11-24-2023

Adverse Childhood Experiences and Sports Participation Among Lesbian, Gay, and Bisexual Adolescents

Robert John O'Brien
Walden University

Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral study by

Robert O'Brien

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Patrick Dunn, Committee Chairperson, Public Health Faculty
Dr. Lee Caplan, Committee Member, Public Health Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2023

Abstract

Adverse Childhood Experiences and Sports Participation Among Lesbian, Gay, and Bisexual Adolescents

by

Robert J. O'Brien III

MHS, Drexel University, 2013

BA, University of Richmond, 2008

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

November 2023

Abstract

While the health benefits associated with sports participation are widely recognized, participation rates among sexual minority adolescents are lower than among their heterosexual peers. Adverse childhood experiences (ACEs), including bullying and sexual and physical violence, have been shown to negatively impact the health and well-being of sexual minority adolescents, but evidence is lacking regarding associations between ACEs and sports participation. This quantitative study was conducted to examine associations between ACEs and organized sports participation among lesbian, gay, and bisexual adolescents when adjusted for sex, race/ethnicity, and grade. A cross-sectional study design, informed by Rosenstock's health belief model, was used to investigate these associations, using data from the Centers for Disease Control and Prevention's 2019 Youth Risk Behavior Survey. Chi-square tests of independence identified statistically significant associations between organized sports participation and bully victimization ($p = 0.048$), sexual violence victimization ($p = 0.005$), and physical violence victimization ($p = 0.001$). A two-step hierarchical binomial logistic regression determined that individuals who reported a history of sexual violence victimization were 1.6 times more likely to participate in sports, and those who reported physical violence victimization were 1.5 times more likely to participate in organized sports. The implications for positive social change are that this study can serve as the framework for future research to explore associations between other forms of ACEs and organized sports participation, can foster cross-sector collaboration to develop safe spaces in sports, and can promote organized sports participation among sexual minority adolescents.

Adverse Childhood Experiences and Sports Participation Among Lesbian, Gay, and Bisexual Adolescents

by

Robert J. O'Brien III

MHS, Drexel University, 2013

BA, University of Richmond, 2008

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

November 2023

Acknowledgments

This paper is the product of 5 years of dedicated learning guided by several key contributors. First, I would like to thank Dr. Irana Hawkins for opening the doors to the challenging, but endlessly rewarding, field of public health. Your tutelage and guidance solidified my passions and set the foundations to persevere in the face of adversity. To Dr. Patrick Dunn, thank you for your stalwart mentorship as the chair of my doctoral committee. Your inspiring patience, support, and expertise were instrumental in shaping my academic and personal growth. To Dr. Lee Caplan, thank you for your meaningful contributions and feedback throughout the capstone writing process. And, finally, and most importantly, thank you, JJ. Your steadfast support, endless encouragement, and welcoming wisdom played a pivotal role in the completion of this circuitous journey, which, without you, would have ended right after it began.

Table of Contents

List of Tables

List of Figures

Section 1: Foundation of the Study and Literature Review

Introduction

Substance abuse and poor health outcomes pose significant public health issues for sexual minority adolescents. Sports participation has been one identified intervention that can help address substance abuse and improve long-term health outcomes (Easterlin et al., 2019; Malm et al., 2019). However, sports participation varies substantially, especially among marginalized populations, including sexual minority adolescents. While efforts have been made to promote sports participation among this vulnerable population, there continues to be a disparity compared to heterosexual peers (Wilson & Cariola, 2020). Moreover, there is a paucity of research examining what barriers exist to prevent sports participation. Further research is needed to help identify influential factors so that targeted interventions can be developed to help promote sports participation among sexual minority adolescents and address the myriad of adverse health outcomes.

Therefore, in this study, I examined the associations between adverse childhood experiences (ACEs), such as history of being bullied, history of sexual violence, history of physical violence, and sports participation among lesbian, gay, and bisexual (LGB) high school students. Section 1 provides the study background, problem statement, study purpose, research questions, and related hypotheses. Additionally, in this section, I discuss and operationalize the theoretical framework applied in this study, explore the nature of the study, review the literature search performed to review the current literature effectively, define key terms, identify relevant assumptions and limitations, and argue for the study's significance.

Background

Regular physical activity has been identified as a vital aspect of a healthy lifestyle and is associated with favorable long-term health outcomes. Likewise, the literature has demonstrated associations between mental and physical health benefits and sports participation (Malm et al., 2019). These associations include a lower prevalence of noncommunicable diseases, such as obesity, substance abuse, anxiety, and depression, especially among adolescents (Easterlin et al., 2019). Despite these documented benefits, the Centers for Disease Control and Prevention (CDC, 2022a) reported the prevalence of childhood and adolescent obesity as 19.7% among individuals 2–19 years of age in 2020. Additionally, the CDC (2022b) noted that 15% of high school students reported using illicit or injection drugs, while 14% reported misusing prescription opioid pain relievers. Lastly, Daly (2022) reported that since 2009, there has been a substantial and sustained increase in depression among adolescents in the United States. While efforts have been made to address these issues, there continues to be a sustained prevalence of poor health outcomes and increased health-risk behaviors, particularly among marginalized populations, including sexual minority adolescents (Easterlin et al., 2019).

The literature has demonstrated that sexual minority adolescents encounter considerable challenges during the formative years of adolescence (Wilson & Cariola, 2020). Due to increased social stigma, exclusion, and the challenges associated with navigating heteronormative education and social groups, these individuals are at an increased risk of developing substance use disorder, anxiety, depression, and suicidal ideation (Wilson & Cariola, 2020). For example, among the heterosexual respondents of

the CDC's 2019 Youth Risk Behavior Survey (YRBS; 2020a), 28.8% reported they currently drank alcohol, 13.4% reported current binge-drinking behaviors, 6.4% reported taking prescription pain medication without a doctor's note or differently than prescribed, and 12.7% reported having ever used select illicit drugs. Moreover, 32.2% reported feeling sad or hopeless almost every day for two or more weeks in a row, 14.5% seriously considered attempting suicide, 12.1% planned to commit suicide, and 6.4% attempted suicide. Conversely, among sexual minority respondents of the CDC's (2020a) 2019 YRBS, 33.9% reported current alcohol use, 15.6% reported current binge drinking behaviors, 12.0% reported prescription pain use without a doctor's note or differently than prescribed, and 27.8% reported having ever used select illicit drugs. Additionally, 66.3% reported feeling sad or hopeless almost every day for 2 weeks or more, 46.8% reported seriously considering attempting suicide, 40.2% planned to commit suicide, and 23.4% attempted suicide. These statistics coincide with the published literature that has reported significant differences between sexual minority and heterosexual adolescents (Wilson & Cariola, 2020).

