

Correlation Between LGBTQ Individuals and Adverse Childhood Experiences (ACEs)

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Introduction:

The correlation between LGBTQ+ (lesbian, gay, bisexual, transgender, and queer) identities and adverse childhood experiences (ACEs) represents an area of research in understanding the challenges faced by sexual and gender minorities. Adverse childhood experiences are the various forms of abuse, neglect, and household dysfunction that have lasting impacts on an individual's mental and physical health. These experiences can lead to a higher risk of developing mental health disorders, engaging in substance use, and encountering other health-related issues later in life.

LGBTQ+ individuals often face the burden of their childhood and stress relating to their sexual orientation or gender identity. They also experience discrimination, stigma, and family rejection. Research shows that LGBTQ+ individuals report higher rates of ACEs compared to heterosexuals and cisgender individuals.

Understanding how ACEs affect the LGBTQ+ community is extremely important for many reasons. It acknowledges and addresses the issues of how mental and physical health harm the people in this community. It also informs people about what is happening and how they can help. It brings attention to how important it is to support the community, reducing the impact of ACEs.

The Behavioral Risk Factor Surveillance System (BRFSS) is a survey system that collects data on health-related risk behaviors, chronic health conditions, and the use of preventive services among U.S. adults. It was established by the Centers for Disease Control and Prevention (CDC) in 1984. BRFSS is the world's largest continuously conducted health survey system, with data collected monthly from over 400,000 adult participants annually. This data set is valuable for research on adverse childhood experiences (ACEs) among LGBTQ individuals

due to its extensive coverage and inclusion of modules specifically designed to assess ACEs and sexual orientation. The survey includes questions on health topics, physical and mental health, healthcare access, and substance use. Importantly, the ACEs module in the BRFSS collects detailed information on participants' experiences of abuse, neglect, and household dysfunction during childhood.

For studies focusing on the correlation between LGBTQ identities and ACEs, the BRFSS provides critical insights by allowing researchers to analyze the prevalence and impact of ACEs across different sexual orientations and gender identities. The large sample size and high response rate enhance the reliability and generalizability of findings derived from this data set. Additionally, the public availability of BRFSS data facilitates transparency and replication of research, supporting the development of evidence-based interventions and policies aimed at addressing the unique challenges faced by LGBTQ individuals.

Literature Review:

The first study investigated the disparities in ACEs among sexual minorities and heterosexual adults using data from a multistate probability sample. The methodology used by this author was logistic regression analysis on ACEs, using data from the Behavioral Risk Factor Surveillance System, also known as BRFSS (Andersen and Blosnich (2013). This study's findings were that LGBTQ+ individuals have higher odds of experiencing ACEs, like physical abuse, sexual abuse, and household dysfunction, compared to heterosexual individuals. Unfortunately, some of the challenges faced by this study were needing a larger sample size and more details on the data. More information on the type of ACE these individuals face can better explain the odds and results shown.

The second study explores the effects of victimization on mental health among LGBTQ adolescents and young adults. The researchers used longitudinal data and employed a structural equation modeling to assess the relationships between victimization, mental health outcomes, and substance use (Mustanski, Andrews, and Puckett 2016). The study found that LGBTQ youth experience multiple forms of victimization, including ACEs. Individuals were at higher risk for mental health disorders and substance use. The authors noted how there were difficulties in disentangling the effects of specific types of ACEs from general victimization experiences.

The third study examines the impact of family acceptance and rejection on the health outcomes of LGBTQ young adults. The methodology used was in-depth interviews and surveys, the researchers analyzed the relationship between family reactions to sexual orientation or gender identity disclosure and various health outcomes (Ryan et al. 2009). The findings of this study were high levels of family rejection during adolescence and association with increased ACEs and negative mental health outcomes, including higher rates of depression and suicidality. The

challenge this study faced was remembering the importance of longitudinal data so we could fully capture the long-term effects of family rejection.

The fourth study investigated the prevalence of trauma and its association with PTSD among sexual minority adults. Researchers used survey data and logistic regression analysis. The study also examines the impact of cumulative trauma, including ACEs, on PTSD rates (Roberts et al. 2010). This study showed how LGBTQ individuals reported higher levels of trauma exposure and were more likely to develop PTSD compared to their heterosexual counterparts. The challenge faced was realizing how there is not enough trauma-informed care tailored specifically to the needs of LGBTQ populations.

This fifth study utilizes a cross-sectional survey to look into self-identifying LGBTQ+ and adverse childhood experiences. They found that those who were gender non-conforming, pansexual, and transgender who identified as American-Indian, Latinx, and rural youth had significantly high adverse childhood experiences when compared to those who lived in Canada, lived with a parent, or had highly educated parents had fewer. The future goal of this study is to provide data that would aid in the effectiveness and creation of clinical interventions. Some interesting findings are the correlation between already having one ACE and making one more likely to have another (Craig, Austin, and Levenson 2020).

This sixth study used a cross-sectional design with a focus on sexual and gender minorities and their risk of adverse childhood experiences and substance misuse. Part of the methodology was to look at studies in different research journals and sources. These were then compiled into twenty reports to be reviewed. The matrix method was used to analyze and sort the data allowing researchers to look into substance use frequency, quantity, problems, and disorders (Dowling, Grisby, and Ziomek 2023). The study found that additional adverse childhood

experiences were connected to increased odds of cigarette use and those who were sexual and gender minorities had a higher prevalence of cigarette use over the past 30 days than their non-sexual gender minority peers. This meta-review lists the many findings of these different articles and compiles the research.

