UNDERSTANDING MENTAL HEALTH OUTCOMES IN U.S. UNDERGRADUATE STUDENTS: A COMPARATIVE AND PREDICTIVE STUDY OF SEXUAL AND GENDER MINORITY (SGM) AND NON-SGM STUDENTS

by

BROOKE SELIK GOLGIRI

A dissertation submitted in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY IN NURSING

2026

Oakland University
Rochester, Michigan

Doctoral Advisory Committee:

Suha Kridli, Ph.D., RN, Chair
Julie Kruse, Ph.D., RN
Laura Pittiglio, Ph.D., RN
Kyle Moxley, Ph.D.

To my brother, Nikk, and all the other folks like him who have dared to live as their most authentic selves. Know that you are seen, you are heard, and you are loved.

ACKNOWLEDGMENTS

I would like to thank my dissertation committee: Dr. Suha Kridli, Dr. Julie Kruse, Dr. Laura Pittiglio, and Dr. Kyle Moxley, for their dedication to this project. I could not have made it through this journey without their guidance and assistance. I am also grateful for the American College Health Association for collecting this data and allowing me access to it for my dissertation. I would like to thank my family and friends for encouraging me to keep going even when it felt nearly impossible. I am especially grateful for my husband, Hamid, who supported me mentally and emotionally from start to finish as we were simultaneously navigating our growing relationship and its milestones. His on-demand pep talks and warm hugs gave me the strength to carry on.

ABSTRACT

UNDERSTANDING MENTAL HEALTH OUTCOMES IN U.S. UNDERGRADUATE STUDENTS: A COMPARATIVE AND PREDICTIVE STUDY OF SEXUAL AND GENDER MINORITY (SGM) AND NON-SGM STUDENTS

by

BROOKE SELIK GOLGIRI

Adviser: Suha Kridli, Ph.D., RN

Sexual and gender minority (SGM) college students continue to report higher levels of negative mental health outcomes than their heterosexual, cisgender peers. Many studies have relied on participants' self-report of mental health outcomes rather than utilizing validated instruments designed to identify and assess these outcomes as well as the factors influencing them. Therefore, utilizing validated mental health instruments administered through a national survey of college students, the purpose of this study was twofold: first, to compare the overall mental health of SGM and non-SGM undergraduate students in the U.S., and second, to identify factors that predict mental health outcomes among undergraduate students in the U.S. This study was a secondary analysis of data collected by the American College Health Association National College Health Assessment III (ACHA NCHA III). Independent samples *t*-tests were used to compare levels of negative and positive mental health outcomes as well as mental health risk factors and protective factors between SGM and non-SGM students. Analyses showed significantly higher levels of negative mental health outcomes and mental health risk factors, as well as significantly lower levels of positive mental health outcomes and

mental health protective factors, for SGM students compared to non-SGM students. Regression analyses were used to determine the extent to which various factors predict mental health outcomes in undergraduate students. Results indicated that loneliness and diminished resilience were the strongest predictors of psychological distress, SGM status and loneliness were the strongest predictors of suicide risk, and resilience and diminished loneliness were the strongest predictors of psychological well-being in SGM undergraduate students. These findings were supported by existing research. Future studies would benefit from examining within-group differences among sexual minority and gender minority subgroups in order to develop appropriately tailored interventions. Additional research through the lens of intersectionality could also provide a more detailed picture of mental health outcomes in undergraduate college students and the factors affecting them. This information is key to transitioning from awareness to action by developing and implementing institutional and systemic policy changes that promote inclusivity and mental health equity for all students.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Traditionally, undergraduate college years represent a critical developmental period in the human lifespan. This period often coincides with emerging adulthood (ages 18-25 years), which is marked by greater personal exploration of racial/ethnic, sexual, and gender identities (Arnett, 2014). Coupled with navigating the academic and social pressures that are often associated with the college experience (American College Health Association [ACHA], 2025), undergraduate students are inundated with a variety of stressors that can cause psychological distress. Over time, psychological distress can lead to negative mental health outcomes such as anxiety, depression, suicidal ideation, and suicide (Zhu et al., 2022). These negative mental health outcomes are highly prevalent among college students and research indicates that their prevalence is increasing. For example, recent data from the Healthy Minds Study (Eisenberg et al., 2023), a national web-based survey of college students' mental health, revealed that 44% of respondents screened positive for moderate to severe depression, 37% screened positive for generalized anxiety disorder, and 15% reported suicidal ideation within the past year, which were the highest rates in the survey's 15-year history.

Mental health problems during college years are associated with decreased energy levels and concentration difficulties, which hinder students' academic performance, leading to lower grade point averages and reduced retention (Bruffaerts et al., 2018; De Luca et al., 2016). These disruptions in academic performance may have additional long-

term consequences such as limited employment opportunities and earning potentials (Bonnie et al., 2015).

While all undergraduate students are vulnerable to experiencing psychological distress and developing negative mental health outcomes, researchers have identified notable disparities between certain populations. For example, sexual and gender minority (SGM) college students, including but not limited to those who identify as lesbian, gay, bisexual, and/or transgender/gender nonconforming, have a higher prevalence of negative mental health outcomes like anxiety, depression, and suicidal ideation compared to their heterosexual, cisgender peers (Lipson et al., 2019; Liu et al., 2019; Samek et al., 2024). According to minority stress theory (Meyer, 2003), this is because SGM individuals experience additional, unique stressors (e.g., stigma, discrimination) because of their social minority position, which creates a stressful social environment that contributes to the development of negative mental health outcomes. Although these stressors are associated with negative mental health outcomes, not all SGM individuals experience them, nor do all SGM individuals who report experiencing them go on to develop negative mental health outcomes (Meyer, 2003; Moorhead et al., 2024). To that end, minority stress theory proposes risk factors and protective factors at the individual and group levels that influence the development of both negative and positive mental health outcomes (Meyer, 2003). Examples of these factors that have been identified in the literature include problematic substance use (Dyar et al, 2023; Parent et al., 2019), loneliness (Elmer et al., 2025; Kittiteerasack et al., 2022; Mereish et al., 2017), resilience (Meyer, 2015; Xi & Peralta, 2025), and perceived sense of belonging (Chai, 2023; Wilson & Liss, 2022).

While researchers have examined mental health outcomes as well as the factors influencing them in both SGM and non-SGM undergraduate students, there are gaps that this study hopes to address. First, several studies were conducted at single institutions, which oftentimes limit the generalizability of their findings. Also, transgender/gender nonconforming students are sometimes excluded from analysis due to issues with sample size and statistical power, which then precludes meaningful analysis of gender identity as a variable (Liss & Wilson, 2022; Oswalt & Wyatt, 2011). Additionally, many studies, including those that used larger, more representative samples from the Healthy Minds Study and/or National College Health Assessment, have relied on participants' self-report of mental health outcomes rather than utilizing validated instruments designed to identify and assess these outcomes as well as the factors that influenced them. In the absence of confirmed clinical diagnoses, using data from these instruments may be a more robust method of characterizing psychological functioning and risk for developing negative mental health outcomes in undergraduate students.

Therefore, the purpose of this study is twofold. First, to compare the overall mental health of SGM and non-SGM undergraduate students in the U.S. using validated mental health instruments administered through a national survey of college students. And second, to identify factors that predict mental health outcomes among undergraduate students in the U.S. using validated mental health instruments administered through a national survey of college students. Utilizing the most recent national data from the American College Health Association (ACHA), the study's aims and corresponding research questions are as follows:

1. Compare negative and positive mental health outcomes between SGM and non-SGM undergraduate students.
    a. Is there a significant difference in psychological distress between SGM and non-SGM undergraduate students?
    b. Is there a significant difference in suicide risk between SGM and non-SGM undergraduate students?
    c. Is there a significant difference in psychological well-being between SGM and non-SGM undergraduate students?
2. Compare mental health risk factors and protective factors between SGM and non-SGM undergraduate students.
    a. Is there a significant difference in substance use risk between SGM and non-SGM undergraduate students?
    b. Is there a significant difference in loneliness between SGM and non-SGM undergraduate students?
    c. Is there a significant difference in resilience between SGM and non-SGM undergraduate students?
    d. Is there a significant difference in perceived sense of belonging between SGM and non-SGM undergraduate students?
3. Determine the impact of mental health risk factors and protective factors on mental health outcomes in undergraduate students after controlling for SGM status.

a. To what extent do substance use risk, loneliness, resilience, and perceived sense of belonging predict psychological distress in undergraduate students after controlling for SGM status?
b. To what extent do substance use risk, loneliness, resilience, and perceived sense of belonging predict suicide risk in undergraduate students after controlling for SGM status?
c. To what extent do substance use risk, loneliness, resilience, and perceived sense of belonging predict psychological well-being in undergraduate students after controlling for SGM status?

4. Determine the impact of sexual orientation, gender identity, presence of life stressors, and mental health risk and protective factors on mental health outcomes in undergraduate students.
    a. To what extent do sexual orientation, gender identity, presence of life stressors, substance use risk, loneliness, resilience, and perceived sense of belonging predict psychological distress in undergraduate students?
    b. To what extent do sexual orientation, gender identity, presence of life stressors, substance use risk, loneliness, resilience, and perceived sense of belonging predict suicide risk in undergraduate students?
    c. To what extent do sexual orientation, gender identity, presence of life stressors, substance use risk, loneliness, resilience, and perceived sense of belonging predict psychological well-being in undergraduate students?

Theoretical Framework

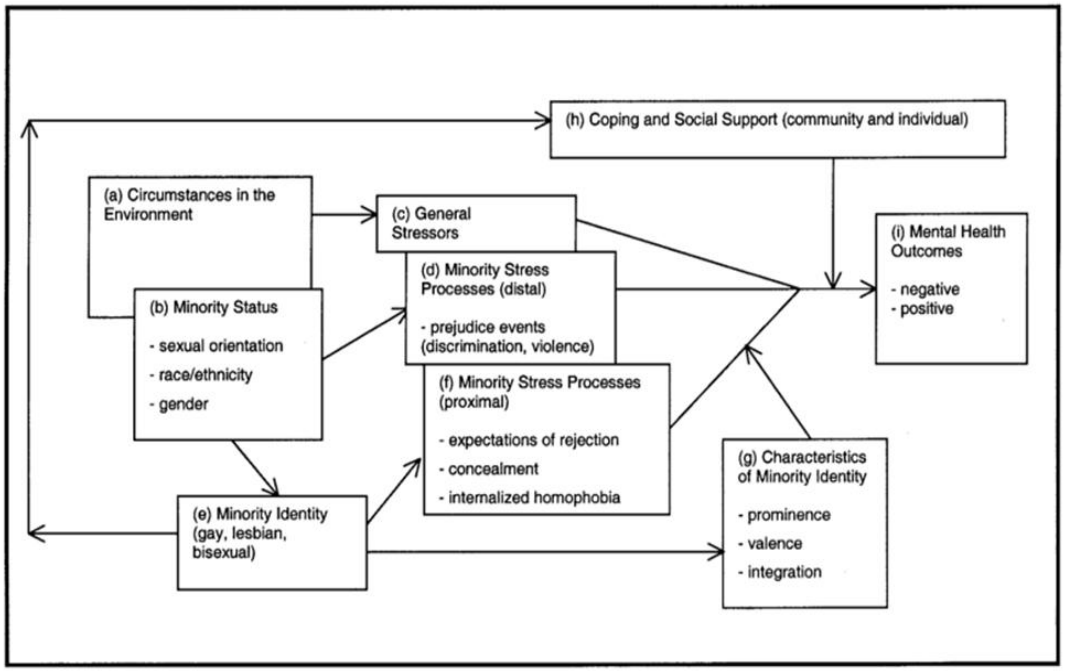
Based on the foundational work of social scientist Dr. Virginia Brooks, Ilan Meyer's minority stress theory offers a framework for understanding the excess prevalence of negative mental health outcomes in sexual minority (e.g. lesbian, gay, bisexual) individuals (Meyer, 2003). The theory is an elaboration of social stress theory, which argues that conditions in the social environment are sources of stress that may lead to physical and mental health issues (Pearlin, 1989). Minority stress theory posits that the stigma, prejudice, and discrimination often experienced by sexual minority individuals, as a result of their social minority position, creates a stressful social environment that leads to negative mental health outcomes (Meyer, 2003). This *minority stress* occurs on top of general stressors that are experienced by all people and therefore requires an adaptation effort above that of those who are not stigmatized (Meyer, 2003).

The minority stress model (Figure 1) depicts stress and coping and their impact on mental health outcomes (box i). Minority stress occurs within general environmental circumstances (box a), an important aspect of which is the person's minority status (box b). Circumstances in the environment lead to exposure to stressors, including general stressors such as job loss or death of a loved one (box c) and minority stressors unique to minority group members (boxes d and f). In articulating his model, Meyer suggests three processes of minority stress that are relevant to sexual minority individuals (Meyer, 1995). There are: (1) external, objective stressful events and conditions, both acute and chronic; (2) expectations of such events and the vigilance that this expectation requires, and; (3) the internalization of negative social attitudes. These processes are typically described along a continuum from distal to proximal. Distal minority stress processes

include events and conditions resulting from the individual's minority status, such as discrimination in employment (box d). Proximal minority stress processes occur as a result of the individual's personal identification with their minority status (box e). Common examples include expectations of rejection, identity concealment, and internalized homophobia (box f) (Meyer, 2003).

Figure 1

Minority Stress Processes in Lesbian, Gay, and Bisexual Populations.



Notably, minority identity is not only a source of stress, but also an important modifier in the stress process. Characteristics of minority identity can either strengthen or weaken the impact of stress (box g). Minority identity can also be a source of resilience when associated with opportunities for affiliation, coping, and social support (box h) that can relieve the impact of stress.