Similarly, the literature has demonstrated considerable differences in the prevalence of peer and sexual violence among sexual minority adolescents (Doull et al., 2018; Greenspan et al., 2019). For example, in the 2019 YRBS, the CDC (2020a) reported that among heterosexual respondents, 6.3% reported having been threatened or injured with a weapon on school property, 21.4% were in a physical fight, 14.1% were electronically bullied, 17.1% were bullied on school property, and 7.5% did not go to school because they felt unsafe. Conversely, among sexual minority respondents, 11.9%

were threatened or injured with a weapon on school property, 23.9% were in a physical fight, 26.6% were electronically bullied, 32% were bullied on school property, and 13.5% did not go to school because they felt unsafe. Additionally, 21.5% of sexual minority respondents reported having experienced sexual violence, compared to 9.0% of heterosexual respondents.

While organized sports participation has been identified as an avenue to assuage these trends, participation rates among sexual minority adolescents continue to be lower than those of their heterosexual peers (Greenspan et al., 2019). In the literature, concerns of safety, exposure to violence and abuse, and vulnerability to harm have been identified as potential explanations for decreased participation, but further research is needed to explore how these identified factors impose barriers to participation (Flores Aguilar et al., 2020; Greenspan et al., 2019; Kokkonen, 2018; Kulick et al., 2018). Understanding the interplay between ACEs and sports participation among sexual minority adolescents is imperative to develop nuanced interventions to help increase participation and address the prevalent health risks behavior of this vulnerable population.

This study's research questions were used to analyze the associations between ACEs, including bullying, sexual violence, and physical violence, and organized sports participation among LGB adolescents. Unfortunately, there is a significant gap in the literature regarding whether these ACEs influence sports participation rates among sexual minority adolescents. Greenspan et al. (2019) reported that further research is needed to develop and effectively integrate school and community interventions to support sexual minority youth athletics. Moreover, these authors call for further research exploring and

identifying factors that may influence the substantial discrepancies in sports participation between sexual minority adolescents and their heterosexual peers.

The persistent gap in the literature regarding associations between ACEs and sports participation contributes to the suboptimal response to addressing the concerning rates of high-risk health behaviors among sexual minority adolescents. Continued research is necessary to appropriately identify factors influencing or inhibiting sports participation rates among sexual minority adolescents. This investigation may foster the development of more nuanced and culturally informed programming, including policy change and education implementation.

Problem Statement

High-risk health behaviors, peer violence, and sexual violence among sexual minority adolescents are significant public health issues. As previously noted, sexual minority adolescents report substantially higher rates of peer violence, sexual violence, substance abuse, and suicidality than their heterosexual peers (Eckstrand et al., 2019; Fix et al., 2021; Medina-Martinez et al., 2021). These detrimental factors, combined with the inherent difficulties associated with the formative years of adolescence, can result in lifelong poor health outcomes, which have been documented in the literature.

Sexual minority adolescents have an increased risk of developing a diverse spectrum of chronic poor health outcomes. Wilson and Cariola (2019) reported that sexual minority adolescents often face substantial challenges compared to heterosexual adolescents, as they progress through prevalent heteronormative institutions, such as schools, during their developmental years. As such, this vulnerable population is at an

increased risk of developing enduring mental health problems (Wilson & Cariola, 2019). Similarly, Amos et al. (2020) reported that sexual minority adolescents are more like to experience symptoms of depression, suicidal ideation or self-harm, lower self-esteem, and body dysmorphia compared to heterosexual adolescents. Lastly, Heslin and Hall (2021) reported that sexual minority persons have a higher prevalence of pulmonary pathologies, including asthma and COPD, cardiovascular disease, renal disease, and cancer, compared to heterosexual persons. As such, effective interventions to help decrease these trends are needed.

Youth sports participation has been cited as a reliable avenue to promote physical activity and is associated with a spectrum of favorable health outcomes, such as a lower prevalence of obesity, anxiety, substance abuse, and self-harm (Easterlin et al., 2019). However, sports participation rates among sexual minority adolescents vary greatly (Wilson & Cariola, 2020). While researchers have spent considerable time examining these rates, there is limited research into which factors influence sports participation among this vulnerable group. Kokkonen (2018) identified fear of harassment and physical violence as influences but called for further research to examine barriers. As such, the specific research problem addressed in this study is the associations between ACEs, including a history of being bullied, physical violence, and sexual violence, and sports participation among LGB adolescents.

Purpose of the Study

This quantitative cross-sectional study was conducted to investigate the associations between ACEs, including bullying, sexual violence, and physical violence,

and sports participation among LGB high school students, when controlling for sex, race/ethnicity, and grade. In this study, I sought to answer three research questions that examine the influence of several independent variables on the dependent variable organized sports participation. The independent variables for this study consisted of the history of bullying on school property (within the past 12 months), history of sexual violence, and history of physical fights (within the past 12 months). Sex, race/ethnicity, and grade were the control variables for this analysis.

Research Questions and Hypotheses

RQ1: Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$1: There is no statistically significant association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a1: There is a statistically significant association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

RQ2: Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$2: There is no statistically significant association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a2: There is a statistically significant association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

RQ3: Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$3: There is no statistically significant association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a3: There is a statistically significant association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

Theoretical Foundation

The theoretical framework employed for this quantitative study was Rosenstock's (1974) health belief model (HBM). First described to explain the underutilization of preventive services to address tuberculosis, the HBM has been widely used as a foundation for understanding and predicting various health behaviors (Green et al., 2020). The HBM provides a nuanced approach to understanding the relationship and interplay between perceptions and the external influences that promote or inhibit health behavior

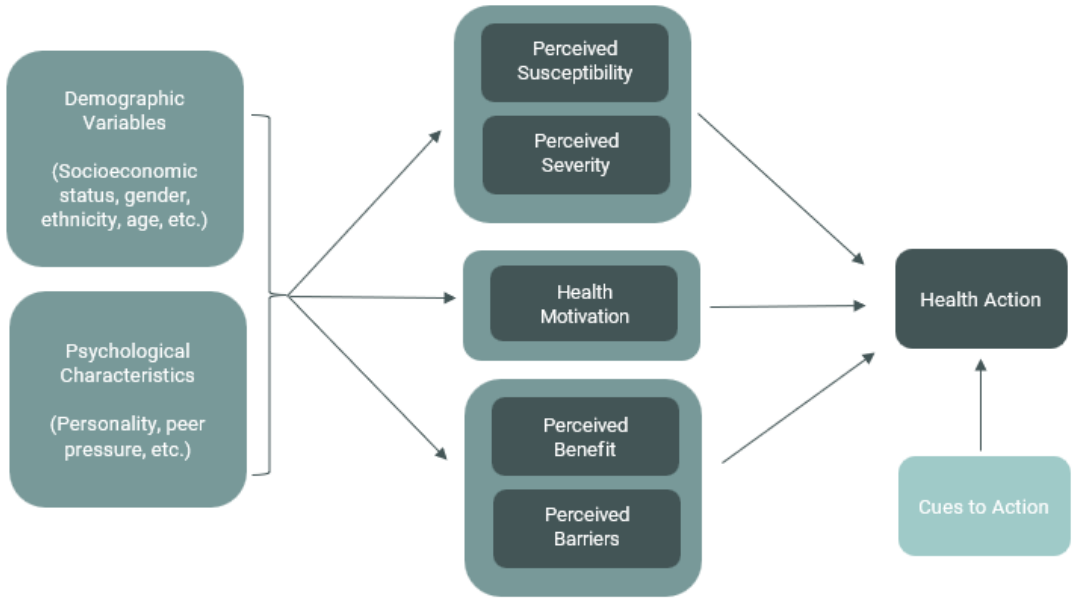
(Green et al., 2020; Hayden, 2019; Naqvi et al., 2022). Moreover, this model works to identify the modifiable factors that can be addressed through education and interventions (Hayden, 2019).

