**Selected Topics-Public Health**

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**Course:** Selected Topics-Public Health (PUBH-5357-001 CRN:27784)

**Date of Submission:** 05/15/2025

**1.0 INTRODUCTION**

***1.1 Approach and background of the Project***

This capstone project, conducted in fulfillment of the requirements for Selected Topics-Public Health, investigates mental health outcomes among gay and bisexual men, focusing on depression severity and associated risk factors. The early 2000s marked a challenging period for this population, with pervasive societal stigma and the lingering impact of the HIV/AIDS crisis contributing to elevated mental health risks. Studies from that era indicate that gay and bisexual men experienced significantly higher rates of depression compared to their heterosexual counterparts, often due to minority stress and discrimination (Meyer, 2003). In 2000, the prevalence of major depression among gay men was estimated to be nearly double that of the general population, with social isolation and lack of support exacerbating these issues (Cochran & Mays, 2000).

The project utilized the "Mental Health Concerns of Gay and Bisexual Men Seeking Mental Health Services, 2000 [United States]" dataset, a publicly accessible dataset obtained from the ICPSR warehouse, hosted by the Inter-university Consortium for Political and Social Research (ICPSR, 2000). This dataset includes data on 148 men who sought mental health services during a pivotal time in LGBT history. To analyze this data, the project was conducted using R, a powerful statistical programming language, with the assistance of Google Colab’s Jupyter Notebook service, which provided a collaborative and accessible platform for coding and visualization.

This project report is presented in a structured format to provide a comprehensive overview of the work. It begins with an introduction, which sets the approach and objectives, followed by the Methods section, detailing the analytical approach. The Results section presents the findings from the analyses, leading into the Discussion, where the implications and limitations are explored. Finally, the report concludes with my reflections on the capstone project and my overall learning derived from working and learning with tools that were utilized for this project.

***1.2 Project Objectives***

My primary goal was to understand the prevalence and distribution of depression severity within this group of 148 men who sought help in 2000, a period marked by significant social challenges, while also exploring broader patterns in mental health concerns across the study sample. I wanted to investigate whether certain life experiences and personal histories might be linked to severe depression. Additionally, I sought to explore how these concerns align with or differ from what is known in contemporary literature, considering the data was collected over two decades ago. Since 2000, there have been significant advancements in research on LGBT populations, particularly in understanding mental health outcomes and the impact of societal acceptance (Hatzenbuehler et al., 2010). The project was structured to progress from basic descriptive insights to more complex statistical analyses, with the aim of identifying potential risk factors that could inform mental health support strategies. Through this work, I hoped to contribute to a deeper understanding of the historical context shaping these men’s experiences, while recognizing the data’s limitations.

***1.3 FAIR Principles & Our Project***

The FAIR principles—Findable, Accessible, Interoperable, and Reusable, provide a framework for ensuring data can be effectively used and shared in research (Wilkinson et al., 2016). The "Mental Health Concerns of Gay and Bisexual Men Seeking Mental Health Services, 2000" dataset, sourced from the ICPSR warehouse, reflects these principles to varying degrees.

**Findability:** is well-supported the dataset is indexed in ICPSR’s searchable catalog with a unique identifier, detailed metadata, and a clear description, making it easy to locate.

**Accessibility**: the dataset is publicly available, allowing retrieval after agreeing to ICPSR’s terms of use, ensuring broad access for researchers.

**Interoperability:** presented challenges; non-standard missing value codes (e.g., 999, 888) required cleaning in R to align with standard formats, highlighting a limitation in seamless integration with other datasets. Data was also only available to download in SPSS formats and SAS formats.

**Reusability**: is partially met, ICPSR provides a codebook and methodology, but data quality issues, such as 43 missing values in age-related variables and questionable entries (e.g., age at LGBT awareness of 1), may hinder reuse without further documentation.

**2.0 METHODS**

***2.1 Dataset Description***

This project utilized the "Mental Health Concerns of Gay and Bisexual Men Seeking Mental Health Services, 2000 [United States]" dataset, a publicly accessible resource obtained from the ICPSR warehouse (ICPSR, 2000). The dataset comprises data from 148 gay and bisexual men who sought mental health services, offering insights into their mental health status during a period marked by significant social challenges. It includes a range of variables related to mental health outcomes, life experiences, and demographic factors, providing a valuable snapshot for this study.

***2.2 Data Preparation***

The dataset was initially available for download only in SPSS and SAS formats, so I downloaded a .sav file from the ICPSR warehouse. To work with it in Jupyter Notebook, I imported the .sav file and used the write.csv command in R to convert it into a CSV format for easier analysis. Further preparation involved addressing inconsistencies: non-standard missing value codes (e.g., 999, 888) were replaced with NA, and variables were transformed into appropriate formats, such as factors for categorical data, to ensure accuracy and compatibility for statistical modeling.

***2.3 Data Analysis***

The statistical analysis was conducted in three distinct phases to explore mental health patterns comprehensively. First, descriptive statistics, including frequency tables and percentage distributions, summarized the prevalence and distribution of mental health outcomes across the sample. Second, bivariate analyses employed correlation tests (e.g., Spearman’s rank correlation) to examine relationships between key variables, providing initial insights into potential associations. Third, univariate logistic regression models were fitted to assess whether specific life experiences predicted severe mental health outcomes, with results visualized using a forest plot to display odds ratios (ORs) and 95% confidence intervals (CIs). The analysis process also involved iterative model fitting in R, checking for convergence and data fit, and interpreting results. A p-value rejection criterion of 0.05 was adopted, meaning associations were considered statistically significant only if the p-value was less than 0.05, aligning with standard statistical practice in public health research (Field, 2018). This multi-phase approach aimed to uncover meaningful patterns and risk factors while addressing data limitations.