An extension of the minority stress model, the gender minority stress model (Hendricks & Testa, 2012), applies the basic tenets of minority stress to gender minority (e.g. transgender/gender nonconforming) individuals. In this model, minority stress processes stem from adverse experiences related to gender identity and expression rather than sexual orientation.

Both the minority stress model and gender minority stress model have been widely used in studies examining mental health outcomes in SGM populations (Lipson et al., 2019; Parchem et al., 2024; Samek et al., 2024). This study addresses the following elements of the minority stress model: minority status (sexual orientation, gender identity, SGM status), general and distal minority stress processes (life stressors), coping and social support (substance use risk, loneliness, resilience, and perceived sense of belonging), and mental health outcomes (psychological distress, suicide risk, and psychological well-being).

CHAPTER TWO

LITERATURE REVIEW

Sexual Orientation

According to the Human Rights Campaign (Human Rights Campaign (HRC), 2023, para. 1), sexual orientation is "an inherent or immutable enduring emotional, romantic, or sexual attraction to other people." This attraction can be to members of the same sex (e.g., homosexual, lesbian, gay), opposite sex (e.g., heterosexual, straight), or both sexes (e.g., bisexual). Sexual orientation also refers to an individual's personal identity based on those attractions, their related behaviors, and their membership in a community of individuals who share those attractions (American Psychological Association [APA], 2008). While often discussed in terms of three categories (homosexual, heterosexual, and bisexual), sexual orientation occurs along a continuum (APA, 2008). Additionally, although the terms *lesbian*, *gay*, and *bisexual* are commonly used, some individuals may choose to use different labels or no labels to describe sexual orientation. Understandings of sexual orientation are constantly evolving, which creates both challenges and unique opportunities for researchers in this dynamic field.

Gender Identity

Gender identity refers to an individual's innermost concept of self as male, female, a blend of both male and female, or neither male nor female (HRC, 2023). Gender identity can be the same as an individual's sex assigned at birth (e.g., cisgender), or different (e.g., transgender). Gender expression is the external appearance of one's gender identity, which is usually expressed through behaviors, clothing, and body

characteristics that may or may not conform to socially defined norms typically associated with either masculinity or femininity (HRC, 2023).

Like sexual orientation, gender identity occurs along a continuum and there are many terms beyond *cisgender* and *transgender* that individuals choose to describe themselves or others, such as *non-binary*, *agender*, *genderqueer*, or *gender-fluid* (HRC, 2023). However, it is imperative to note that sexual orientation and gender identity are distinct and independent concepts. This fact is sometimes blurred in research when SGM populations are grouped together, a common occurrence that is often necessary, particularly in quantitative studies, to ensure adequate sample sizes (Veldhuis et al., 2024). Understandings of gender identity, like sexual orientation, are dynamic and therefore require careful considerations when conducting research with these marginalized groups.

Life Stressors

Stress is often considered an inevitable part of life. Types of stressors vary based on the individual and their stage of development. Common life stressors in emerging adults ages 18 to 25 years involve transitions in living arrangements, relationships, education, and employment (Arnett, 2014). While stress can be positive and motivating, too much stress can have detrimental effects on several aspects of health, including physical, mental, and emotional (Matud et al., 2020).

Life Stressors in College Students

Students navigate a variety of new experiences and relationships during their college years. Oftentimes, this period coincides with emerging adulthood (ages 18-25 years) and is also marked by greater personal exploration of racial/ethnic, sexual, and

gender identities. These experiences can cause stress which, in turn, may impact mental health outcomes during college. In their secondary analysis of data from the National College Health Assessment (NCHA) Spring 2015, Liu et al. (2019) found that stress exposure was strongly associated with a greater likelihood of anxiety, depression, and suicide attempts, even among students reporting only one or two life stressors. Students who reported at least six life stressors had rates of mental health diagnoses that were up to sixteen-times higher than students who reported no life stressors (Liu et al., 2019).

SGM College Students and Life Stressors

SGM individuals are at risk of experiencing additional stressors related to their minority status, such as stigma, discrimination, and violence. Research indicates that SGM students experience higher rates of microaggressions, discrimination in academic and social spaces, and internalized stigma that undermines belonging and self-esteem (Campbell-Montalvo et al., 2022). SGM college students also report disproportionately high rates of emotional, physical, and sexual assault (Borgogna et al., 2023). This added stress burden arguably puts them at greater risk of negative mental health outcomes, as posited by minority stress theory (Meyer, 2003). In their secondary data analysis of NCHA Fall 2009, Oswalt and Wyatt (2011) found that sexual minority college students, particularly bisexual students, reported more life stressors than heterosexual students. In terms of discrimination, almost half of the sexual minority students reported experiencing discrimination, whereas less than five percent of the heterosexual students reported experiencing discrimination. Notably, however, the basis for the discrimination was not specified in the study. The sexual minority students also had higher rates of diagnosis and treatment of anxiety, depression, and panic attacks than heterosexual students, and more

sexual minority students reported disruption to their academic performance because of these issues than heterosexual students (Oswalt & Wyatt, 2011). Utilizing a more recent NCHA data set, Messman and Leslie (2019) reported similar trends in rates of life stressors, mental health outcomes, and academic performance for gender minority students. These findings were supported by additional studies of gender minority college students (Pascale & DeVita, 2024; Su et al., 2016).

Mental Health Risk Factors

There are many factors that can influence an individual's mental health outcomes. These factors occur at both individual and group levels and exist in multiple contexts, such as relationships, communities, and societies (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024). Risk factors are associated with a higher likelihood of developing negative mental health outcomes, whereas protective factors are associated with reduced negative mental health outcomes and may reduce a risk factor's impact (SAMHSA, 2024).

Substance Use

Substance use is a well-known risk factor for negative mental health outcomes such as anxiety, depression, and psychosis (National Institutes on Drug Abuse [NIDA], 2024). Both substance use disorders and mental health disorders are associated with similar environmental influences, including chronic stress, trauma, and adverse childhood experiences (NIDA, 2024). Negative mental health outcomes can be brought on or exacerbated by substance use, which alters brain chemistry and can lead to increased impulsivity and mood deterioration (NIDA, 2024). In addition, mental health problems can lead individuals to misuse substances in attempt to self-medicate (NIDA, 2024),

which creates a cycle of co-occurring disorders (i.e., substance use disorder and mental health disorder).

Substance Use in College Students. Substance use has become one of the most widespread health problems on college campuses in the United States in recent decades (Welsh et al., 2019). Campuses across the nation have seen increases in cannabis, stimulant, and illicit drug use among students (Welsh et al., 2019). According to a recent systematic review and meta-analysis, students who regularly use substances are more likely to have lower GPAs, spend fewer hours studying, miss more class time, and fail to graduate or be unemployed after graduation (Bulfone et al., 2025). They are also more likely to report negative mental health outcomes like anxiety, depression, self-injurious behavior, and suicidal ideation (Mason, 2023).

College students are particularly vulnerable to problematic substance use. Compared to non-student peers of similar ages, college students are more likely to meet criteria for alcohol or cannabis use disorders and to have more severe substance use disorders (Pasman et al., 2024). A significant challenge with tackling substance use on college campuses, especially alcohol and cannabis, is its integration into the norms of the "college experience" (e.g., parties, Greek life) (Welsh et al., 2019). Coupled with the unique academic and social pressures associated with college life, college students are at increased risk of developing substance use disorders and subsequent negative mental health outcomes (Welsh et al., 2019).

SGM College Students and Substance Use. Research has indicated that SGM adolescents and emerging adults have higher rates of substance use than their heterosexual, cisgender peers (Goldbach et al., 2014; Parent et al., 2019). While fewer in

number, studies of substance use in SGM college students have identified similar trends (Dyar, 2022; LeCroy et al., 2024). For example, in their survey of nearly 200 undergraduate students, LeCroy and colleagues (2024) reported higher use of cannabis, alcohol, illicit drugs, and prescription drugs among SGM students compared to non-SGM students. However, cannabis was the only substance with a statistically significant difference in usage between the populations (LeCroy et al., 2024). These results are consistent with a prior study by Dyar (2022) that also found higher rates of cannabis use in SGM students compared to heterosexual students.

Loneliness

Loneliness is defined as the distressing feeling that accompanies the perception that one's social needs are not being met by the quantity or quality of one's social relationships (Perlman & Peplau, 1981). According to a recent Healthy Minds monthly poll from the American Psychiatric Association (APA, 2024), 30% of U.S. adults reported feeling lonely at least once a week over the last year, while 10% reported feeling lonely every day. Younger adults, particularly those aged 18-34, are more likely to feel lonely, with 30% reporting loneliness several times a week or even daily (APA, 2024).

While feelings of loneliness can provide motivation to seek social connection, sometimes loneliness becomes a chronic state (Hawkley & Cacioppo, 2015). Left unchecked, loneliness can have serious physical, mental, emotional, and behavioral health consequences (Hawkley & Cacioppo, 2015). Examples include increased cardiovascular health risk (Caspi et al., 2006), depressive symptoms (Cacioppo et al., 2006), impaired cognitive performance (Gow et al., 2007), and suicide (Shoib et al., 2023).

Loneliness in College Students. Although loneliness can be experienced by all age groups, college students are especially vulnerable (Active Minds, 2024; Zahedi et al., 2022). The transition from high school to college is a pivotal moment in emerging adulthood that brings changes in roles, routines, and relationships (Zahedi et al., 2022). While these changes provide new opportunities, they can also cause students to feel lonely in their new environment. For example, in their sample of 1,089 college students, the Active Minds organization (2024) found nearly two-thirds of students reported feeling lonely. They also found that students who reported feeling lonely were over four times more likely to experience severe psychological distress (Active Minds, 2024).

SGM College Students and Loneliness. SGM college students report higher rates of loneliness than their heterosexual, cisgender peers (Active Minds, 2024; Charmaraman et al., 2024; Flesaker et al., 2025). In an analysis of data from the 2021-2022 Healthy Minds Study, the prevalence of loneliness in the sample was 58%, and loneliness was even more prevalent (79%) in gender minority students (Flesaker et al., 2025). Similarly, the Active Minds (2024) survey reported loneliness in over 70% of SGM students, compared to just over 60% in non-SGM students. While these studies did not formally investigate potential reasons for the disparities in loneliness, higher exposure to stressors such as discrimination, peer rejection, and both in-person and online harassment were cited as possible explanations (Charmaraman et al., 2024). Indeed, elevated rates of bullying and cyberbullying among SGM youth have been reported in the literature (Abreu & Kenny, 2017; Henderson et al., 2022), which may contribute to the observed disparities in loneliness.

Mental Health Protective Factors

Resilience

Resilience is an individual's capacity to successfully adapt to stressful or traumatic events (Southwick et al., 2014). It is influenced by many factors, including personal characteristics, environmental circumstances, and cultural background (Southwick et al., 2014). Resilience is positively associated with experiencing positive emotions and using adaptive coping strategies, which protect against stress and promote overall well-being (Xu & Yang, 2023). Because resilience is a skill set that can be learned and practiced throughout the lifespan, it is a prime target for interventions aiming to improve mental health outcomes (Southwick et al., 2014).

Resilience in College Students. Despite the irrefutable benefits of resilience in students' pursuit of higher education, over one-third of college students worldwide have low resilience (Chua et al., 2022). Students with lower resilience report higher levels of stress, which is associated with higher dropout rates and worsened academic performance (Chua et al., 2022). A recent survey of 1,680 college students found that psychological resilience mediates the relationship between learning stressors and learning burnout (Gong et al., 2023).

SGM College Students and Resilience. A growing body of research suggests that SGM college students exhibit lower resilience than their non-SGM peers (Peyer et al., 2023; Xi & Peralta, 2025). For example, Peyer and colleagues' secondary analysis of Spring 2021 NCHA data found higher levels of stress and lower levels of resilience among cisgender female and SGM students compared to cisgender male and heterosexual students (2023). Similarly, Xi and Peralta (2025) surveyed over 500 undergraduate

students from a Midwestern U.S. university and found lower levels of resilience among sexual minority students compared to heterosexual students.

Notably, however, there is evidence that SGM college students display some resilience factors at higher levels than their non-SGM counterparts. In their secondary data analysis of NCHA Spring 2021, Chang and colleagues (2024) found that sexual minority students had significantly greater help-seeking willingness (e.g., openness to seeking professional mental health help when needed) compared to heterosexual students, even after controlling for help-seeking history. Identifying these factors and behaviors that promote resilience, especially in SGM students, is crucial to improving their mental health outcomes.

Perceived Sense of Belonging

Perceived sense of belonging (PSOB) can be defined as "a sense of personal involvement in a social system so that persons feel themselves to be an indispensable and integral part of the system" (Anant, 1966, p. 21, as cited in Hagerty et al., 1992). Developmental psychologist Abraham Maslow identified belonging as a basic human need, placing it third in his hierarchy of needs, just after physiological and safety needs (Maslow, 1954). While there is widespread agreement that belonging is a fundamental human need, there is less consensus on how to define or measure it, or how individuals experience and fulfill this need (Allen et al., 2021). As a result, various definitions and scales have been developed to identify and capture this essential construct. Despite these differences, key components of PSOB include feeling "valued," "accepted," and "connected" to the environment (Allen et al., 2021).

Many individuals struggle to feel PSOB despite its importance. Social isolation, loneliness, and lack of connection to others are commonly reported and can severely impact one's PSOB (Allen et al, 2021). These feelings of loneliness and lack of PSOB are especially prevalent in minority groups that have been historically marginalized from mainstream society (Allen et al, 2021).