As seen in Figure 1, the HBM provides public health practitioners with a complex framework to develop, implement, and evaluate programming focused on improving health behavior. Green et al. (2020) noted that the HBM can be readily operationalized to better understand and promote healthy behaviors; however, the model requires that individuals are rational, wish to avoid illness, and must be well informed. The tenets of this model, which have been well studied and diversly applied, include the following:

- Perceived susceptibility: An individual's assessment or evaluation of the inherent risk of becoming ill or experiencing an unwanted outcome.
- Perceived severity: An individual's assessment or evaluation of the seriousness of the illness or unwanted outcome.
- Perceived barriers: An individual's assessment or evaluation of the influences that inhibit or discourage the integration of new behavior.
- Perceived benefits: An individual's assessment or evaluation of the positive outcomes of adopting a new behavior.
- Self-efficacy: An individual's confidence level in his/her inherent ability to perform a new behavior accurately.
- Cues to action: The internal and external stimuli required to initiate the integration of new behavior (Green et al., 2020).

Figure 1

Health Belief Model



Since its initial emergence, the HBM has been used to study and predict several health behaviors. For example, McArthur et al. (2018) employed the HBM to examine weight-related beliefs of college students and their predictive power on body mass index (BMI). The researchers employed a cross-sectional online survey to measure weight-related beliefs using multiple scales guided by the HBM constructs. The instruments focused on assessing students' perceived severity of the health consequences of obesity, their perceived susceptibility to developing obesity, their perceived barriers to adopting healthy eating and integrating regular physical activity, their perceived benefits of these behaviors, and the cues to action to adopt these behaviors (McArthur et al., 2018). The authors reported that the influence of perceived severity, susceptibility, barriers, benefits,

and external cues varied but predicted BMI. McArthur et al. (2018) concluded that the perceived benefit of physical activity was the strongest predictor of BMI, noting that this could be used as a predictive tool to help develop an informed intervention to address specific health concerns.

Gabriel et al. (2019) examined the role of the HBM to assess the attitudes and perceptions that influence overall participation in sports injury prevention programming among physically active adults. The researchers used several psychometric measures to help identify the perceived benefits and barriers to physical activity and injury prevention programming. The authors reported that self-efficacy was a strong predictor of physical activity, followed by benefits and barriers. Gabriel et al. concluded that the tenets of the HBM assist in performing exploratory analyses related to health behavior.

Sharp et al. (2019) examined substance use, bullying, and violence within a high school setting using the HBM as a framework. In addition, the authors performed a secondary data analysis that demonstrated that substance abuse perpetuates high-risk behavior and the perpetration of bullying (Sharp et al. 2019). The authors noted that these results highlight several constructs of the HBM. Specifically, individuals who demonstrate a conceptualization of high-risk perception are less likely to perform risky behaviors. In contrast, individuals with a low-risk perception are more likely to perform risky behaviors.

Saghafi-Asl et al. (2020) performed a similar cross-sectional study employing the HBM. The researchers used structured questionnaires to examine the factors influencing weight management and the predictive power of the HBM on BMI. The authors noted

that perceived susceptibility and severity of obesity, barriers to exercise, and self-efficacy of exercise were the strongest predictors of students' BMI. Moreover, the authors noted that perceived susceptibility and severity mediated the relationships between cues to actions, perceived benefits, and weight management practices. The authors concluded that preventive health interventions require the integration of educational programming based on theoretical foundations (Saghafi-Asl et al., 2020).

The research literature demonstrates that the HBM can be effectively utilized to better understand perceptions of physical activity, inform health behavior, and predict risk behavior. As such, the HBM was employed to inform this study's research questions and design. Organized sports participation, an avenue for physical activity, is limited among sexual minority adolescents. Moreover, this population is susceptible to several high-risk behaviors that are influenced by perceptions and self-efficacy. For example, perceived susceptibility and severity of chronic health outcomes secondary to limited physical activity have been associated with lower BMI (McArthur et al., 2018; Saghafi-Asl et al., 2020).

Additionally, perceived susceptibility and severity are associated with decreased risk behaviors (Sharp et al., 2019). Moreover, perceived benefit barriers and self-efficacy influence the adoption of regular physical exercise (Gabriel et al., 2019). As such, this theoretical framework was utilized to develop the research questions to examine the associations between ACEs and organized sports participation among sexual minority adolescents.

