2):633-644. doi:10.1016/j.radi.2020.07.009

APPENDIX.
Survey Questions for Each Outcome

Discrimination, Violence, and Housing

At any point in your life have you experienced discrimination based on your LGBTQ status?

- ☐ Yes
- ☐ No

At any point in your life have you experienced physical and/or sexual violence based on your LGBTQ status?

- ☐ Yes
- ☐ No

At any point in your life have you experienced violence from a family member, partner, or spouse?

- ☐ Yes
- ☐ No

Has anyone ever had sex with you after you said or showed that you didn't want them to?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

In the last 12 months, have you experienced any of the following?

- ☐ I did not have a steady place to live
- ☐ I slept outside, in a shelter, or in a place not meant for sleeping

Lifetime Mental Health

Have you ever had any of the following mental health issues?

- ☐ Depression
- ☐ Thinking about killing yourself
- ☐ Attempting to kill yourself
- ☐ Bipolar disorder
- ☐ PTSD
- ☐ Anxiety disorder
- ☐ Gender dysphoria
- ☐ Substance use disorder
- ☐ Eating disorder
- ☐ Adjustment disorder
- ☐ None of these

Have you faced any of the following barriers to accessing mental health services? (check all that apply)

- ☐ Lack of health insurance
- ☐ Health insurance not covering much for mental health services
- ☐ Mental health professionals not taking certain insurance plans
- ☐ Cost of mental health services
- ☐ Not knowing how to find mental health services
- ☐ Lack of mental health professionals in my area
- ☐ Lack of LGBTQ+ affirmative mental health professionals in my area
- ☐ Self-consciousness or embarrassment about having a mental health problem
- ☐ Bad past experiences with mental health professionals
- ☐ I haven't faced any barriers

Current Substance Use and Lifetime Overdose

Do you ever smoke, vape, dip or use nicotine pouches?

- ☐ Yes
- ☐ No

How often do you use these substances

	Never	Some Days	Everyday
Alcohol	☐	☐	☐
Marijuana	☐	☐	☐
Cocaine/Crack	☐	☐	☐
Opioids, such as heroin, oxycontin, fentanyl	☐	☐	☐
Amphetamines	☐	☐	☐
Benzos	☐	☐	☐

If you have experienced an overdose, how recently did the overdose occur?

- ☐ Within the past 6 months
- ☐ 6 months- 1 year
- ☐ 1-5 years
- ☐ More than 5 years ago
- ☐ I have never experienced an overdose