PSOB is crucial in that it affects numerous physical, mental, social, and behavioral outcomes. Higher PSOB is positively associated with better self-reported physical and mental health across the adult lifespan (Clark et al., 2024; Michalski et al., 2020). In contrast, a lack of PSOB is associated with increased risk of physical and mental health issues, such as anxiety, depression, antisocial behavior, cognitive decline, cardiovascular disease, and sleep disturbances (Hawkley & Capitanio, 2015; Holt-Lunstad, 2018).

PSOB in College Students. The concept of PSOB within the college community has been defined in various ways. According to Strayhorn (2018), core features of PSOB in the college setting include students' perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group. Like other forms of belonging, college PSOB influences various aspects of life. For example, college PSOB is positively associated with academic self-efficacy (Wurster et al., 2021) as well as health-promoting behaviors and better physical health (Hale et al., 2005; Walton & Cohen, 2011). In a longitudinal randomized controlled trial, Walton and Cohen (2011) found that freshman-year college students who received a brief social belonging intervention had higher grade point averages than those who did not. Additionally, the

intervention group reported better health and well-being and fewer doctor visits three years post-intervention compared to the control group (Walton & Cohen, 2011). Similarly, a secondary analysis of national data from the Beginning Postsecondary Students Longitudinal Study revealed that PSOB was positively associated with academic persistence, use of campus services, and self-reported mental health at four-year institutions (Gopalan & Brady, 2019). As such, college PSOB is crucial to both academic success as well as physiological and psychological well-being.

SGM College Students and PSOB. Research has demonstrated that SGM college students often experience low PSOB (Garvey et al., 2017; Goldberg et al., 2019; Parr, 2022). For example, in a secondary analysis of data from the 2017-2018 Healthy Minds Study, Parr (2022) found that SGM undergraduate and graduate students reported significantly lower PSOB than non-SGM students at several age points. Diminished PSOB in SGM college students is influenced by heteronormative and cisnormative classroom and campus environments (Garvey et al., 2017; Goldberg et al., 2019), lack of SGM-specific training for faculty and staff (Garvey et al., 2015), and lack of SGM-specific programming and services available on campus (Nguyen et al, 2018). Non-affirming and non-inclusive environments lead to feelings of fear, invisibility, and lack of validation that, in turn, contribute to mental health challenges and poor academic performance for SGM college students (Goldberg et al., 2019).

Studies have also found significant differences in PSOB and mental health outcomes between SGM and non-SGM college students. Pagliaccio's analysis of Healthy Minds Study data from 2007-2022 revealed that SGM students were over three times more likely to report depression than non-SGM students, and that lack of PSOB was a

major driving force behind this disparity (Pagliaccio, 2024). Similarly, in Parr's study, the association between PSOB and socioemotional flourishing was significantly greater for SGM students than for non-SGM students across all ages, suggesting that PSOB may play a greater role in psychological well-being for SGM students than for non-SGM students (Parr, 2022).

Notably, there have also been reported differences in PSOB within the SGM community. In their analysis of mental health and general psychological processes among sexual minority college students, Liss and Wilson (2022) found that bisexual students scored significantly higher on depression and significantly lower on PSOB than other sexual minority groups. However, they were unable to include transgender identity as a variable in their analyses, and their assessment tool was somewhat new, with few external studies having examined its validity.

Psychological Distress, Psychological Well-Being, and Mental Health Outcomes

Both psychological distress (PD) and psychological well-being (PWB) are dimensions of psychological functioning that relate to mental health outcomes. PD is a state of mental and emotional suffering characterized by mental, and sometimes physical, symptoms of anxiety and depression (APA, 2018). These can include feeling sad, hopeless, or worthless, and changes in appetite, sleep, or socialization patterns. While often transient in nature, PD can sometimes indicate the beginning of more chronic mental health issues such as generalized anxiety disorder or major depressive disorder (APA, 2018). As such, many self-report measures of PD are used as screening tools for mental health issues (APA, 2018).

In contrast, according to psychologist Ed Diener (2000), a renowned scholar in the positive psychology movement, PWB consists of an individual's cognitive and affective appraisals of their life. Cognitive appraisal refers to overall life satisfaction as well as satisfaction within specific domains of life, such as school, family, and career (Diener, 2000). Affective appraisal involves emotional experiences. An individual with high PWB frequently experiences positive emotions such as joy, hope, and pride, and infrequently experiences negative emotions such as anger, jealousy, and disappointment (Diener, 2000).

Both PD and PWB are critical to mental health outcomes. Broadly speaking, one's mental health can be thought of as the combination of positive and negative psychological symptoms. However, just as health is not merely the absence of illness or disease (World Health Organization, 1946), a lack of positive or negative psychological symptoms alone does not constitute "poor" or "good" mental health, respectively. Rather, the concept of mental health is dynamic and thus requires a more comprehensive and holistic understanding. Still, the majority of research on negative mental health focuses on outcomes such as depression, anxiety, and suicidality, since they are major contributors to morbidity and mortality throughout the United States (World Health Organization, 2022).

PD, PWB, and Mental Health Outcomes in College Students

While pursuing higher education fosters emotional and intellectual growth, it also presents a potentially stressful and challenging experience for many college students that can negatively impact students' physical and mental health (Liu et al., 2019). Consequently, many undergraduate students experience PD and the onset or exacerbation

of negative mental health outcomes during this time (Liu et al., 2019). The academic stressors associated with higher education put undergraduate students at heightened risk for negative mental health outcomes. In their secondary analysis of data from the 2011-2018 NCHA II and the 2007-2018 Healthy Minds Study, Duffy and colleagues (2019) found that rates of anxiety, depression, non-suicidal self-injury, suicidal ideation, and suicide attempts increased significantly over the years assessed, with some rates doubling within a five-year period. Another analysis of 2013-2021 Healthy Minds Study data showed comparable increases in rates of mental health issues across racial and ethnic groups of college students (Lipson et al., 2022).

SGM College Students and Mental Health

Research has indicated that sexual minority adults are more likely than non-minority adults to experience mental health issues including major depression, substance use, and suicidal thoughts (Gmelin et al., 2022; Substance Abuse and Mental Health Services Administration, 2024). In addition, The Trevor Project's National Survey on LGBTQ Youth Mental Health (2022) found that transgender young adults ages 18-24 were significantly more likely to both consider and attempt suicide within the last year compared to their cisgender peers.

These trends are similar for SGM college students. In their analysis of data from the 2015-2017 Healthy Minds Study, Lipson and colleagues (2019) found that gender minority students had a significantly higher prevalence of mental health problems than cisgender students. Also, gender minority status was associated with 4.3 times higher odds of meeting criteria for one or more mental health problems (Lipson et al., 2019). Utilizing more recent data from the 2016-2019 NCHA II, Samek and colleagues (2024)

examined trends in diagnosis and treatment of anxiety, depression, and suicidal ideation in SGM college students. They reported statistically significant increases in the prevalence of each mental health indicator for sexual minority students compared to their heterosexual peers. They also found that students who identified as both a sexual and gender minority were more likely to report each mental health indicator more often when compared to students who identified as heterosexual and non-binary (Samek et al., 2024).

Fewer studies have examined PD and PWB in SGM college students compared to negative mental health outcomes. Russell and colleagues (2024) sought to identify demographic and psychosocial factors that predicted severe PD in undergraduate college students during the COVID-19 pandemic using NCHA III data from Fall 2019 to Spring 2021. They reported that SGM students were at elevated risk for severe PD compared to other demographic groups. However, they also found that SGM students utilized mental health services more frequently than non-SGM students, suggesting that, despite typically being at greater risk for negative mental health outcomes, SGM students may be more open and willing to seek help than other demographic groups (Russell et al., 2024). Similarly, Ostermiller et al. (2024) utilized NCHA Fall 2019 data to examine disparities in health-related lifestyle factors and PD among SGM graduate students and found that SGM graduate students reported less healthy lifestyles and greater PD than their non-SGM peers.

Summary of the Literature

In summary, the prevalence of self-reported negative mental health outcomes in college students is on the rise, which poses a critical public health concern. College students continue to experience life stressors pertaining to academics as well as the

transition to adulthood, which can negatively impact their mental health. SGM college students are more vulnerable to life stressors as a result of their stigmatized social status, which helps explain why many of these negative mental health outcomes are even more prevalent among SGM college students. However, more research utilizing large-scale, representative data sets, is needed to better identify factors that contribute to negative mental health outcomes in SGM college students. Additionally, there is a paucity of research examining protective factors that promote psychological well-being in SGM college students. Therefore, the purpose of this study is to compare the overall mental health of SGM and non-SGM undergraduate students in the United States using validated mental health instruments administered through a national survey of college students, as well as to identify factors that predict mental health outcomes among undergraduate students in the United States using validated mental health instruments administered through a national survey of college students.

CHAPTER THREE

METHODS

This study is a secondary analysis of data collected by the American College Health Association National College Health Assessment (ACHA NCHA). The ACHA NCHA is a cross-sectional web-based survey administered biannually and voluntarily by postsecondary institutions to undergraduate and graduate students across the United States on core topics such as physical health, mental health, substance use, and sexual health (ACHA, 2025). There are several externally developed, validated scales embedded within the ACHA NCHA pertaining to these topics. The ACHA NCHA has been revised several times since its initiation in Fall 2000, with the most recent version, ACHA NCHA IIIb, released in Fall 2023. Results from ACHA NCHA III cannot be compared to prior versions of the survey due to major revisions, according to the ACHA. For this reason, this study utilizes data only from the ACHA NCHA III as granted by the ACHA.

Population

This study includes full-time undergraduate students between ages 18-24 enrolled at four-year institutions in the United States as the population of interest. This age range aligns with data from the National Center for Education Statistics (2023), which reported 91% of undergraduate students enrolled full-time were under age 25 in Fall 2021. Participants with missing data pertaining to any of the study variables (Table 1) were excluded from analysis.

Study Variables

The variables of interest are summarized in Table 1. Demographic characteristics such as age, race/ethnicity, year in school, and enrollment status were also included to describe the sample.

Table 1

Summary of Study Variables

Study Variable	Variable Type	Level of Measurement
Sexual Orientation	Independent	Categorical
Gender Identity	Independent	Categorical
SGM Status	Independent	Categorical
Life Stressors	Independent	Continuous
Substance Use Risk	Independent	Continuous
Loneliness	Independent	Continuous
Resilience	Independent	Continuous
Perceived Sense of Belonging	Independent	Continuous
Psychological Distress	Dependent	Continuous
Suicide Risk	Dependent	Continuous
Psychological Well-Being	Dependent	Continuous

Sexual Orientation

Students were asked to select a term that best describes their sexual orientation. The choices were: straight/heterosexual, bisexual, gay, lesbian, pansexual, queer, questioning, and other (free text response). The *sexual orientation* variable was

dichotomized as *heterosexual* (straight) or *non-heterosexual* (bisexual, gay, lesbian, pansexual, queer, questioning, other) for analysis.

Gender Identity

Students were asked to select a term that they use to describe their gender identity. The choices were: woman/female, man/male, trans woman, trans man, genderqueer, agender, gender fluid, intersex, non-binary, and other (free text response). The *gender identity* variable was dichotomized as *cisgender* (female, male) or *transgender/gender non-conforming (TGNC)* (trans woman, trans man, genderqueer, agender, gender fluid, intersex, non-binary, other) for analysis.

SGM Status

Students were sorted into one of two groups (*SGM* or *non-SGM*) based on their responses to survey items pertaining to sexual orientation and gender identity. Students must identify as both heterosexual and cisgender to be included in the non-SGM group. Students who identify in any way other than heterosexual or cisgender were included in the SGM group. The *SGM status* variable was dichotomized as *SGM* or *non-SGM* for analysis.

Life Stressors

Students were asked if they had problems or challenges with various life stressors within the last 12 months. They could respond “yes” or “no” to each of the 18 life stressors. Examples of life stressors were academics, finances, family, bullying, and discrimination. For analysis purposes, a *life stressors* variable was created that sums the total number of stressors with a “yes” response for each participant. Scores will range from 0 to 18 and this variable was treated as continuous.

Substance Use Risk

In the NCHA-III, substance use risk is measured by the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). Developed by the WHO (2010), the ASSIST is used in a variety of settings to screen for use of 10 types of substances. It is an 8-item questionnaire with weighted scoring that determines a risk level of "low", "moderate", or "high" for each substance reported. Substance-specific scores range from 0 to 39, except tobacco (0-31). The ASSIST has demonstrated strong internal consistency in adults ages 18 years and older, with reported Cronbach's alpha values ranging from 0.68 to 0.88, as well as good test-retest reliability (Gryczynski et al., 2015). Because this study is primarily interested in overall substance use risk, a total substance involvement (TSI) score was calculated by summing the substance-specific scores for each participant. The TSI score was used in analyses involving substance use risk, with higher scores reflecting higher risk level. TSI scoring was used in the initial validation of the ASSIST (Humeniuk et al., 2008), and was recently used in examining substance use risk and mental health disorders (Adlard et al., 2023). The *substance use risk* variable was treated as continuous for analysis.

Loneliness

In the NCHA-III, loneliness is measured using the UCLA Three-Item Loneliness Scale (Hughes et al., 2004). Each item measures a dimension of loneliness: relational connectedness, social connectedness, and self-perceived isolation. Responses are scored as "hardly ever (1)," "some of the time (2)," or "often (3)," for a total score range of 3 to 9. Higher scores reflect more loneliness, and a score of 6 or greater is considered positive for loneliness (Hughes et al., 2004). The three-item scale shows acceptable internal

consistency, with reported Cronbach's alpha values ranging from 0.72 to 0.80 (Hughes et al., 2004). The *loneliness* variable was treated as continuous for analysis.