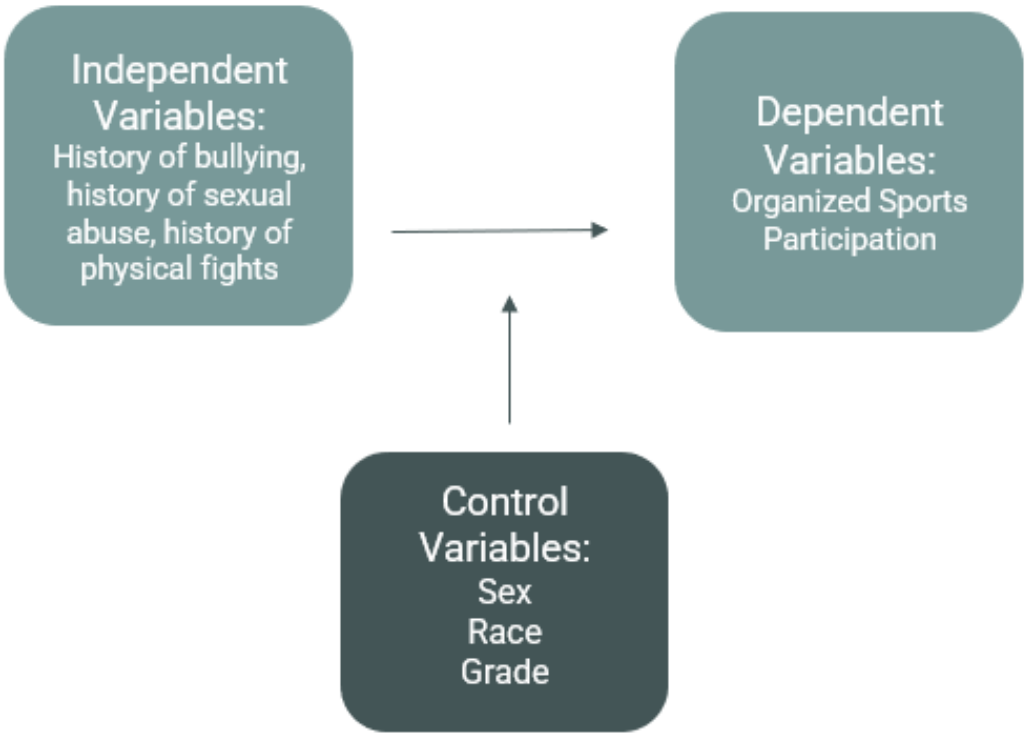
Nature of this Study

The research questions for this quantitative study examined whether associations exist between ACEs and sports participation among LGB adolescents. To best examine these associations, a cross-sectional study design was used to analyze secondary data from the CDC's YRBS 2019 data set. To perform this analysis, the ASCII file for the CDC's YRBS national data set was downloaded. This file was then converted and uploaded into an SPSS data set. This data set was used because it contains the pertinent information, as seen in Figure 2, to perform this analysis, including the following variables:

1. Independent variables: history of being bullied on school property (within the past 12 months), history of forced sexual intercourse, history of being in a physical fight (within the past 12 months)
2. Dependent variable: organized sports participation
3. Control variables: sex, race/ethnicity, grade

Figure 2

Study Variables



Literature Search Strategy

The Walden University library search engine and resources were used to search the MEDLINE and CINAHL databases to perform an exhaustive literature review. These databases were reviewed specifically for pertinent peer-reviewed articles published between 2018 and 2022. Several keywords were identified and used for this search, including *sexual minority adolescents, lesbian adolescents, gay adolescents, bisexual adolescents, organized sports participation, recreational sports participation, team sport participation, individual sport participation, prevalence, bullying, cyberbullying, sexual abuse, sexual dating violence, sexual violence, physical violence, high school violence,*

Health Belief Model, and *the United States*. Articles included in the subsequent literature review were published within the last 5 years. Any articles published before 2018 were identified as seminal works and integral to provide context to this information. To develop an in-depth literature review, snowballing was identified as the most efficient and effective technique to identify related and impactful articles.

Literature Review Related to Key Variables

Organized Sports Participation: Introduction and Definition

Regular physical activity has been identified as the cornerstone to healthy development and favorable long-term health outcomes. Moreover, introducing physical activity during the formative years of adolescence has been associated with lifelong physical activity (Guddal et al., 2019). The CDC (2020b) recommends that children and adolescents through 17 years perform 60 minutes of moderate-to-vigorous aerobic physical activity daily. Integrating adequate physical activity levels could prevent 10% of premature deaths, specifically preventing 1 in 15 cases of heart disease and 1 in 12 cases of diabetes (CDC, 2020b). The 2019 National Survey of Children's Health reported that only 55% of children ages 6–17 participated in physical activity after school or on weekends (Data Resource Center for Child & Adolescent Health [DRCCAH], 2023). Long-term adherence to these recommendations could address the $117 billion in annual healthcare expenditures associated with inadequate physical activity (CDC, 2020b).

One frequently cited avenue for regular physical activity is organized sports participation. The research literature has regularly demonstrated that sports participation is associated with a lower prevalence of noncommunicable diseases, such as

cardiovascular disease, endocrine pathologies, and obesity (Herbert et al., 2020). Additional secondary effects of sports participation include psychosocial development and a lower prevalence of substance abuse (Malm et al., 2019). These benefits of organized sports participation magnify its utility in addressing the growing prevalence of noncommunicable pathologies among youth and adolescent individuals. However, there is a difference between leisure physical activity and organized sports participation.

Definition

Interest in the effects of leisure physical activity and organized sports participation, particularly among adolescents, has grown precipitously over the past few decades. As previously noted, regular physical activity has been associated with several long-term health outcomes. The impact of these benefits can be stratified based on the level and structure of physical activity. As such, the research literature has defined organized sports participation as physical activity directed by youth leaders with associated rules, formal practices, and competitions (Logan et al., 2019; Wiium & Säfvenbom, 2019). The components of structured oversight, regular routines, and formal competitions distinguish organized sports participation from leisure physical activity. The Aspen Institute's Project Play initiative expands this definition to include adolescents who reported participating in sports lessons after school or on weekends (Project Play, 2023). Participation in organized sports has demonstrated increased lifelong physical activity and good subjective health in adulthood and aids in developing physical skills, functional movements, self-regulatory and generalized life skills (Logan et al., 2019).

Prevalence and Recent Trends

Interest in organized sports participation has continued to increase over the past decade. In 2019, the reported participation rates of adolescents ages 13–17 were between 55% and 69.1% (DRCCAH, 2023; Hyde et al., 2020; Project Play, 2023). Specifically, 61.5% of adolescents reported participating in team sports, while 47.5% reported participating in individual sports (Project Play, 2023). However, only 41.5% reported regular participation in their sport. The U.S. Department of Health and Human Services has highlighted the importance of organized sports participation, setting a long-term goal of 63.3% of U.S. students playing sports by 2030 (Project Play, 2023). Moreover, in 2019 the U.S. surgeon general released a nationwide call to increase access to organized sports for all U.S. children and adolescents to increase participation rates (Watson et al., 2020).

Despite efforts to increase access to organized sports, there has been limited movement in participation rates. In 2021, the number of adolescents who reported participating in a team sport decreased to 56.2%; however, those who participated in individual sports increased to 51.8% (Project Play, 2023). Those who reported regular participation in sports remained the same at 41.7% (Project Play, 2023). This stagnation in participation rates could be secondary to the downwind effects of the COVID-19 pandemic, which halted many physical activities and organized sports events (Watson et al., 2020). Moreover, surveys performed in fall 2021 demonstrated that 27.8% of adolescents reported losing interest in sports (Project Play, 2023). These numbers decreased slightly in 2022, with 27.1% reporting a loss of interest in sports (Project Play, 2023). When examining these trends, it is essential to stratify participation rates by

several variables. In addition, the research literature has demonstrated that sports participation varies greatly across several populations and is notably lower among marginalized people (Easterlin et al., 2019).

Organized Sports Participation and Sexual Orientation

Social determinants and demographic factors, such as sexual orientation, have been associated with organized sports participation rates. For example, Wilson et al. (2019) examined the rates of aerobic physical and muscle-strengthening activities among college students and reported no difference based on sexual orientation. However, the research literature has also reported that lesbian, gay, bisexual, transgender, and queer (LGBTQ) adolescents participate in organized sports organizations at lower rates than their heterosexual peers. For example, Clark et al. (2021) reported that only 19.2% of LGBTQ adolescents participated in interscholastic sports, compared to 40.2% of their heterosexual peers. Additionally, only 15.9% of LGBTQ adolescents participated in intramural sports, compared to 35.8% of heterosexual adolescents (Clark et al., 2021). Moreover, Menzel et al. (2019) reported that 20% of the respondents to the OUT-SPORT Survey 2018 refrained from participating in a sport of interest due to their sexual identity.