***2.4 Data Ethics***

Ethical considerations were key due to the sensitive mental health data from 148 gay and bisexual men. The anonymized dataset from ICPSR (2000) ensured confidentiality, and I adhered to its terms by using it solely for academic purposes, storing it securely on Google Colab, and analyzing data in aggregate to protect privacy, following public health ethics guidelines (Beauchamp & Childress, 2019).

**3.0 ANALYSIS & RESULTS**

***3.1 Descriptive Statistics***

The sample consisted of 148 gay and bisexual men seeking mental health services. Of the total participants, 95.9% identified as gay and 4.1% identified as bisexual. Regarding HIV status, 37.8% reported a positive HIV status, 27.0% reported a negative status, and 35.1% were unsure of their status.

Commonly reported mental health concerns included mood disorders (36.1%), anxiety (24.3%), relationship issues (16.9%), other psychological problems (14.4%), and substance use problems (8.3%). Depression severity was reported among all participants, with 53.4% classified as having moderate depression and 16.2% as having severe depression.

***3.2 Bivariate Associations***

* Depression severity and HIV status were significantly associated (p = 0.034), with variation in depression levels across HIV status categories.
* History of substance use, and history of physical abuse showed a significant association (p = 0.015), with differing substance use proportions between those with and without physical abuse history.
* Depression severity and history of physical abuse were also significantly associated based on Fisher’s Exact Test (p = 0.030).
* A linear regression analysis identified a statistically significant correlation between age at LGBT awareness and age at intake (β = 0.253, p = 0.002).

***3.3 Multiple Linear Regression***

A multiple linear regression was conducted to examine the association between age at LGBT awareness (dependent variable) and three predictors: age at intake, history of physical abuse, and history of emotional abuse.

| **Predictor** | **β Coefficient** | **p-value** |
| --- | --- | --- |
| Age at Intake | 0.253 | 0.002 |
| History of Physical Abuse | -1.019 | 0.462 |
| History of Emotional Abuse | 0.233 | 0.864 |

Model fit statistics:

* R = 0.287
* R² = 0.082
* Overall model *p* = 0.015

***4.4 Multiple Logistic Regression***

A multiple logistic regression model was fit to predict severe depression (vs. non-severe) using history of emotional abuse, sexual abuse, physical abuse, and history of substance use as predictors.

| **Predictor** | **Odds Ratio (95% CI)** |
| --- | --- |
| Emotional Abuse | 1.58 (0.65–3.84) |
| Sexual Abuse | 0.67 (0.21–1.81) |
| Physical Abuse | 1.75 (0.69–4.27) |
| Ever Had Substance Abuse | 2.02 (0.84–5.15) |

**4.0 DISCUSSION**

The findings from this study, which analyzed data from a sample of 148 gay and bisexual men seeking mental health services, revealed several significant bivariate associations and patterns across mental health indicators, abuse history, and substance use behaviors. However, these results must be interpreted with caution due to both the age of the dataset and the small sample size.

The data were collected in the year 2000, over two decades ago. During that time, the social and political climate surrounding LGBT identity, mental health, and HIV-related stigma differed substantially from today. Shifts in public attitudes, improvements in mental health and HIV care, and increased societal acceptance of sexual minorities may influence how these associations would manifest in a more contemporary sample. Therefore, while the patterns observed are noteworthy, they may not fully reflect present-day experiences of gay and bisexual men seeking mental health services.

One significant association was observed between HIV status and depression severity, where participants living with HIV appeared more likely to report moderate depression. This aligns with established literature suggesting that managing a chronic condition such as HIV can increase vulnerability to mental health concerns. Similarly, participants with a history of physical abuse were more likely to report substance use problems and severe depression, echoing the well-documented link between early-life trauma and adverse psychological outcomes in sexual minority populations.

In the multiple linear regression model, age at intake was the only significant predictor of age at LGBT awareness, indicating that older individuals tended to report later realization of their sexual identity. However, the model’s explanatory power was limited (R² = 0.082), and neither history of physical abuse nor emotional abuse significantly predicted LGBT awareness age. This may be due in part to the modest sample size, which limits statistical power and may obscure true associations.

The logistic regression model examining predictors of severe depression found no statistically significant predictors, although the direction of effects was consistent with theoretical expectations. The strongest observed association was between substance use history and severe depression (OR = 2.02), suggesting that individuals with past substance use may face greater mental health burdens. Nevertheless, the wide confidence intervals and lack of statistical significance for all predictors underscore the limitations of small sample size, which restricts generalizability and precision.

In summary, the findings support existing frameworks linking trauma, HIV status, and substance use with mental health outcomes among sexual minority men. However, the dated nature of the data and limited statistical power highlight the need for updated and larger-scale studies to better understand the evolving mental health needs of this population. Future research should prioritize intersectional approaches, incorporate contemporary measures, and explore protective factors that have emerged in recent years.

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