Resilience

The NCHA-III measures resilience via the Connor-Davidson Resilience Scale (CD-RISC2) (Vaishnavi et al., 2007). The scale's two items come from the original CD-RISC and ask respondents how much they agree with the statements as they apply to them over the last month. Each item is scored on a 4-point Likert scale ranging from "not at all true (0)" to "true nearly all the time (4)" for a possible score range of 0 to 8, with higher scores reflecting greater resilience (Vaishnavi et al., 2007). The two-item scale shows adequate convergent validity and test-retest reliability, reported Cronbach's alpha values near 0.80 (Wojujutari et al., 2024). The *resilience* variable was treated as continuous for analysis.

Perceived Sense of Belonging

Students were asked whether they felt that they belong at their college/university. Responses were on a 6-point Likert scale ranging from "strongly disagree (1)" to "strongly agree (6)". For analysis purposes, the *perceived sense of belonging (PSOB)* variable was treated as continuous.

Psychological Distress

Students' PD was assessed using the Kessler Psychological Distress Scale (K6) (Kessler et al., 2002). The K6 is a six-item assessment tool that measures non-specific PD. It asks respondents about how they have been feeling within the past 30 days, with each item assessing how often they have felt a certain way over that time period. Each item is scored on a 5-point Likert scale ranging from "none of the time (0)" to "all of the

time (4)". The K6 screens for severe mental illness, defined as a total score of 13 or higher (Kessler et al., 2002). The K6 was initially developed for the US National Health Interview Survey using methods of Item Response Theory. It was reported to have excellent internal consistency reliability with a Cronbach's alpha of 0.89 (Kessler et al., 2002). Its brevity, strong psychometric properties, and ability to identify cases of severe mental illness make it an attractive choice for use in general health surveys.

The *PD* variable was treated as continuous data for analysis.

Suicide Risk

The NCHA-III measures suicide risk via the Suicide Behaviors Questionnaire-Revised (SBQ-R) (Osman et al., 2001). The SBQ-R has four items, each pertaining to a different dimension of suicidality (e.g., ideation, attempt). Each item is scored on a Likert scale with total scores ranging from 3 to 18. Higher scores indicate higher suicide risk, with a score of 7 or higher considered a positive screening (Osman et al., 2001). The SBQ-R shows acceptable internal consistency, with a reported Cronbach's alpha value of 0.80 in university students (Aloba et al., 2017). The *suicide risk* variable was treated as continuous for analysis.

Psychological Well-Being

Students' PWB was assessed using the Diener Flourishing Scale (Diener et al., 2010). Each of the eight items is answered on a 7-point Likert scale ranging from "strongly disagree (1)" to "strongly agree (7)". The items ask about respondents' self-perceived success in important psychosocial and psychological domains of life such as self-esteem, purpose, relationships, and optimism. Total scores range from 8 to 56, with

higher scores indicating better overall psychological functioning and the presence of psychological resources and strengths (Diener et al., 2010).

The Flourishing Scale demonstrated high internal consistency reliability with a Cronbach's alpha of 0.87 in its initial testing among college students (Diener et al., 2010). The scale also showed high convergence with similar scales such as the UCLA Loneliness Scale and the Satisfaction with Life Scale, demonstrating adequate construct validity (Diener et al., 2010). Thus, the Flourishing Scale provides a satisfactory assessment of respondents' overall self-reported PWB.

The *PWB* variable was treated as continuous data for analysis.

Analysis

Data analysis was conducted using SPSS 31.0 statistical software program (IBM, Armonk, NY). Descriptive statistics were calculated for all demographic variables, including frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Data was evaluated for missingness, and each study variable had no more than 6% of cases missing data. Therefore, missing cases were excluded pairwise from analyses as there was not an overwhelming amount of missing data.

Independent samples *t*-tests were used to compare SGM students and non-SGM students on negative mental health outcomes (i.e., psychological distress and suicide risk) and positive mental health outcomes (i.e., psychological well-being) as well as mental health risk factors (i.e., substance use risk and loneliness) and protective factors (i.e., resilience and perceived sense of belonging). Hierarchical linear regression analysis was used to determine the extent to which the mental health risk factors and protective factors

predict mental health outcomes in undergraduate students after controlling for SGM status. Lastly, multiple regression analysis was used to determine the extent to which sexual orientation, gender identity, life stressors, and the mental health risk factors and protective factors predict mental health outcomes in undergraduate students.

Study Approval

This secondary data analysis was granted exemption status by the institutional review board (IRB) at Oakland University (IRB-FY2026-233).

CHAPTER FOUR

RESULTS

A total of 256,454 eligible students participated in the NCHA III from Fall 2019 to Spring 2023. Table 2.1 summarizes the sample demographics for this study. The mean age ± standard deviation was 19.95 ± 1.45 years. Most participants identified as straight (72.88%). Participants were most likely to identify as female (65.53%), followed by male (28.70%) and non-binary (5.15%). Participants predominantly identified as White (67.38%), followed by Asian/Asian American (15.23%) and Hispanic/Latino/a/x (14.89%). Most participants reported not being in a relationship (59.18%) and living on campus/university housing (47.85%).

Table 2.1

Sample Demographics

Demographic Variable		N	%
Sexual Orientation			
	Asexual	3422	1.33
	Bisexual	32,567	12.70
	Gay	4884	1.90
	Lesbian	5856	2.28
	Pansexual	6077	2.37
	Queer	6510	2.54
	Questioning	8078	3.15
	Straight	186,897	72.88
	Other	1317	.51
	Missing	846	.33
Gender Identity			
	Female	168,048	65.53
	Male	73,611	28.70
	Non-Binary	13,214	5.15
	Missing	6	.00

Table 2.1 – Continued

Sample Demographics

Demographic Variable	N	%
Race/Ethnicity*		
American Indian/Native Alaskan	5297	2.07
Asian/Asian American	39,054	15.23
Black/African American	16,274	6.35
Hispanic/Latino/a/x	38,187	14.89
Middle Eastern/North African/Arab Origin	4225	1.65
Native Hawaiian/Pacific Islander	1589	.62
White	172,808	67.38
Biracial/Multiracial	12,761	4.98
Other	2460	.96
Year in School		
1st year undergraduate	74,238	28.95
2nd year undergraduate	60,826	23.72
3rd year undergraduate	63,618	24.81
4th year undergraduate	49,459	19.29
5th year or more undergraduate	8313	3.24
Relationship Status		
Not in a relationship	151,773	59.18
In a relationship but not married/partnered	100,670	39.25
Married/partnered	3635	1.42
Current Residence		
Campus/university housing	122,712	47.85
Parent/guardian/other family member's home	49,179	19.18
Off-campus/non-university housing	78,124	30.46
Temporarily "couch surfing" until I find housing	621	.24
I don't currently have a place to live	68	.00
Other	751	.29
Missing	4999	1.95
Approximate GPA		
A	148,816	58.03
B	86,178	33.60
C	15,076	5.88
D	1217	.47
F	222	.09
N/A	4276	1.67
Missing	669	.26

Note: *Represents 'select all that apply' survey item where multiple responses were permitted.

Data were checked for the assumptions of parametric statistical techniques (i.e., independent samples *t*-tests and multiple regression) prior to analysis. The dependent variables (i.e., psychological distress, suicide risk, and psychological well-being) were measured using continuous scales. The sampling method of the NCHA III assumed approximate random sampling and independence of observations.

Normality of the dependent variables was assessed by analysis of frequency histograms. Although minor skewness was observed in suicide risk and psychological well-being, transformation of the dependent variables was not performed. Linear and multilevel regression models are generally robust to violations of the normality assumption, particularly in large samples. Using both empirical and simulated data, Schmidt and Finan (2018) demonstrated that linear models remain robust to violations of the normality assumption with sample sizes between approximately 200 and 300 observations. Furthermore, they noted that transforming outcomes variables solely to achieve normality may introduce bias and reduce the interpretability of parameter estimates (Schmidt & Finan, 2018). Consequently, modest departures from normality are unlikely to meaningfully bias parameter estimates. Given these considerations, and to maintain the interpretability of model coefficients, the dependent variables were retained in their original metric.

Linearity was assessed through analysis of residuals scatterplots. The scatterplots displayed a random scatter of points around a horizontal line, indicating linearity. For the independent samples t-tests, homogeneity of variance was checked via Levene's test for equality of variances. Because each test yielded a significant value ($< .05$), *t* values corresponding to "equal variances not assumed" were reported (Pallant, 2020). For the

regression analyses, homoscedasticity was checked via Breusch-Pagan tests. Because each test yielded a significant value ($p < .001$), the assumption of homoscedasticity was violated. However, the presence of heteroscedasticity does not invalidate the analysis of ungrouped data (Tabachnick & Fidell, 2019). As such, the author chose not to transform the dependent variables due to limited interpretability of transformed scores (Tabachnick & Fidell, 2019). Collinearity diagnostics indicated an absence of multicollinearity among all independent variables, as all tolerance values were greater than 0.1 and all variance inflation factor (VIF) values were less than 10 (Tabachnick & Fidell, 2019). Lastly, outliers were examined via Cook's distances. Since all Cook's distance values were less than one, outliers were deemed insignificantly influential and were not removed from analysis (Tabachnick & Fidell, 2019).

Independent samples *t*-tests were used to compare negative mental health outcomes (i.e., psychological distress and suicide risk) and positive mental health outcomes (i.e., psychological well-being) between SGM and non-SGM students. As indicated in Table 2.2, there were statistically significant differences between SGM and non-SGM students for all mental health outcomes. SGM students had higher levels of psychological distress ($M = 11.00$, $SD = 5.30$) than non-SGM students ($M = 7.90$, $SD = 5.15$; $t(123029) = -132.37$, $p < .001$). SGM students also had higher suicide risk ($M = 7.21$, $SD = 3.67$) than non-SGM students ($M = 4.76$, $SD = 2.67$; $t(99622) = -161.37$, $p < .001$). Conversely, SGM students had lower levels of psychological well-being ($M = 41.66$, $SD = 9.07$) than non-SGM students ($M = 45.58$, $SD = 8.18$; $t(116103) = 100.19$, $p < .001$). Effect sizes (Cohen's *d*) were medium (.47) for positive mental health outcomes and large for negative mental health outcomes (-.60 and -.82 for psychological distress

and suicide risk, respectively), based on Cohen's interpretation guidelines (Cohen, 1988, as cited in Pallant, 2020).

Table 2.2

Mental Health Outcomes for SGM and Non-SGM Students

	SGM			Non-SGM				
	N	*M*	*SD*	*N*	*M*	*SD*	*t*	Cohen's *d*
Negative MHO								
Psychological Distress	69,767	11.00	5.30	182,637	7.90	5.15	-132.37*	-.60
Suicide Risk	70,025	7.21	3.67	184,214	4.76	2.67	-161.37*	-.82
Positive MHO								
Psychological Well-Being	70,100	41.66	9.07	183,797	45.58	8.18	100.19*	.47

Note: MHO = mental health outcome; *$p < .001$

Independent samples *t*-tests were also used to compare mental health risk factors (i.e., substance use risk and loneliness) and protective factors (i.e., resilience and perceived sense of belonging) between SGM and non-SGM students. As shown in Table 2.3, there were statistically significant differences between SGM and non-SGM students for all mental health risk factors and protective factors. SGM students had higher levels of substance use risk ($M = 12.96$, $SD = 18.99$) than non-SGM students ($M = 9.20$, $SD = 15.32$; $t(107242) = -47.09$, $p < .001$). SGM students also had higher levels of loneliness ($M = 6.17$, $SD = 1.85$) than non-SGM students ($M = 5.44$, $SD = 1.84$; $t(126706) = -89.05$, $p < .001$). Conversely, SGM students had lower levels of resilience ($M = 5.61$, $SD = 1.59$) than non-SGM students ($M = 6.06$, $SD = 1.51$; $t(121251) = 64.23$, $p < .001$). SGM students also had lower levels of perceived sense of belonging ($M = 4.55$, $SD = 1.10$) than non-SGM students ($M = 4.80$, $SD = 1.06$; $t(122555) = 50.82$, $p < .001$). Effect sizes

(Cohen's *d*) for all risk factors (-.23 for substance use risk and -.40 for loneliness, respectively) and protective factors (.29 for resilience and .23 for perceived sense of belonging, respectively) were small (Cohen, 1988, as cited in Pallant, 2020).

Table 2.3

Mental Health Risk Factors and Protective Factors for SGM and Non-SGM Students

	SGM			Non-SGM				
	N	*M*	*SD*	*N*	*M*	*SD*	*t*	Cohen's *d*
Risk Factors								
Substance Use Risk	70,492	12.96	18.99	185,131	9.20	15.32	-47.09*	-.23
Loneliness	70,319	6.17	1.85	184,503	5.44	1.84	-89.05*	-.40
Protective Factors								
Resilience	70,194	5.61	1.59	184,311	6.06	1.51	64.23*	.29
PSOB	70,267	4.55	1.10	184,305	4.80	1.06	50.82*	.23

Note: PSOB = perceived sense of belonging; *$p < .001$

Hierarchical linear regression analyses were conducted to determine the impact of mental health risk factors (i.e., substance use risk and loneliness) and protective factors (i.e., resilience and PSOB) on mental health outcomes (i.e., psychological distress, suicide risk, and psychological well-being) in undergraduate students after controlling for SGM status. SGM status was entered in Step 1 for each model to control its influence on mental health outcomes and to better isolate the unique effects of the risk factors and protective factors on mental health outcomes.