While efforts have been made to improve inclusivity in youth sports, Doull et al. (2018) reported that LGBTQ adolescents are less likely to participate in organized sports than their heterosexual peers. Additionally, Knoester and Allison (2021) said that 33% of the National Sports and Society Survey respondents perceived organized sports as unwelcoming to the LGBTQ community, with over 40% reporting unfavorable interactions while playing sports due to their sexual orientation (Knoester & Allison,

2021). Clark et al. (2021) reported that 43.7% of LGBTQ students responding to the 2019 National School Climate Survey avoided locker rooms, 40.2% avoided physical education or gym classes, and 25.1% avoided school athletic fields or facilities due to feeling unsafe. The disparity between LGBTQ adolescents and their heterosexual peers permeates and poses a significant public health concern.

Organized Sports Participation and Sex

Trends in organized sports continue to vary based on demographic factors, such as sex (Wiium & Säfvenbom, 2019). For example, Hyde et al. (2020) reported that 57.9% of male respondents ages 14–17 in the 2017–2018 National Survey of Children's Health reported participating in organized sports, compared to 51.9% of female respondents aged 14–17. Likewise, the Aspen Institute's Project Play Initiative (2023) reported that in 2012, 51.1% of male youth ages 13–17 reported playing organized sports regularly. However, the prevalence of sports participation among male respondents decreased in 2020 to 44.1%, rebounding to 45.4% in 2021 (Project Play, 2023). Additionally, in 2012, only 39% of female respondents reported participating in sports regularly. This number decreased to 37.0% in 2020, increasing slightly to 37.2% in 2021 (Project Play, 2023).

This disparity in organized sports participation is echoed in the National Federation of States High School Association's (NFHS) 2021–2022 High School Athletics Participation Survey. In 2021–2022, over 4,376,582 male high school students reported regular sports participation, compared to 3,241,472 female high school students. This number of sports participants among female adolescents decreased from 3,202,733 in 2018–2019; the last year data were collected (NFHS, 2022). Ensuring appropriate

access to organized sports for both male and female adolescents is integral to ensuring favorable adolescent health.

Organized Sports Participation and Race

Organized sports participation varies by race, with ethnic minorities less represented in adolescent sports (Easterlin et al., 2019; Wiim & Säfvenbom, 2019). For example, Hyde et al. (2020) reported that 58.9% of White respondents ages 14–17 in the 2017–2018 National Survey of Children's Health reported participating in organized sports, compared to 51.6% of Black, non-Hispanic respondents, 57.1% of Asian, non-Hispanic respondents, 49.3% of Hispanic respondents, and 52.6% of multiracial respondents. Similarly, the Aspen Institute's Project Play Initiative (2023) reported that in 2012, 44.1% of White adolescents ages 13–17 reported playing a sport regularly, compared to 43.5% in 2020 and 43.9% in 2021. In 2012, 50.6% of Black adolescents ages 13–17 reported playing a sport regularly, compared to 41.4% in 2020 and 42.4% in 2021. In 2012, 36.9% of Asian/Pacific Islanders reported playing a sport regularly, compared to 36.2% in 2020 and 36.7% in 2021. Lastly, in 2012, 44.4% of Hispanic adolescents ages 13–17 reported playing a sport regularly, compared to 40% in 2020 and 40.3% in 2021 (Project Play, 2023). These disparities similar to those regarding gender and sexual orientation indicate it is vital to ensure proper access to all races to promote adolescent health.

Organized Sports Participation and Grade Level

As seen with sexual orientation, sex, and race, organized sports participation varies by grade or age (Shull et al., 2020). For example, Wiim and Säfvenbom (2019)

reported that organized sports participation tends to decrease with age as adolescents progress through high school. Additionally, Guddal et al. (2019) reported that high school seniors participated in sports at lower rates than high school juniors. Specifically, 56.7% of high school male seniors and 49.9% of high school female seniors participated in sports, compared to 65.8% of high school male juniors and 64.7% of high school female juniors (Guddal et al., 2019). Several potential causes of the negative correlation between grade/age and organized sports participation include decreased interest, decreased parental support, and decreased available time due to work (Project Play, 2023; Wiim & Säfvenbom, 2019).

Adverse Childhood Experiences: Introduction, Definition, Risk Factors, Protective Factors

ACEs are a significant public health concern in the United States. The research literature has reported that ACEs are associated with chronic health conditions, anxiety, and substance use (CDC, 2022c). Moreover, ACEs may result in unseen and long-term adverse effects on education and occupations (CDC, 2022c). According to Merrick et al. (2019), nearly 16% of adults experienced ACEs associated with significant socioeconomic challenges, health risk behaviors, and poor health outcomes. Giano et al. (2020) reported that the prevalence of individuals who have experienced at least one ACE is closer to 57.8%. Therefore, reducing or preventing ACEs through early interventions and education is imperative. The CDC (2022c) reported that reducing ACEs by 10% would result in savings of over $56 billion yearly.

Definition

The research literature has established that ACEs include a spectrum of adverse and traumatic events during childhood and adolescence (CDC, 2022c; Felitti et al., 2019; Merrick et al., 2019). These events can include experiencing or witnessing violence, abuse, or neglect. Additionally, experiencing the loss of family members by suicide or attempted suicide and maturing in environments with substance abuse, mental health problems, and a high prevalence of incarceration can also be considered ACEs (CDC, 2022c). These events have been linked to multiple risk factors that can be leading causes of death in adults (Felitti et al., 2019).

Risk Factors

The CDC (2022c) has identified and published an extensive list of individual and family risk factors that can predispose children and adolescents to ACEs. These risk factors include: (a) families with young caregivers, (b) families with generational trauma secondary to prior abuse and neglect, (c) families with lower access to education and steady work, (d) families experience high levels of allostasis, including economic stress, and (e) families with inconsistent discipline approaches and limited supervision (CDC, 2022c). Additionally, these risk factors can expand beyond the nuclear family into community environments that predispose children and adolescents to ACEs. These community factors include: (a) communities with a high prevalence of violence and crime, (b) communities with a high prevalence of poverty, (c) communities with limited access to quality education, and (d) communities with limited access to economic opportunities and high unemployment rates (CDC, 2022c). These risk factors require

comprehensive public health efforts to provide adequate resources and programming to assuage their life-long effects.