Results:

Conclusion:

To explain what we did in each part of our code, starting with `brfss22 %>%`: This takes the dataset `brfss22` and pipes it into the next function. While using the code `summarize(across(...))`: to create a summary of the dataset. The “across” function is used to apply a function to multiple columns. Using the `starts_with("ace")`: we were able to select all columns in the dataset whose names start with "ace". This function calculates the number of non-missing (non-NA) values for each of these columns, creating a logical vector where TRUE represents non-missing values and `sum(...)` counts these TRUE values. This code results in a summary table `ace_summary` that contains the count of non-missing values for each variable in `brfss22` whose name starts with "ace". ("`smoke100`", "`smokday2`", "`ecignow2`", "`alcdays4`", "`avedrnk3`", "`drnk3ge5`", "`marijan1`"): are columns related to substance use and we calculate the number of non-missing (non-NA) values. This code results in a summary table `substance_summary` that contains the count of non-missing values for each specific substance use variable in `brfss22`. Using the code `ace_summary`: the table tells us how many non-missing values there are for each Adverse Childhood Experience (ACE) variable in the dataset. This is useful to understand the completeness of data for ACE-related questions. While `substance_summary`: provides the count of non-missing values for each substance use variable

listed. This helps in assessing the data completeness for substance use-related questions. Both summary tables give a quick overview of the data availability for the specified sets of variables in the brfss22 dataset. This is important for understanding the coverage and potential gaps in the dataset before proceeding with further analysis.

The line `total_population <- nrow(brfss22)` calculates the total number of rows (observations) in the dataset brfss22 and assigns this value to the variable `total_population`. This represents the total number of respondents in the brfss22 dataset. Using `total_population` in conjunction with the summary tables (`ace_summary` and `substance_summary`) can help provide context to the data completeness. The next code creates a new data frame `brfss22_ace_binary` where specific Adverse Childhood Experience (ACE) variables from the brfss22 dataset are converted into binary values (TRUE or FALSE). The result is a new data frame `brfss22_ace_binary` where each specified ACE variable is transformed into a binary format, making it easier to perform further analyses that require binary (TRUE/FALSE). From this, we learn that all the data came out to be true. The dataset brfss22 contains 445,132 rows and 68 columns. Among these columns, two are `X_STATE` and `X_METSTAT`. The snippet shows the first few rows for these columns, highlighting the state and metropolitan status of the respondents. We learn that TRUE if the value is "Metropolitan counties" and FALSE if the value is "nonmetropolitan counties".

After finding the standard error, z-value, and p-value we can interpret what the data means:

The estimated coefficient on `acedeprsTRUE` indicates that individuals affected by adverse childhood experiences (family members with depression, mental illness, or suicidal

ideation) have an estimated decrease of about 0.19 units in the log odds of smoke100 being "yes" compared to unaffected individuals. This coefficient is highly significant, indicating a significant negative association between adverse childhood experiences and smoke100.

The estimated coefficient on acedrinkTRUE indicates that individuals affected by adverse childhood experiences (problem drinkers or alcoholic family members) have an estimated increase of about 0.33 units in the log odds of smoke100 being "yes" compared to unaffected individuals. This coefficient is highly significant, indicating a significant positive association between adverse childhood experiences and smoke100.

Individuals affected by adverse childhood experiences (living with a family member who abused illegal drugs or prescription drugs) have an increase of about 0.40 units in the estimated log odds of smoke100 being "yes" compared to unaffected individuals. This coefficient is highly significant, indicating a significant positive association between adverse childhood experiences and smoke100.

Individuals affected by adverse childhood experiences (having a family member who has served a sentence or has been sentenced to a prison, detention center, or other correctional facility) have an increase of about 0.09 units in the estimate of the log odds of smoke100 being "yes" compared to unaffected individuals. The coefficient has a significance level of 0.0337, which is slightly lower than the usual significance level of 0.05, but it can still be considered a significant positive correlation.

Individuals affected by adverse childhood experiences (parental separation or divorce) have an estimated increase of about 0.23 units in the log odds of smoke100 being "yes" compared to unaffected individuals. This coefficient is highly significant, indicating a significant positive association between adverse childhood experiences and smoke100.

Individuals affected by an adverse childhood experience (having experienced sexual assault or harassment) have an estimated increase of about 0.28 units in the log odds of smoke100 being "yes" compared to unaffected individuals. This coefficient is highly significant, indicating a significant positive association between adverse childhood experiences and smoke100.

None of the remaining results were significant. Considering these results together, we can assume that adverse childhood experiences have some predictive power for smoking behavior. However, different childhood experiences may have various degrees of influence on an individual's smoking behavior, and not all ACE factors have a significant effect on smoking behavior, which requires careful consideration of an individual's background characteristics and other possible influencing factors. The relationship between ECIGNOW2 (e-cigarette use) and ACE (Adverse Childhood Experiences) was assessed based on the results of logistic regression modeling. The results showed that no significant associations with e-cigarette use were observed for all factors involved in Adverse Childhood Experiences (ACE), including depression, mental illness, alcoholism, substance abuse, incarceration, parental separation, domestic violence, and sexual abuse by family members. All of the estimated coefficients had p-values above the significance level ($\alpha = 0.05$), indicating that there was no significant relationship between these

factors and e-cigarette use. Therefore, based on these modeling results, we did not find evidence to support an association between adverse childhood experiences and e-cigarette use.

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