Results for psychological distress are shown in Table 2.4. SGM status was entered in Step 1, which was significant ($\beta = .26$; $p < .001$) and explained 7% of the variance in psychological distress. After entry of the mental health risk factors and protective factors in Step 2, the total variance explained by the model was 39% [$F(5, 252{,}180) = 32{,}321.34$; $p < .001$]. The mental health risk factors and protective factors explained 32% of the

variance in psychological distress after controlling for SGM status [$F\Delta(4, 252{,}180) = 33{,}522.52$; $p < .001$]. In the final model, all of the independent variables were statistically significant ($p < .001$). Loneliness had the strongest effect (β = .34), followed by resilience (β = -.24), SGM status (β = .14), perceived sense of belonging (β = -.12), and substance use risk (β = .10).

Table 2.4

Hierarchical Linear Regression on Psychological Distress

Variable	*B*	*SE B*	β	*sr*	R^2	ΔR^2
Step 1					.07	.07***
Constant	4.81	.03				
SGM Status	3.10	.02	.26***	.26		
Step 2					.39	.32***
Constant	7.92	.07				
SGM Status	1.64	.02	.14***	.13		
Substance Use Risk	.03	.00	.10***	.10		
Loneliness	1.1	.01	.34***	.35		
Resilience	-.84	.01	-.24***	-.23		
PSOB	-.61	.01	-.12***	-.11		

Note: PSOB = perceived sense of belonging; SGM = sexual and gender minority; ***$p < .001$

Results for suicide risk are shown in Table 2.5. SGM status was entered in Step 1, which was significant (β = .35; $p < .001$) and explained 12% of the variance in suicide risk. After entry of the mental health risk factors and protective factors in Step 2, the total variance explained by the model was 28% [$F(5, 253955) = 19{,}462.01$; $p < .001$]. The mental health risk factors and protective factors explained 16% of the variance in suicide risk after controlling for SGM status [$F\Delta(4, 253{,}955) = 13{,}877.53$; $p < .001$]. In the final model, all of the independent variables were statistically significant ($p < .001$). SGM status had the strongest effect (β = .26), followed closely by loneliness (β = .25), substance use risk (β = .18), resilience (β = -.12), and perceived sense of belonging (β = -.10).

Table 2.5

Hierarchical Linear Regression on Suicide Risk

Variable	*B*	*SE B*	β	*sr*	R^2	ΔR^2
Step 1					.12	.12***
Constant	2.31	.02				
SGM Status	2.45	.01	.35***	.35		
Step 2					.28	.16***
Constant	3.26	.04				
SGM Status	1.83	.01	.26***	.25		
Substance Use Risk	.03	.00	.18***	.17		
Loneliness	.42	.00	.25***	.23		
Resilience	-.25	.00	-.12***	-.12		
PSOB	-.29	.00	-.10***	-.09		

Note: SGM = sexual and gender minority; PSOB = perceived sense of belonging; ***$p < .001$

Results for psychological well-being are shown in Table 2.6. SGM status was entered in Step 1, which was significant (β = -.20; $p < .001$) and explained 4% of the variance in psychological well-being. After entry of the mental health risk factors and protective factors in Step 2, the total variance explained by the model was 46% [$F(5, 253{,}677) = 42{,}349.56$; $p < .001$]. The mental health risk factors and protective factors explained 41% of the variance in psychological well-being after controlling for SGM status [$F\Delta(4, 253{,}677) = 48{,}102.89$; $p < .001$]. In the final model, all of the independent variables were statistically significant ($p < .001$). Resilience had the strongest effect (β = .34), followed by loneliness (β = -.29), perceived sense of belonging (β = .27), SGM status (β = -.08), and substance use risk (β = -.03).

Table 2.6

Hierarchical Linear Regression on Psychological Well-Being

Variable	*B*	*SE B*	β	*sr*	R^2	ΔR^2
Step 1					.04	.04***
Constant	49.5	.05				
SGM Status	-3.93	.04	-.20***	-.20		
Step 2					.46	.41***
Constant	32.46	.10				
SGM Status	-1.53	.03	-.08***	-.08		
Substance Use Risk	-.02	.00	-.03***	-.26		
Loneliness	-1.32	.01	-.29***	-.26		
Resilience	1.93	.01	.34***	.32		
PSOB	2.14	.01	.27***	.25		

Note: SGM = sexual and gender minority; PSOB = perceived sense of belonging; ***$p < .001$

Multiple regression analyses were conducted to determine the impact of sexual orientation, gender identity, presence of life stressors, substance use risk, loneliness, resilience, and perceived sense of belonging on mental health outcomes (i.e., psychological distress, suicide risk, and psychological well-being) in undergraduate students. Sexual orientation was dummy coded with heterosexual as the reference group, and gender identity was dummy coded with cisgender as the reference group.

Results for psychological distress are shown in Table 2.7. The total variance in psychological distress explained by the model was 45% [$F(7, 246{,}415) = 27{,}897.49$; $p < .001$]. In the final model, all of the independent variables were statistically significant ($p < .001$). Loneliness had the strongest effect (β = .32), followed by life stressors (β = .26), resilience (β = -.22), perceived sense of belonging (β = -.10), sexual orientation (β = .09), substance use risk (β = .05), and gender identity (β = .03).

Table 2.7

Standard Multiple Regression on Psychological Distress

Variable	*B*	*SE B*	β	*sr*
Constant	7.75	.06		
Sexual Orientation	1.10	.02	.09***	.09
Gender Identity	.70	.04	.03***	.03
Life Stressors	.42	.00	.26***	.24
Substance Use Risk	.02	.00	.05***	.05
Loneliness	.91	.01	.32***	.28
Resilience	-.77	.01	-.22***	-.21
PSOB	-.47	.01	-.10***	-.09

Note: PSOB = perceived sense of belonging; ***$p < .001$

Results for suicide risk are shown in Table 2.8. The total variance in suicide risk explained by the model was 32% [$F(7, 243{,}665) = 16{,}140.84$; $p < .001$]. In the final model, all of the independent variables were statistically significant ($p < .001$). Both sexual orientation and life stressors had the strongest effect (β = .20), followed closely by loneliness (β = .19), substance use risk (β = .14), resilience (β = -.11), gender identity (β = .09), and perceived sense of belonging (β = -.08).

Table 2.8

Standard Multiple Regression on Suicide Risk

Variable	*B*	*SE B*	β	*sr*
Constant	4.29	.04		
Sexual Orientation	1.46	.01	.20***	.19
Gender Identity	1.25	.03	.09***	.08
Life Stressors	.19	.00	.20***	.18
Substance Use Risk	.03	.00	.14***	.13
Loneliness	.33	.00	.19***	.17
Resilience	-.22	.00	-.11***	-.10
PSOB	-.23	.01	-.08***	-.07

Note: PSOB = perceived sense of belonging; ***p < .001

Results for psychological well-being are shown in Table 2.9. The total variance in psychological well-being explained by the model was 46% [$F(7, 243{,}428) = 29{,}335.97$; $p < .001$]. In the final model, all of the independent variables were statistically significant

($p < .001$). Resilience had the strongest effect (β = .34), followed by loneliness, (β = -.28), perceived sense of belonging (β = .26), sexual orientation (β = -.06), life stressors (β = -.05), gender identity (β = -.03), and substance use risk (β = -.02).

Table 2.9

Standard Multiple Regression on Psychological Well-Being

Variable	*B*	*SE B*	β	*sr*
Constant	31.53	.10		
Sexual Orientation	-1.20	.03	-.06***	-.06
Gender Identity	-1.28	.06	-.03***	-.03
Life Stressors	-.12	.00	-.05***	-.04
Substance Use Risk	-.01	.00	-.02***	-.02
Loneliness	-1.26	.01	-.28***	-.24
Resilience	1.89	.01	.34***	.32
PSOB	2.10	.01	.26***	.24

Note: PSOB = perceived sense of belonging; ***p < .001

In summary, there were significant differences in mental health outcomes and mental health risk factors and protective factors between SGM and non-SGM students. SGM students had greater levels of psychological distress and suicide risk, as well as substance use risk and loneliness, than non-SGM students. Conversely, SGM students had lower levels of psychological well-being, resilience, and perceived sense of belonging than non-SGM students.

The hierarchical linear regression analyses yielded significant models for each mental health outcome. Loneliness and resilience were the strongest predictors of psychological distress, SGM status and loneliness were the strongest predictors of suicide risk, and resilience and loneliness were the strongest predictors of psychological well-being in undergraduate students. The multiple regression analyses also yielded significant models for each mental health outcome. Loneliness and life stressors were the strongest predictors of psychological distress, sexual orientation and life stressors were the

strongest predictors of suicide risk, and resilience and loneliness were the strongest predictors of psychological well-being in undergraduate students.

CHAPTER FIVE

DISCUSSION

The purpose of this study was twofold: first, to compare the overall mental health of SGM and non-SGM undergraduate students in the United States using validated mental health instruments administered through a national survey of college students. Second, to identify factors that predict mental health outcomes among undergraduate students in the United States using validated mental health instruments administered through a national survey of college students.

Results demonstrated that SGM students experience significantly higher levels of negative mental health outcomes (i.e., psychological distress and suicide risk) compared to non-SGM peers. The findings align with recent secondary analyses of NCHA data, which similarly reported elevated levels of psychological distress (Ostermiller et al., 2024; Russell et al., 2024), and increased rates of suicidal ideation and suicide attempts among SGM students (Liu et al., 2019; Pascale & DeVita, 2024; Samek et al., 2024). This disparity is further supported by evidence of a higher prevalence of anxiety, depression, and self-harm behaviors, among SGM college students (Lipson et al., 2019; Liss & Wilson, 2022; Pagliaccio, 2024; Parchem et al., 2024).

Conversely, SGM students reported a significantly lower level of psychological well-being, a trend supported by existing studies targeting college students' mental health (Lipson et al., 2022; Parr, 2022; Russell et al., 2024).

The persistent gap in mental health outcomes remain a critical concern; however, it is vital to emphasize that SGM identity is not inherently pathological. In accordance with the minority stress model (Meyer, 2003), these disparities are identifiable stressors

and environmental influences. Recent research indicates that despite marked improvements in the social and legal environments over the last fifty years, psychological distress and suicide attempts have not significantly declined, suggesting that the norms of heterosexism and cisgenderism remain deeply embedded within U.S. institutional structures and culture, and persist despite legal progress (Meyer et al., 2021). Consequently, addressing these disparities requires shifting from individual deficit-based understanding framework to a structural understanding of mental health. For example, a perceived sense of belonging on campus has been shown to substantially buffer risk of psychological distress and suicide risk in SGM students (Williams et al., 2021), suggesting that the problem is not a lack of individual resilience, but rather hostile institutional and social environments. Therefore, campus and institution-level reforms that enforce nondiscrimination and anti-harassment are essential in combating mental health disparities.

Beyond the disparities in mental health outcomes, this study revealed significant differences in mental health risk factors (i.e., substance use risk and loneliness) and protective factors (i.e., resilience and perceived sense of belonging) between SGM and non-SGM students. Specifically, SGM students reported significantly higher levels of substance use risk and loneliness than non-SGM students. Furthermore, they exhibited significantly lower levels of resilience and perceived sense of belonging compared to non-SGM students.

Previous literature demonstrated significantly elevated substance use across various substances among SGM college students. Qeadan et al. (2022) found that among American Indian, Alaska Native, and Native Hawaiian college students, transgender

students had 4.43 times higher odds of substance use disorder diagnosis compared to cisgender females; gay and lesbian students had 2.95 times higher odds; and bisexual students had 1.97 times higher odds of substance use disorder diagnosis compared to their heterosexual peers. While these disparities appear to be driven by systematic discrimination and minority stress, they are notably buffered by protective factors like institutional belonging and peer support.

The finding of increased loneliness among SGM young adults is consistently documented throughout the literature. For example, a comprehensive global study by Elmer et al. (2025) reported significantly higher levels of loneliness among the SGM population, with the most pronounced effects seen in emerging adults (ages 18-24 years). This study further identified several minority stressors, such as sexual orientation marginalization, internalized homonegativity, identity concealment, and stigma preoccupation, as key contributors to increased social and emotional loneliness among SGM adults.

Research examining mental health through the lens of minority stress and resilience models indicates that SGM students exhibit lower resilience largely due to insecurities related to safety, food, and housing (Xi & Peralta, 2025). In contrast, studies of older SGM adults found only modest differences in health outcomes compared to their non-SGM peers, despite the former group reporting higher levels of social and economic stressors (Branstrom et al., 2025). This suggests that resilience in SGM individuals may be a longitudinal trait shaped by their life experiences and navigating the adversity over time (Branstrom et al., 2025). Consequently, the lower resilience levels observed in college-aged SGM students should be viewed as a reflection of structural barriers such as

housing and food insecurity rather than an inherent lack of coping capacity. Identifying these environmental barriers is essential for developing targeted support systems on college campuses.

Research on the perceived sense of belonging in SGM college students has consistently shown that SGM college students report a lower perceived sense of belonging on campus than their non-SGM peers (Liss & Wilson, 2022; Pagliaccio, 2024; Parr, 2022; Wilson & Liss, 2020). In addition, SGM students tend to describe their campus climate as less supportive of their mental health and well-being compared to their non-SGM peers, a perception which is closely linked to diminished belonging (Hoban et al., 2025).