Protective Factors

Conversely, the CDC (2022c) has also identified and published protective factors that can mitigate the prevalence of ACEs among children and adolescents. The individual and family protective factors include: (a) families with caregivers who have stable employment, (b) families with caregivers who have higher education, (c) families with caregivers that emphasize the importance of school, (d) families with caregivers who can engage in positive activities together, (e) families with caregivers who have the means to supply basic needs (CDC, 2022c). Similarly, several community protective factors can help decrease the prevalence of ACEs among children and adolescents. These community factors include the following: (a) communities with access to reliable and high-quality schooling, (b) communities with access to reliable and safe childcare, (c) communities with access to reliable, stable, and safe housing, (d) communities with access to high-quality and reliable medical and mental health services, (e) communities with access to safe after-school programming and activities, (f) communities with high levels of connectedness and community involvement, and (g) communities with zero tolerance for violence (CDC, 2022c). These protective factors can be bolstered and supported by developing and implementing comprehensive and supportive public health programming. As such, these modifiable characteristics demonstrate that many ACEs, including bullying, sexual violence, and physical violence, are preventable (CDC, 2022c).

Bullying: Introduction, Definition, Associated Health Outcomes

Bullying has long been considered an inherent component of adolescence. Moreover, this ubiquitous problem is often, and wrongly, considered a crucial phase of life (Kilicheva & Klicheva, 2020; Urbarksi, 2019). This form of youth violence can result in physical and mental injury, self-harm, emotional distress, and death (CDC, 2019). Moreover, the research literature has identified bullying as a risk factor for increased depression and anxiety and can negatively impact school performance (CDC, 2019). Bullying includes a spectrum of aggression and can take many forms throughout an adolescent's life.

Definition

Victimization secondary to bullying can present in several different ways. However, all of these have a core set of patterns defining bullying. First, bullying establishes a power imbalance between an aggressor and a victim (Urbarksi, 2019). This form of violence is specific to groups of children or adolescents who are not related or currently dating (CDC, 2019). This observed or perceived power dynamic is often recurring and worsens with time. Second, victimization results from physical or verbal aggressions (CDC, 2019). Third, with the advent of the internet and social media, bullying has progressed from in-person to online cyberbullying (Chun et al., 2020). Unfortunately, bullying can often be a silent phenomenon, as not all bullied children demonstrate visible warning signs.

Associated Health Outcomes

The effects of bullying manifest acutely and can propagate well into adulthood. The research literature has identified several associations between poor health outcomes and being bullied. For example, Armitage (2021) reported that there is a dose-response relationship between the frequency and intensity of bullying that can result in substantial adverse mental health outcomes and physical trauma. Additionally, Kilicheva and Klicheva (2020) reported that both victims and perpetrators of bullying are more likely to develop social problems, aggression, anxiety, and substance abuse. Moreover, these individuals are more likely to engage in high-risk health behaviors and demonstrate difficulties in emotional well-being as adults (Camodeca & Nava, 2020; Kilicheva & Klicheva, 2020; Urbanski, 2019). Lastly, Cuesta et al. (2021) reported that being a victim of bullying was associated with an increased risk of suicide. As such, bullying is associated with substantial morbidity, particularly during the formative years of childhood and adolescence.

Prevalence and Recent Trends

Despite a multimodal public health response, bullying continues to be a widespread issue throughout the US. For example, according to the CDC (2021a), 20% of high school students reported a history of bullying within the past year. Moreover, nearly 15% of students at public schools reported being a victim of bullying at least once a week (CDC, 2021a). Additionally, Lebrun-Harris et al. (2020) noted that the prevalence of bullying victimization varies significantly by state and can exceed 35.9% of adolescents.

Similarly, cyberbullying remains a substantial public health concern; however, this often-unseen form of aggression is frequently understudied. For example, Patchin and Hinduja (2021) reported that cyberbullying could have detrimental effects due to the online nature of this form of victimization. Specifically, more individuals may be exposed to online mistreatment and be negatively impacted over time. For example, nearly one in five adolescents reported exposure to cyberbullying as a witness or a target. In addition, bullying victimization is magnified among vulnerable and marginalized populations. For example, Nagata et al. (2022) reported that while the lifetime prevalence of cyberbullying victimization is only 9.6%, several demographic factors can amplify the risk of victimization, including sexual orientation, sex, race, and age.

Bullying and Sexual Orientation

Sexual minority adolescents, including LGB individuals, are substantially affected by bullying. For example, Stogner et al. (2021) reported that LGB adolescents experience bullying significantly more than their heterosexual peers. Additionally, Angoff and Barnhart (2021) said that recent prevalence statistics highlighted this disparity, noting that 35% of LGB adolescents reported in-school bullying compared to 19% of heterosexual adolescents. Similarly, Goldbach et al. (2017) reported that 59.4% of LGB adolescents reported verbal victimization, 70.3% reported relational victimization, and 55.9% reported physical victimization. Conversely, 46.2% of heterosexual adolescents reported verbal victimization, 53.2% reported relational victimization, and 42.9% reported physical victimization (Goldbach et al., 2017). Furthermore, LGB adolescents are disproportionately bullied online relative to their heterosexual peers (Angoff &

Barnhart, 2021). Angoff and Barnhart (2021) reported that bisexual adolescents were the most victimized groups, particularly with cyberbullying, when stratified by sexual orientation.

Research has increasingly highlighted the trends of bullying victimization by sexual orientation over time. The CDC (2021a) reports that despite increased efforts to address bullying, the prevalence has remained steady over the past several years. For example, in 2015, 18.8% of heterosexual adolescents reported being bullied at school, compared to 34.2% of LGB adolescents (CDC, 2021a). In 2017, 17.1% of heterosexuals reported being bullied, compared to 33% of LGB adolescents. In 2019, there was little movement in the prevalence of bullying, with a continued 17.1% of heterosexual and 32% of LGB adolescents reporting bully victimization at school. There has also been some downward movement in cyberbullying over the past several years, but these rates do not favorably reflect the widespread concerted efforts to curtail this issue. For example, the CDC (2021a) reported that in 2015, the rate of cyberbullying victimization among heterosexual adolescents was 14.2%, compared to 28% of LGB adolescents. In 2017, the rates slightly decreased, with 13.3% of heterosexuals and 27.1% of LGB adolescents reporting cyberbullying victimization. Lastly, in 2019, these numbers mainly remained stagnant, with 14.1% of heterosexual and 26.6% of LGB adolescents reporting cyberbullying victimization (CDC, 2021a).

Bullying and Sex

The research literature has also demonstrated disparities in bullying victimization related to sex. For example, Webb et al. (2021) reported that females were more likely to

report bullying victimization than males. Moreover, Halliday et al. (2021) said that not only are females more likely to experience bullying, but the psychosocial and adverse academic outcomes are also more pronounced compared to males. Angoff and Barnhart (2021) reported several statistics highlighting the differences in bullying victimization by sex. The authors also identified that female adolescents had significantly higher odds of bullying victimization than male adolescents. Similarly, Kreski et al. (2022) reported that 23.6% of female adolescents reported bullying victimization compared to 15.4% of male adolescents. When examining the prevalence of cyberbullying, nearly twice as many female students, 20.4%, have reported cyberbullying victimization relative to male students, 10.9% (CDC, 2021a).

When stratifying by sex, there are concerning trends over time demonstrating that the disparity is worsening, specifically with school-based bullying. For example, the CDC (2021a) reported that in 2009, 18.7% of males and 21.2% of females said they were bullied at school. However, in 2019, the prevalence of bullying victimization in males decreased to 15.4%, while it increased in females to 23.6% (CDC, 2021a). In addition, cyberbullying among males remained stagnant in 2019, with 10.9% reporting they were electronically bullied. Fortunately, the prevalence decreased in females, with 20.4% reporting cyberbullying in 2019 (CDC, 2019).

Bullying and Race

The research literature has demonstrated that the prevalence of bullying victimization varies across racial and ethnic groups. For example, Kreski et al. (2022) noted that reported bullying victimization varied substantially when stratified by race and

ethnicity. Specifically, non-Hispanic multiracial students were most likely to experience bullying victimization, followed by American Indian/ Alaskan Natives, White, Hispanic, Asian/ Pacific Islander, and Black students (Kreski et al., 2022). Angoff and Barnhart (2021) reported similar findings, reporting that Hispanic and Black students had lower odds of experiencing in-school bullying than white students. These trends were similar when examining the prevalence of cyberbullying, which demonstrated lower odds among Hispanic, Black, and mixed-race students than White students (Angoff & Barnhart, 2021). Finally, the CDC (2021a) reported that 23.1% of White students reported in-school bullying, compared to 15.1% of Black and 14.8% of Hispanic students. Similarly, 18.6% of White students were electronically bullied, compared to 8.6% of Black and 12.7% of Hispanic students (CDC, 2021a).

When examining trends over time, there are several differences when stratified by race and ethnicity. For example, in 2009, 21.6% of White students reported being bullied at school. However, in 2019, 23.1% of White students reported in-school bullying victimization. Conversely, in 2009, 18.5% of Hispanic students reported being bullied at school. In 2019, the prevalence of in-school bully victimization decreased to 14.8%. Lastly, in 2009, 13.7% of Black students reported in-school bully victimization. Unfortunately, this number increased to 15.1% in 2019 (CDC, 2021a). There was minimal improvement in the prevalence among racial groups regarding cyberbullying victimization. Specifically, 18.6% of White students reported being electronically bullied in 2009 and 2019. Similarly, 8.9% of Black and 13.6% of Hispanic students said they

were electronically bullied in 2009, compared to 8.6% and 12.7%, respectively in 2019 (CDC, 2021a).

Bullying and Grade Level

As the research on bullying victimization continues, the prevalence varies based on school grade. For example, Webb et al. (2021) reported that school grades were significantly associated with the prevalence of electronic bullying. Similarly, Angoff and Barnhart (2021) said there was a negative correlation between grades and bullying victimization. Specifically, the authors noted that the odds of reporting or being in-school bullied decreased for each grade level increase. Similarly, this relationship persists with cyberbullying, reducing with age and advancing through school (Angoff & Barnhart, 2021).

Adolescent Sexual Violence: Introduction, Definition, Associated Health Outcomes

Adolescent sexual violence is a prominent and substantial public health issue. Unfortunately, this problem is often underreported, as many survivors delay or refrain from reporting abuse. Moreover, the repercussions associated with childhood sexual violence manifest throughout an individual's lifetime (Hailes et al., 2019). These sequelae, including a spectrum of psychosocial and poor health outcomes, can result in substantial disability, poor academic performance, increased allostasis, and lower economic stability (Hailes et al., 2019; Misiak et al., 2022). The associated lifetime financial burden has been estimated to exceed $9.3 billion in the US (CDC, 2022d).

Definition

Adolescent sexual violence has been vastly studied, yet the definitions presented in the research literature substantially vary. The variability is secondary to the inherent complexity of this public health issue. For example, Mathews and Collin-Vézina (2019) reported that defining this issue is difficult due to several contexts, including moral and legal frameworks, policy responses, and social norms. However, a foundational group of concepts encompasses adolescent sexual violence. The CDC (2022d) identified that adolescent sexual violence involves a child less than 18 years of age and sexual activity that contravenes societal norms or laws. Additionally, adolescent sexual violence occurs when an individual does not or is unable to consent or is not developmentally prepared to fully comprehend (CDC, 2022d).

Associated Health Outcomes

The long-term health outcomes associated with adolescent sexual violence have been well documented in the research literature and pose a significant public health concern. The effects of this abuse can alter cognitive and behavioral development and function well into adulthood (CDC, 2022d). Moreover, these effects can result in both acute- and long-term physical and psychopathologic sequelae. For example, Strathearn et al. (2020) reported that sexual violence was associated with early sexual debut, increased risk of youth pregnancy, post-traumatic stress disorder, attention deficits, and depression. Gerwirtz-Meydan (2020) also noted that sexually abused adolescents demonstrated lower self-esteem and increased intrusive feelings of shame.

Moreover, this vulnerable population also reported self-blame, worthlessness, and feelings that they deserved abuse (Gerwitz-Meydan, 2020). Furthermore, Baiden et al. (2020) reported a significant association between experiencing sexual violence and increased suicidality. Lastly, Noll (2021) identified associations between adolescent sexual violence and increased risk of substance use disorders, sexual revictimization, sexual dysfunction, and psychiatric disorders. The deleterious and noxious effects of adolescent sexual violence instrumentally alter an individual's life trajectory and require substantial rehabilitation (Manheim et al., 2019).

Prevalence and Current Trends

Adolescent sexual violence is a prevalent public health concern in the US. Unfortunately, the true prevalence of abuse is difficult to truly appreciate, as many victims wait or refrain from reporting due to fear, shame, and familial pressure (CDC, 2022d). Gerwitz-Meydan and Finkelhor (2019) said that 66.3% of victims do not report abuse for these reasons. Moreover, as previously noted, the variation in legal definitions impedes the ability to deeply appreciate the overall prevalence of abuse (Mathews & Collin-Vézina, 2019). The CDC (2022d) estimates that 25% of females and 8% of males experience child and adolescent sexual violence. Despite concerted efforts to help address this issue, the CDC (2021a) reported that the prevalence of adolescents who experience sexual violence persists. Specifically, in 2009, 7.4% of adolescents said they experienced forced intercourse in their lifetime, compared to 7.3% in 2019 (CDC, 2021a). Additionally, in 2009, 10.4% of adolescents reported they experienced sexual dating violence, compared to 8.2% in 2019. While programming and educational interventions

have started to address this public health issue, the prevalence persists and is heightened when stratifying by demographic factors.