A recent study on campus climate and sense of belonging in SGM college students found that diversity, equity, and inclusion (DEI) initiatives did not directly affect mental health outcomes; rather, greater exposure to DEI initiatives was associated with a more positive campus climate. This improved environment, in turn, fostered stronger feelings of belonging on campus and was linked to fewer negative mental health outcomes (McField et al., 2025). Furthermore, perceived sense of belonging serves as critical protective factor. For example, a study of nearly 500 SGM college students in Oregon found that higher levels of institutional belonging buffered the associations between distal minority stress and psychological distress among students (Fahey et al., 2025). These findings highlight how targeted interventions and policies to improve campus climate and social support for SGM college students could benefit their mental health and well-being.

Results from the hierarchical linear regression analyses indicated that, even after accounting for SGM status, each of the investigated mental health risk factors and protective factors significantly influenced both negative and positive mental health outcomes in undergraduate students. Loneliness and resilience (or lack thereof) emerged as the strongest predictors of psychological distress, whereas resilience and loneliness (or lack thereof) were the strongest predictors of psychological well-being in undergraduate students. These findings align with recent large-scale research such as a secondary analysis of 2023-2024 Healthy Minds Study, which found that loneliness was significantly positively associated with moderate-to-severe depression and anxiety (Sullivan et al. 2025). Conversely, the same study demonstrated that resilience had a strong protective effect, showing a significant negative association with those same mental health challenges (Sullivan et al., 2025). The fact that these relationships persisted even after controlling for campus climate and other sociodemographic variables suggests that the harmful impact of loneliness and buffering impact of resilience likely persist across diverse student populations (Sullivan et al., 2025).

Regarding suicide risk, SGM status remained the strongest predictor in the model. This aligns with existing literature confirming substantially elevated rates of suicidal ideation, planning, and attempts among SGM individuals compared to their heterosexual, cisgender peers (Horwitz et al., 2020; Manges et al. 2024). Notably, however, it is critical to recognize that there is important heterogeneity within the SGM population. A latent class analysis of sexual minority college students (using data from the 2021-2022 Healthy Minds Study) identified three distinct classes: resilient (characterized by low suicide risk and high protective factors), at-risk (characterized by elevated suicide risk and suicidal

thoughts/behaviors), and discriminated-against (characterized by high levels of identity-based discrimination) (Cook, 2025). This variability suggests that SGM status alone is not a solitary predictor of suicide risk; rather, the strength of this association is significantly moderated by experiences of discrimination, access to protective factors, and availability of resilience resources (Cook, 2025). Consequently, suicide prevention efforts should target the systemic and interpersonal discrimination that SGM students face rather than viewing SGM identity itself as inherently pathological. Campus-based interventions should prioritize structural changes that reduce victimization, create inclusive environments that foster sense of belonging, build social support networks, and teach resilience skills. These actions may show promise in reducing the elevated suicide risk among SGM college students.

Additional strong predictors of suicide risk in the hierarchical model were loneliness and substance use risk. These findings were supported by a recent study of nearly 1000 college students during the COVID-19 pandemic, which reported significant associations between suicidal ideation and loneliness as well as alcohol use disorder (Hamdan et al., 2024). The evidence suggests that identifying college students with substance use disorders should be a priority for suicide prevention efforts. Institutions can implement screening programs and interventions targeting students with substance use concerns, especially when combined with other risk factors like loneliness, as part of comprehensive campus mental health strategies.

Lastly, results from the multiple regression analyses mainly echoed those of the hierarchical linear regression analyses. However, a notable difference in these analyses was the inclusion of life stressors as a predictor variable for mental health outcomes, as

described in the minority stress model. Indeed, life stressors were a strong predictor for both of the negative mental health outcomes examined (i.e., psychological distress and suicide risk), a finding supported by existing literature. For example, research in college students during the COVID-19 pandemic revealed that, before the pandemic, stress mediated the positive relationship between loneliness and depression in college students (Krendl, 2023). However, during the pandemic, stress predicted college students' worse mental health outcomes more so than loneliness alone (Krendl, 2023). An additional longitudinal study during the COVID-19 pandemic identified chronic stress and COVID-19-related stressors, such as social isolation and distanced learning, as significant predictors of anxiety and depression symptoms in first-year college students (Fruehwirth et al., 2025). The study also found that mental health symptoms increased significantly as stressors accumulated, and that resilience served as a protective factor that could buffer against these negative effects (Fruehwirth et al., 2025). These findings suggest that addressing, reducing, and managing sources of life stressors, whether academic, financial, social, or health-related, should be a key component of college mental health interventions.

While it is important to identify and mitigate life stressors for all college students, it is especially crucial to identify specific sources of stress for SGM college students since they are disproportionately affected by negative mental health outcomes compared to their non-SGM peers (Pagliaccio, 2024). As mentioned previously, the minority stress model argues that SGM individuals experience unique minority stressors that contribute to the development of these negative mental health outcomes (Meyer, 2003). While the present study was unable to differentiate between general life stressors and sources of

minority stress, Busby and colleagues (2019) identified minority stressors that impact SGM college students' mental health. Their online survey of over 800 SGM students across the U.S. found that victimization (i.e., verbal or physical threats or assault in the past six months) was positively associated with depression severity, suicidal ideation, suicide attempt history, and non-suicidal self-injury (Busby et al., 2019). Discrimination (e.g., feeling threatened or harassed) also showed similarly harmful effects, being positively associated with depression severity, suicide attempt history, and non-suicidal self-injury (Busby et al., 2019). Although the study focused on SGM college students, the scales utilized in this study were not specific to perceived reason for victimization and/or discrimination. As such, it is difficult to know with certainty whether these experiences of victimization and/or discrimination were believed to be the result of the students' sexual and/or gender minority identities. Future studies should attempt to ascertain the perceived reasoning behind the stressor so that interventions designed to reduce them can be more effective.

Limitations

There were several limitations in this study. First, this study is a secondary data analysis of a national survey of college students. As such, the author had no control over survey design or data collection methods. Second, the study sample was primarily White, which may limit generalizability of findings to other races and ethnicities. Third, the variables of sexual orientation, gender identity, and SGM status were dichotomized into heterosexual vs non-heterosexual, cisgender vs transgender/gender nonconforming, and SGM vs non-SGM, respectively. While it is crucial to have recent, accurate statistical estimates of disparities in mental health among SGM and non-SGM students,

dichotomizing these variables fails to capture the complexity of individual identities. When feasible and aligned with study aims, future research should examine within-group differences among sexual minority and gender minority subgroups in order to develop appropriately tailored interventions. Similarly, this study did not address intersecting identities, or how various identities such as race, sexual orientation, gender identity, socioeconomic status, and religion, interact with one another to shape an individual's unique experiences of privilege and oppression (Crenshaw, 1989). Future studies would benefit from exploring these identities in more detail and how their interactions influence mental health outcomes in undergraduate college students.

Conclusion

Understanding mental health outcomes and the factors that influence them in undergraduate college students is crucial for improving the mental health and well-being of this population. This study strengthens the existing literature by providing updated estimates of mental health disparities from a national sample of SGM and non-SGM students. However, the fact that these disparities persist despite accumulating evidence suggests a gap between research and institutional action. Reducing these disparities requires a commitment to transforming campus climates, allocating resources aligned with the needs of specific student populations, and holding institutions accountable for creating genuinely inclusive environments where all students can thrive.

References

Abreu, R. L., & Kenny, M. C. (2017). Cyberbullying and LGBTQ Youth: A systematic literature review and recommendations for prevention and intervention. *Journal of Child and Adolescent Trauma, 11*(1), 81-97. https://doi.org/10.1007/s40653-017-0175-7

Active Minds. (2024). Loneliness, resilience, and mental health: A call for campus action. https://activeminds.org/resource/loneliness-resilience-and-mental-health/

Adlard, R. J., Roos, T., & Temmingh, H. (2023). Alcohol, smoking, and substance involvement screening test validity in bipolar and psychotic disorders. *South African Journal of Psychiatry, 29*(0), a2109. https://doi.org/10.4102/sajpsychiatry.v29i0.2109

Allen, K., Kern, M. L., Rozek, C. S., McInereney, D., & Slavich, G. M. (2021). Belonging: A review of conceptual issues, an integrative framework, and directions for future research. *Australian Journal of Psychology, 73*(1), 87-102. https://doi.org/10.1080/0049530.2021.1883409

Aloba, O., Ojeleye, O., & Aloba, T. (2017). The psychometric characteristics of the 4-item Suicidal Behaviors Questionnaire-Revised (SBQ-R) as a screening tool in a non-clinical sample of Nigerian university students. *Asian Journal of Psychiatry, 26*, 46-51. https://doi.org/10.1016/j.ajp.2017.01.017

American College Health Association. (2019). *National College Health Assessment III Codebook* (revised March 27, 2023). https://www.acha.org/wp-content/uploads/ACHANCHA_III_Spring_2023_Codebook_3_27_2023.pdf

American College Health Association. (2025). *National college health assessment.*

https://www.acha.org/ncha/

American Psychiatric Association. (2024, January 30). *New APA poll: One in three Americans feels lonely every week.* https://www.psychiatry.org/News-room/News-Releases/New-APA-Poll-One-in-Three-Americans-Feels-Lonely-E

American Psychological Association (2018, April 19). *APA dictionary of psychology.* https://dictionary.apa.org/

American Psychological Association. (2008, October 29). *Understanding sexual orientation and homosexuality.* https://www.apa.org/topics/lgbtq/orientation

Arnett, J. J. (2014). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480. https://doi.org/10.1037/0003-066X.55.5.469

Bonnie, R. J., Stroud, C., & Breiner, H. (2015). Education and employment. In *Investing in the health and well-being of young adults.* National Academies Press.

Borgogna, N. C., Lathan, E. C., & Aita, S. L. (2023). Sexual and gender minority victimization: Base rates of assault in college students across sexual and gender identities. *Journal of Interpersonal Violence, 38*(8), 5613-5637. https://doi.org/10.1177/08862605221124253

Branstrom, R., Kleijberg, M., & Siverskog, A. (2025). Resilience and distinct lifeways: Sexual orientation and gender minority status differences in health, well-being, and social determinants of health in a population-based sample of older adults. *BMC Public Health, 25*, 4276. https://doi.org/10.1186/s12889-025-25426-w

Bruffaerts, R., Mortier, P., Kiekens, G., Auerbach, R. P., Cuijpers, P., Demyttenaere, K.,

Green, J. G., Nock, M. K., & Kessler, R. C. (2018). Mental health problems in college freshmen: Prevalence and academic functioning. *Journal of Affective Disorders, 225*(1), 97-103. https://doi.org/10.1016/j.jad.2017.07.044

Bulfone, G., Ingravalle, F., Scerbo, F., Mazzotta, R., Simonelli, I., Pancaldi, A., Ungaro, S., Cocco, M., Vellone, E., Alvaro, R., Vinci, A., & Maurici, M. (2025). Substance use and academic performance among university students: A systematic review and meta-analysis. *BMC Medical Education, 25*(1), 959. https://doi.org/10.1186/s12909-025-07530-y

Busby, D. R., Horwitz, A. G., Zheng, K., Eisenberg, D., Harper, G. W., Albucher, R. C., Roberts, L. W., Favorite, T., Coryell, W., Pistorello, J., & King, C. A. (2019). Suicide risk among gender and sexual minority college students: The roles of victimization, discrimination, connectedness, and identity affirmation. *Journal of Psychiatric Research,* 182-188. https://doi.org/10.1016/j.psychires.2019.11.013

Cacioppo, J. T., Hughes, M. E., Waite, L. J., Hawkley, L. C., & Thisted, R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: Cross-sectional and longitudinal analyses. *Psychology of Aging, 21*(1), 140-151. https://doi.org/10.1037/0882-7974.21.1.140

Campbell-Montalvo, R., Malaykhan, M., Smith, C. A. S., Miller, M. H., Puccia, E., Mayberry, M., Skvoretz, J., & Wao, H. (2022). Sexual and gender minority undergraduates' relationships and strategies for managing fit in STEM. *PLoS ONE, 17*(3), e0263561. https://doi.org/10.1371/journal.pone.0263561

Caspi, A., Harrington, H. L., & Moffitt, T. E. (2006). Socially isolated children 20 years

later: Risk of cardiovascular disease. *Archives of Pediatric and Adolescent Medicine, 160*(8), 805-811. https://doi.org/10.1001/archpedi.160.8.805

Chai, L. (2023). Perceived community belonging as a moderator of the association between sexual orientation and health and well-being. *American Journal of Health Promotion, 38*(3), 325-338. https://doi.org/10.1177/08901171231204472

Chang, A. R., Rastogi, R., Woolverton, G. A., Chen, J. A., Stevens, C., Reisner, S. L., & Liu, C. H. (2024). Mental health help-seeking willingness among U.S. college students: A resilience factor associated with many sexual minority identities. *Psychiatry Research,* 342. https://doi.org/10.1016/j.psychres.2024.116173

Charmaraman, L., Zhang, A., Wang, K., & Chen, B. (2024). Sexual minorities and loneliness: Exploring sexuality through social media and gender-sexuality alliance (GSA) supports. *International Journal of Environmental Research and Public Health, 21*(3), 300. https://doi.org/10.3390/ijerph21030300

Chua, J. H., Cheng, C. K. T., Cheng, L. J., Ang, W. H. D., & Lau, Y. (2023). Global prevalence of resilience in higher education students: A systematic review, meta-analysis, and meta-regression. *Current Psychology, 42*, 22645-22663. https://doi.org/10.1007/s12144-022-03366-7

Clark, J. A., Engelman, M., Schultz, A. A., Bersch, A. J., & Malecki, K. (2024). Sense of neighborhood belonging and health: Geographic, racial, and socioeconomic variation in Wisconsin. *Frontiers in Public Health, 12:1376672.* https://doi.org/10.3389/pubh.2024.1376672

Cook, K. (2025). Suicide risk and protective factors for sexual minority college students:

A latent class analysis. *Journal of Death and Dying*. https://doi.org/10.1177/00302228251390153

Crenshaw, K. W. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *University of Chicago Legal Forum, 1989*(1).

De Luca, S. M., Franklin, C., Yueqi, Y., Johnson, S., & Brownson, C. (2016). The relationship between suicide ideation, behavioral health, and college academic performance. *Community Mental Health Journal, 52*, 534-540. https://doi.org/10.1007/s10597-016-9987-4

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*(1), 34-43. https://doi.org/10.1037/0003-066X.55.1.34

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research, 97*(2), 143-156. https://doi.org/10.1007/s11205-009-9493-y

Duffy, M. E., Twenge, J. M., & Joiner, T. E. (2019). Trends in mood and anxiety symptoms and suicide-related outcomes among U.S. undergraduates, 2007-2018: Evidence from two national surveys. *Journal of Adolescent Health, 65*(5), 590-598. https://doi.org/10.1016/j.adohealth.2019.04.033

Dyar, C. (2022). A review of disparities in cannabis use and cannabis use disorder

affecting sexual and gender minority populations and evidence for contributing factors. *Current Addiction Reports, 9*(4), 589-597. https://doi.org/10.1007/s40429-022-00452-5

Dyar, C., Lee, C. M., Rhew, I. C., & Kaysen, D. (2023). Sexual minority stress and substance use: An investigation of when and under what circumstances minority stress predicts alcohol and cannabis use at the event-level. *Journal of Psychopathology and Clinical Science, 132*(4), 475-489. https://doi.org/10.1037/abn0000819

Eisenberg, D., Lipson, S. K., Heinze, J., & Zhou, S. (2023). *The healthy minds study: 2022-2023 data report.* https://healthymindsnetwork.org/wp-content/uploads/2023/08/HMS_National-Report-2022-2023_full.pdf

Elmer, E. M., van Tilburg, T. G., & Fokkema, T. (2025). Age and gender identity in the relationship between minority stress and loneliness: A global sample of sexual and gender minority adults. *The Journal of Sex Research, 62*(6), 1080-1099. https://doi.org/10.1080/00224499.2024.2339511

Fahey, K. M. L., Uhrig, A., Penta, S., & Kovacek, K. (2025). Examining associations between protective factors, distal minority stress, substance use, and mental health in LGBTQ+ postsecondary students. *Journal of American College Health, 73*(5), 1-10. https://doi.org/10.1080/07448481.2025.2510692

Flesaker, M., Freibott, C. E., Evans, T. C., Gradus, J. L., & Lipson, S. K. (2025). Loneliness in the college student population: Prevalence and associations with substance use outcomes. *Journal of American College Health, 73*(8), 3255-3261. https://doi.org/10.1080/077448481.2024.2400105

Fruehwirth, J. C., Huang, L., Tompson, C. E., & Perreira, K. M., (2025). Mental health symptoms among US college students before, early, and late into the COVID-19 pandemic: A longitudinal analysis. *Journal of Adolescent Health, 76*(2), 246-253. https://doi.org/10.1016/j.jadohealth.2024.09.026

Garvey, J. C., Rankin, S., Beemyn, G., & Windmeyer, S. (2017). Improving the campus climate for LGBTQ students using the campus pride index. In K. M. Goodman, & D. Cole (Eds.), *Using data-informed decision making to improve student affairs practice* (New Directions for Student Services, no. 159, pp. 61-70). Jossey-Bass. https://doi.org/10.1002/ss.20227

Garvey, J. C., Taylor, J. T., & Rankin, S. (2015). An examination of campus climate for LGBTQ community college students. *Community College Journal of Research and Practice, 39*(6), 527-541. https://doi.org/10.1080/10668926.2013.861374

Gmelin, J. H., De Vries, Y. A., Baams, L., Aguilar-Gaxiola, S., Alonso, J., Borges, G., Bunting, B., Cardoso, G., Florescu, S., Gureje, O., Karam, E. G., Kawakami, N., Lee, S., Mneimneh, Z., Navarro-Mateu, F., Posada-Villa, J., Rapsey, C., Slade, T., Stagnaro, J. C., …, de Jonge, P. (2022). Increased risk for mental disorders among LGB individuals: Cross-national evidence from the world mental health surveys. *Social Psychiatry and Psychiatric Epidemiology, 57*(11), 2319-2332. https://doi.org/10.1007/s00127-022-02320-z

Goldbach, J. T., Tanner-Smith, E. E., Bagwell, M., & Dunlap, S. (2014). Minority stress and substance use in sexual minority adolescents: A meta-analysis. *Prevention Science, 15*(3), 350-363. https://doi.org/10.1007/s11121-013-0393-7

Goldberg, A. E., Beemyn, G., & Smith, J. Z. (2019). What is needed, what is valued:

Trans' students' perspectives on trans-inclusive policies and practices in higher education. *Journal of Educational and Psychological Consultation, 29*(1), 27-67. https://doi.org/10.1080/10474412.2018.1480376

Gong, Z., Wang, H., Zhong, M., & Shao, Y. (2023). College students' learning stress, psychological resilience and learning burnout: Status quo and coping strategies. *BMC Psychiatry, 23*, 389. https://doi.org/10.1186/s12888-023-04783-z

Gopalan, M., & Brady, S. T. (2019). College students' sense of belonging: A national perspective. *Educational Researcher, 49*(2), 134-137. https://doi.org/10.3102/0013189X19897622

Gow, A. J., Pattie, A. Whiteman, M. C., Whalley, L., & Deary, I. (2007). Social support and successful aging. *Journal of Individual Differences, 28*(3), 103-115. https://doi.org/10.1027/1614-0001.28.3.106

Gryczynski, J., Kelly, S. M., Mitchell, S. G., Kirk, A., O'Grady, K. E., & Schwartz, R. P. (2015). Validation and performance of the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) among adolescent primary care patients. *Addiction, 110*(2), 240-247. https://doi.org/10.1111/add.12767

Hagerty, B. M. K., Lynch-Sauer, J., Patusky, K. L., Bouwsema, M., & Collier, P. (1992). Sense of belonging: A vital mental health concept. *Archives of Psychiatric Nursing, 6*(3), 172-177. https://doi.org/10.1016/0883-9417(92)90028-H

Hale, C. J., Hannum, J. W., & Espelage, D. L. (2005). Social support and physical health: The importance of belonging. *Journal of American College Health, 53*(6), 276-284. https://doi.org/10.3200/JACH.53.6.276-284

Hamdan, S., Guz, T., & Zalsman, G. (2024). The clinical sequelae of the COVID-19

pandemic: Loneliness, depression, excessive alcohol use, social media addiction, and risk for suicide ideation. *Archives of Suicide Research, 29*(1), 238-251. https://doi.org/10.1080/13811118.2024.2345170

Hawkley, L. C., & Capitanio, J. P. (2015). Perceived social isolation, evolutionary fitness and health outcomes: A lifespan approach. *Philosophical Transactions of the Royal Society of London, Series B, 370:20140114.* https://doi.org/10.1098/rstb.2014.0114

Henderson, E. R., Sang, J. M., Louth-Marquez, W., Egan, J. E., Espelage, D., Friedman, M., & Coulter, R. W. S. (2022). "Words aren't supposed to hurt, but they do": Sexual and gender minority youth's bullying experiences. *Journal of Interpersonal Violence, 37*(12), 8747-8766. https://doi.org/10.1177/0886260520978199

Hendricks, M. L., & Testa, R. J. (2012). A conceptual framework for clinical work with transgender and gender nonconforming clients: An adaptation of the minority stress model. *Professional Psychology: Research and Practice, 43*(5), 460-467. https://doi.org/10.1037/a0029597

Hoban, M. T., Kukich, C., & Duran, A. (2025). Mental health outcomes and self-harm issues facing LGBTQ+ students. *New Directions for Higher Education, 2025*(210), 47-54. https://doi.org/10.1002/he.20531

Holt-Lunstad, J. (2018). Why social relationships are important for physical health: A systems approach to understanding and modifying risk and protection. *Annual Review of Psychology, 69*, 437-458. https://doi.org/10.1146/annurev-psych-122216-011902

Horwitz, A. G., Berona, J., Busby, D. R., Eisenberg, D., Zheng, K., Pistorello, J., Albucher, R., Coryell, W., Favorite, T., Walloch, J. C., & King, C. A. (2020). Variation in suicide risk among subgroups of sexual and gender minority college students. *Suicide and Life-Threatening Behavior, 50*(5), 1041-1053. https://doi.org/10.1111/sltb.12637

Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging, 26*(6), 655-672. https://doi.org/10.1177/0164027504268574

Human Rights Campaign. (2023, May 31). *Glossary of terms.* https://www.hrc.org/resources/glossary-of-terms

Humeniuk, R., Ali, R., Babor, T. F., Farrell, M., Formigoni, M. L., Jittiwutikarn, J., De Lacerda, R. B., Ling, W., Marsden, J., Monteiro, M., Nhiwatiwa, S., Pal, H., Poznyak, V., & Simon, S. (2008). Validation of the alcohol, smoking, and substance use involvement screening test (ASSIST). *Addiction, 103*(6), 1039-1047. https://doi.org/10.1111/j.1360-0443.2007.02114.x

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S.-L. T., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*(6), 959-976. https://doi.org/10.1017/S0033291702006074

Kittiteerasack, P., Matthews, A. K., & Steffen, A. D. (2022). Loneliness mediates the

association of minority stress and depression in sexual and gender minority populations in Thailand. *Research in Nursing & Health, 45*(5), 580-591. https://doi.org/10.1002/nur.22255

Krendl, A. C. (2023). Changes in stress predict worse mental health outcomes for college students than does loneliness; evidence from the COVID-19 pandemic. *Journal of American College Health, 71*(1), 40-43. https://doi.org/10.1080/07448481.2021.1887198

LeCroy, V. R., Cole, M. O. R., & Rodefer, J. S. (2024). Drug use and attitudes among sexual and gender minority college students. *North American Journal of Psychology, 26*(3), 511-526.

Lipson, S. K., Raifman, J., Abelson, S., & Reisner, S. L. (2019). Gender minority mental health in the U.S.: Results of a national survey on college campuses. *American Journal of Preventive Medicine, 57*(3), 293-301. https://doi.org/10.1016/j.amepre.2019.04.025

Lipson, S. K., Zhou, S., Abelson, S., Heinze, J., Jirsa, M., Morigney, J., Patterson, A., Singh, M., & Eisenberg, D. (2022). Trends in college student mental health and help-seeking by race/ethnicity: Findings from the national healthy minds study, 2013-2021. *Journal of Affective Disorders, 306*, 138-147. https://doi.org/10.1016/j.jad.2022.03.038

Liss, M., & Wilson, L. C. (2022). Mental health and general psychological processes among asexual, bisexual, and gay/lesbian college students in the United States. *Psychology & Sexuality, 13*(4), 1041-1053. https://doi.org/10.1080/19419899.2021.1979634

Liu, C. H., Stevens, C., Wong, S. H. M., Yasui, M., & Chen, J. A. (2019). The prevalence and predictors of mental health diagnoses and suicide among U.S. college students: Implications for addressing disparities in service use. *Depression and Anxiety, 36*(1), 8-17. https://doi.org/10.1002/da.22830

Manges, M. E., Bryan, C., Bryan, A., Bauder, C. R., & Wastler, H. M. (2024). Suicidal thoughts and behaviors among gender and sexual minorities: Adults ages 18-24 show highest rates of past month suicidal thoughts. *Suicide and Life-Threatening Behaviors, 54*(6), 904-913. https://doi.org/10.1111/sltb.13093

Maslow, A. H. (1954). *Motivation and personality.* Harpers.

Mason, B. (2023). Mental health concerns for college students: Self-harm, suicidal ideation, and substance use disorders. *Primary Care, 50*(1), 47-55. https://doi.org/10.1016/j.pop.2022.10.007

Matud, M. P., Díaz, A., Bethencourt, J. M., & Ibáñez, I. (2020). Stress and psychological distress in emerging adulthood: A gender analysis. *Journal of Clinical Medicine, 9*(9), 2859. https://doi.org/10.3390/jcm9092859

McField, A. A., Rogers, M. L., Wilson, K. J., & Oberie, C. (2025). Campus climate and sense of belonging explain the relationship between DEI initiatives and mental health of LGBTQ+ college students. *Journal of American College Health*. https://doi.org/10.1080/07448481.2025.2577648

Mereish, E. H., Katz-Wise, S. L., & Woulfe, J. (2017). Bi-specific minority stressors, psychological distress, and suicidality in bisexual individuals: The mediating role of loneliness. *Prevention Science, 18*(6), 716-725. https://doi.org/10.1007/s11121-017-0804-2

Messman, J. B., & Leslie, L. A. (2019). Transgender college students: Academic resilience and striving to cope in the face of marginalized health. *Journal of American College Health, 67*(2), 161-173. https://doi.org/10.1080/07448481.2018.1465060

Meyer, I. H. (2015). Resilience in the study of minority stress and health of sexual and gender minorities. *Psychology of Sexual Orientation and Gender Diversity, 2*(3), 209-213. https://doi.org/10.1037/sgd0000132

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin, 129*(5), 674-697. https://doi.org/10.1037/0033-2909.129.5.674

Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior, 36*(1), 38-56. https://doi.org/10.2307/2137286

Meyer, I. H., Russell, S. T., Hammack, P. L., Frost, D. M., & Wilson. B. D. M. (2021). Minority stress, distress, and suicide attempts in three cohorts of sexual minority adults: A U.S. probability sample. *PLoS ONE, 16*(3), e0246827. https://doi.org/10.1371/journal.pone.0246827

Michalski, C. A., Diemert, L. M., Helliwell, J. F., Goel, V., & Rosella, L. C. (2020). Relationship between sense of community belonging and self-rated health across life stages. *SSM-Population Health, 12:100676.* https://doi.org/10.1016/j.ssmph.2020.100676

National Center for Education Statistics. (2023). Characteristics of postsecondary students. U.S. Department of Education, Institute of Education Services. https://nces.ed.gov/programs/coe/indicator/csb/postsecondary-students

Nguyen, D. J., Brazelton, G. B., Renn, K. A., & Woodford, M. R. (2018). Exploring the availability and influence of LGBTQ+ student services resources on student success at community colleges: A mixed methods analysis. *Community College Journal of Research and Practice, 42*(11), 783-796. https://doi.org/10.1080/10668926.2018.1444522

National Institutes on Drug Abuse. (2024). *Substance use and mental health.* https://nida.nih.gov/research-topics/mental-health

Osman, A., Bagge, C. L., Gutierrez, P. M., Konick, L. C., Kopper, B. A., & Barrios, F. X. (2001). The suicide behaviors questionnaire-revised (SBQ-R): Validation with clinical and nonclinical samples. *Assessment, 8*(4), 443-454. https://doi.org/10.1177/107319110100800409

Ostermiller, L., Anderson, A. R., Warlick, C. A., & Dahlen, E. R. (2024). Lifestyle behaviors and mental health outcomes in sexual and gender minority graduate students. *Journal of American College Health, 2024 Oct 10*:1-10. https://doi.org/10.1080/07448481.2024.2409704

Oswalt, S. B., & Wyatt, T. J. (2011). Sexual orientation and differences in mental health, stress, and academic performance in a national sample of U.S. college students. *Journal of Homosexuality, 58*(9), 1255-1280. https://doi.org/10.1080/00918369.2011.605738

Pagliaccio, D. (2024). Mental health disparities among sexual and gender minority students in higher education. *Journal of American College Health,* 1-12. https://doi.org/10.1080/07448481.2024.2404944

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM*

SPSS (7th ed.). Open University Press; McGraw-Hill Education.

Parchem, B., Wheeler, A., Talaski, A., & Molock, S. D. (2024). Comparison of anxiety and depression rates among LGBTQ college students before and during the COVID-19 pandemic. *Journal of American College Health, 72*(1), 31-39. https://doi.org/10.1080/07448481.2021.2013238

Parent, M. C., Arriaga, A. S., Gobble, T., & Wille, L. (2019). Stress and substance use among sexual and gender minority individuals across the lifespan. *Neurobiology of Stress, 10*, 100146. https://doi/org/10.1016/j.ynstr.2018.100146

Parr, N. J. (2022). Differences in the age-varying association of school belonging with socioemotional flourishing among minority and non-minority college and university students. *Journal of American College Health, 70*(5), 1336-1340. https://doi.org/10.1080/07448481.2020.1808662

Pascale, A. B., & DeVita, J. M. (2024). Transgender college students' mental health: Comparing transgender students to their cisgender peers. *Journal of American College Health, 72*(1), 135-141. https://doi.org/10.1080/07448481.2021.2024212

Pasman, E., Blair, L., Solberg, M. A., McCabe, S. E., Schepis, T., & Resko, S. M. (2024). The substance use disorder treatment gap among US college students: Findings from the 2021 National Survey on Drug Use and Health. *Drug and Alcohol Dependence Reports, 12*, 100279. https://doi.org/10.1016/j.dadr.2024.100279

Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior, 30*(3), 241-256. https://doi.org/10.2307/2136956

Perlman, D., & Peplau, L. A. (1981). *Toward a social psychology of loneliness.* London Academic Press.

Peyer, K. L., Hathaway, E. D., & Doyle, K. (2023). Gender differences in stress, resilience, and physical activity during the COVID-19 pandemic. *Journal of American College Health, 72*(2), 1-8. https://doi.org/10.1080/07448481.2022.2052075

Qeadan, F., Azagba, S., Barbeau, W. A., Gu, L. Y., Mensah, N. A., Komaromy, M., English, K., & Madden, E. F. (2022). Associations between discriminatino and substance use among college students in the United States from 2015 to 2019. *Addictive Behaviors,* 107164. https://doi.org/10.1016/j.addbeh.2021.107164

Russell, E. C., Abidogun, T. M., Lindley, L. L., & Griffin, K. W. (2024). Impact of the COVID-19 pandemic on university students' psychological distress, well-being, and utilization of mental health services in the United States: Populations at greatest risk. *Frontiers in Public Health, 12*:1442773. https://doi.org/10.3389/fpubh.2024.1442773

Samek, D. R., Akua, B. A., Crumly, B., & Duke-Marks, A. (2024). Increasing mental health issues in college students from 2016-2019: Assessing the intersections of race/ethnicity, gender, and sexual orientation. *Journal of Affective Disorders, 354,* 216-223. https://doi.org/10.1016/j.jad.2024.03.068

Schmidt, A. F., & Finan, C. (2018). Linear regression and the normality assumption. *Journal of Clinical Epidemiology, 98*, 146-151. https://doi.org/10.1016/j.clinepi.2017.12.006

Shoib, S., Amanda, T. W., Saeed, F., Ransing, R., Bhandari, S. S., Armiyau, A. Y.,

Gurcan, A., & Chandradasa, M. (2023). Association between loneliness and suicidal behaviour: A scoping review. *Turkish Journal of Psychiatry, 34*(2), 125-132. https://doi.org/10.5080/u27080

Southwick, S. M., Bonanno, G. A., Masten, A. S., Panter-Brick, C., Yehuda, R. (2014). Resilience definitions, theory, and challenges: Interdisciplinary perspectives. *European Journal of Psychotraumatology, 5*(10), 3402. https://doi.org/10.3402/ejpt.v5.25338

Strayhorn, T. L. (2018). *College students' sense of belonging: A key to educational success for all students.* Routledge.

Su, D., Irwin, J. A., Fisher, C., Ramos, A., Kelley, M., Mendoza, D. A. R., & Coleman, J. D. (2016). Mental health disparities within the LGBT population: A comparison between transgender and nontransgender individuals. *Transgender Health, 1*(1), 12-20. https://doi.org/10.1089/trgh.2015.0001

Substance Abuse and Mental Health Services Administration. (2024). *Key substance use and mental health indicators in the United States: Results from the 2023 National Survey on Drug Use and Health* (HHS Publication No. PEP24-07-021, NSDUH Series H-59). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. https://www.samhsa.gov/data/report/2023-nsduh-annual-national-report

Sullivan, P. J., Ruiz-Menjivar, J., Zhang, X., Carr, B. R., & Abraczinskas, M. (2025). Examining the impact of loneliness and resilience on mental health: Empirical evidence from a nationally representative sample of American college students.

European Psychiatry, 68(S1), S422-S423. https://doi.org/10.1192/j.eurpsy.2025.878

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson Education, Inc.

The Trevor Project. (2022). *2022 National Survey on LGBTQ Youth Mental Health.* The Trevor Project. https://www.thetrevorproject.org/survey-2022

Vaishnavi, S., Connor, K., & Davidson, J. R. T. (2007). An abbreviated version of the Connor-Davidson Resilience Scale (CD-RISC), the CD-RISC2: Psychometric properties and applications in psychopharmacological trials. *Psychiatry Research, 152*(2-3), 293-297. https://doi.org/10.1016/j.psychres.2007.01.006

Veldhuis, C. B., Cascalheira, C. J., Delucio, K., Budge, S. L., Matsuno, E., Huynh, K. Puckett, J. A., Balsam, K. F., Velez, B. L., & Galupo, M. P. (2024). Sexual orientation and gender diversity research manuscript writing guide. *Psychology of Sexual Orientation and Gender Diversity, 11*(3), 365-296. https://doi.org/10.1037/sgd0000722

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*(6023), 1447-1451. https://doi.org/10.1126/science.1198364

Welsh, J. W., Shentu, Y., & Sarvey, D. B. (2019). Substance use among college students. *Focus, 17*(2), 117-127. https://doi.org/10.1176/appi.focus.20180037

Williams, A. J., Jones, C., Arcelus, J., Townsend, E., Lazaridou, A., & Michail, M. (2021). A systematic review and meta-analysis of victimization and mental health prevalence among LGBTQ+ young people with experiences of self-harm and

suicide. *PLoS ONE, 16*(1), e0245268. https://doi.org/10.1371/journal.pone.0245268

Wilson, L. C., & Liss, M. (2022). Safety and belonging as explanations for mental health disparities among sexual minority college students. *Psychology of Sexual Orientation and Gender Diversity, 9*(1), 110-119. https://doi.org/10.1037/sgd0000421

Wojujutari, A. K., Idemudia, E. S., & Ugwu, L. E. (2024). Evaluation of reliability generalization of Conner-Davison Resilience Scale (CD-RISC-10 and CD-RISC-25): A meta-analysis. *PLoS ONE, 19*(11), e0297913. https://doi.org/10.1371/journal.pone.0297913

World Health Organization. (2022, June 17). *Mental health.* https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

World Health Organization. (2010). *The alcohol, smoking and substance involvement screening test (ASSIST): Manual for use in primary care.* https://www.who.int/publications/i/item/978924159938-2

World Health Organization. (1946). Constitution of the world health organization. *American Journal of Public Health and the Nations Health, 36*(11), 1245-1364. https://doi.org/10.2105/AJPH.36.11.1315

Wurster, K. G., Kivlighan, D. M. III, & Foley-Nicpon, M. (2021). Does person-group fit matter? A further examination of hope and belongingness in academic enhancement groups. *Journal of Counseling Psychology, 68*(1), 67-76. https://doi.org/10.1037/cou0000437

Xi, J., & Peralta, R. L. (2025). Mental health, resilience, and well-being among sexual minority college students: A study framed by the minority stress and minority resilience models. *Social Sciences, 14*(4), 231. https://doi.org/10.3390/socsci14040231

Xu, J., & Yang, X. (2023). The influence of resilience on stress reaction of college students during COVID-19: The mediating role of coping style and positive adaptive response. *Current Psychology, 1*(12). https://doi.org/10.1007/s12144-022-04214-4

Zahedi, H., Sahebihagh, M. H., & Sarbakhsh, P. (2022). The magnitude of loneliness and associated risk factors among university students: A cross-sectional study. *Iran Journal of Psychiatry, 17*(4), 411-417. https://doi.org/10.18502/ijps.v17i4.10690

Zhu, Y., Jha, S. C., Shutta, K. H., Huang, T., Balasubramanian, R., Clish, C. B., Hankinson, S. E., & Kubzansky, L. D. (2022). Psychological distress and metabolomic markers: A systematic review of posttraumatic stress disorder, anxiety, and subclinical distress. *Neuroscience & Biobehavioral Reviews, 143*, 104954. https://doi.org/10.1016/j.neubiorev.2022.104954

Appendix

OAKLAND UNIVERSITY

Institutional Review Board

Date: January 27, 2026

Study #: IRB-FY2026-233

Study Tile: Understanding Mental Health Outcomes among U.S. Undergraduate Students: A Comparative and Predictive Study of Sexual and Gender Minority (SGM) and Non-SGM Students

Submission Type: Initial

IRB Decision: Exempt

Research Team:
Brooke Golgiri
Suha Kridli

Based on applicable federal regulations, the above referenced study has been determined to be Exempt, with the following categories:
Category 4. Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met: (i) The identifiable private information or identifiable biospecimens are publicly available; (ii) Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects; (iii) The research involves only information collection and analysis involving the investigator's use of identifiable health information when that use is regulated under 45 CFR parts 160 and 164, subparts A and E, for the purposes of "health care operations" or "research" as those terms are defined at 45 CFR 164.501 or for "public health activities and purposes" as described under 45 CFR 164.512(b); or (iv) The research is conducted by, or on behalf of, a Federal department or agency using government-generated or government-collected information obtained for nonresearch activities, if the research generates identifiable private information that is or will be maintained on information technology that is subject to and in compliance with section 208(b) of the E-Government Act of 2002, 44 U.S.C. 3501 note, if all of the identifiable private information collected, used, or generated as part of the activity will be maintained in systems of records subject to the Privacy Act of 1974, 5 U.S.C. 552a, and, if applicable, the information used in the research was collected subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 et seq.

Notes for Researcher(s):
This submission includes the following documents:

- ACHA-NCHA III Codebook
- American College Health Association Data Use Permission Letter

Letter and Consent Document:
This letter along with the IRB approved (date-stamped) consent document can be found in Cayuse in the Submission Details page under Letters and Attachments, respectively. Please make sure to use the most recent IRB approved version of the consent form in consenting participants.

Permission from Research Site(s):
Please note the following:

- This IRB exemption determination letter means that this research has met one or more of the federal criteria for exemption per 45 CFR 46.104- Exempt Research.
- Before the research is initiated, permission to conduct research at a given site must be obtained from all research locations listed in the IRB submission. You must keep copies of all such permission letters for your files.
- It is the responsibility of each researcher to follow all applicable policies and procedures of any outside institution where the research will be conducted.

Modifications:
Any changes to this exempt project must be reviewed by the IRB prior to initiation by submitting a MODIFICATION request. Do not collect data while the changes are being reviewed. Data collected during this time cannot be used in research.

Record Retention:
Exempt projects will be retained by the IRB office for three years after the last action on the project.

You are approved to start the research. Please retain a copy of this notification for your records.

If you have any questions, please contact the IRB office.

Thank you.

The Oakland University IRB