Adolescent Sexual Violence and Sexual Orientation

The research literature has demonstrated an association between adolescent sexual violence and sexual orientation. For example, Schwab-Reese et al. (2018) reported that LGB youth are at increased risk of sexual violence and abuse victimization. Specifically, this vulnerable population is at a 1.76 times increased risk of experiencing one type of sexual victimization and a 0.90 times increased risk of experiencing multiple types of sexual victimization (Schwab-Rees et al., 2018). Kammer-Kerwick et al. (2019) echoed these sentiments reporting that LGB adolescents and college students were more likely to experience an increased number of sexually violent acts compared to their heterosexual peers. Specifically, these individuals are at a 2.6 times increased risk of experiencing sexual violence (Kammer-Kerwick et al., 2019). Lastly, Scheer et al. (2019) also reported that bisexual adolescents were more exposed to sexual violence and abuse relative to their heterosexual peers.

Despite increased efforts to address this public health issue, the prevalence persists, with a notable disparity when stratifying by sexual orientation. For example, the CDC (2021a) reported that 19.4% of LGB adolescents said they experienced forced sexual intercourse, compared to 5.5% of heterosexual adolescents. Additionally, 16.4% of LGB adolescents reported sexual dating violence, compared to 6.7% of heterosexual adolescents.

When examining these trends over time, little improvement has been noted. Specifically, forced sexual intercourse has remained consistent among both heterosexual and LGB adolescents. The CDC (2021a) reported that in 2015, 5.4% of heterosexual adolescents experienced forced sexual intercourse, compared to 5.4% in 2017 and 5.5% in 2019. Similarly, in 2015, 17.8% of LGB adolescents experienced forced sexual intercourse, compared to 21.9% in 2017 and 19.4% in 2019 (CDC, 2021a). When examining sexual violence, there has been a notable decrease over time for both heterosexual and LGB adolescents. Specifically, in 2015, 9.1% of heterosexual adolescents reported sexual violence, compared to 5.5% in 2017 and 6.7% in 2019. Similarly, 22.7% of LGB adolescents reported sexual violence in 2015, compared to 15.8% in 2017 and 16.4% in 2019 (CDC, 2021a).

Adolescent Sexual Violence and Sex

A litany of data has identified a disparity in adolescent sexual violence trends when stratifying by sex. For example, Kammer-Kerwick et al. (2019) reported that female students are three times more likely to experience sexual violence when compared to their male peers. In addition, Basile et al. (2020) noted that female college students had higher odds of sexual victimization than male college students. Baiden et al. (2020) also indicated that 15.5% of female students experienced sexual violence, compared to 3.6% of male students. Additionally, Runarsdottir et al. (2019) reported that 16-20% of female adolescents reported a history of sexual violence, compared to 7-9% of males. Lastly, Taylor and Xia (2020) noted that while male students were more likely to be victimized

by physical abuse, female students were significantly more likely to be victimized by sexual violence.

When examining trends over time, there are continued disparities when stratifying by sex. Unfortunately, while increased attention and efforts have been placed to address this issue, many statistics remain the same. Additionally, female students continue to experience more sexual dating violence and abuse than male students (CDC, 2021a). For example, the CDC (2021a) reported that in 2009, 10.5% of female adolescents reported a history of forced intercourse, compared to 11.4% in 2019. Similarly, in 2009, 4.5% of male adolescents reported a history of forced intercourse, compared to 3.4% in 2019. However, there have been improvements in sexual dating violence. For example, the CDC (2021a) reported that in 2013, 14.4% of female students reported a history of sexual dating violence, compared to 12.6% in 2019. Similarly, in 2013, 6.2% of male students reported a history of sexual dating violence, compared to 3.8% in 2019 (CDC, 2021a).

Adolescent Sexual Violence and Race

The research literature has demonstrated that sexual violence affects children across racial and ethnic groups. For example, when examining sexual dating violence, Basile et al. (2020) reported that 8.1% of White students, 6.2% of Black students, and 8.7% of Hispanic students reported a history of experiencing sexual dating violence. Additionally, when examining general histories of sexual violence, 10.2% of White students, 10.3% of Black students, and 12.2% of Hispanic students reported a history of sexual violence (Basile et al., 2020). Finally, when examining the prevalence of sexual

victimization among college students, Basile et al. (2020) concluded that Black and mixed-race students had higher odds of victimization than White students.

When examining these trends over time, there have been improvements among certain racial and ethnic groups. For example, the CDC (2021a) reported that in 2009, 10% of Black students reported a history of forced sexual intercourse, decreasing to 7.2% in 2019. In 2009, 8.4% of Hispanic students reported a history of forced sexual intercourse, decreasing minimally to 8% in 2019. Conversely, there has been an increase among White students, with 6.3% reporting a history of forced sexual intercourse in 2009 and 7.1% in 2019 (CDC, 2021a). There has been an overall decrease in sexual dating violence among White, Black, and Hispanic students. Specifically, in 2013, 9.8% of White students reported a history of sexual dating violence, compared to 8.1% in 2019. Similarly, in 2013, 8.9% of Black students reported a history of sexual dating violence, compared to 6.2% in 2019. Lastly, 11.5% of Hispanic students reported a history of sexual dating violence in 2013, compared to 8.7% in 2019 (CDC, 2021a).

Adolescent Sexual Violence and Grade Level

While substantial work has been performed to examine the prevalence of adolescent sexual violence among various demographic groups, there is a paucity of data examining differences by grade. Some research has demonstrated a positive correlation between age and the risk of sexual violence. For example, Kammer-Kerwick et al. (2019) reported that the risk of sexual violence victimization increases over time as students advance through school. Runarsdottir et al. (2019) reported that 15% of 10th graders reported a history of sexual violence in a cross-sectional study; however, the authors did

not stratify by other school grades. The CDC (2021a) reported that 9.1% of 9th-grade students, 9.8% of 10th-grade students, 10.1% of 11th-grade students, and 9.6% of 12th-grade students reported a history of sexual violence. Similarly, 5.4% of 9th-grade students, 7.4% of 10th-grade students, 7.5% of 11th grade-students, and 9.4% of 12th-grade students reported a history of forced sexual intercourse (CDC, 2021a). These trends demonstrate that the risk of sexual violence increases as students mature.

Adolescent Physical Violence: Introduction, Definition, Associated Health Outcomes

Physical violence is a preventable cause of substantial morbidity during adolescence. Physical violence has been shown to impact lifetime job and academic opportunities negatively, result in significantly poorer physical and mental health outcomes, and decrease life expectancy (CDC, 2021b). For example, Steiner et al. (2019) reported that adolescent physical violence victimization is associated with increased health risk behaviors that extend well into adulthood. Additionally, the World Health Organization (WHO) (2020) reported that physical assault leading to homicide is the fourth leading cause of death in individuals aged 1-29. Non-fatal physical violence results in substantial healthcare utilization, including emergency room visits, and requires significant rehabilitation. Physical violence is also a leading cause of lost time in school. The CDC (2021a) reported that more students had missed school because of safety concerns related to physical violence over the past decade. Várnai et al. (2020) reported that adolescents involved in physical violence are more likely to experience poorer peer relationships and lower life satisfaction. Physical violence is a significant public health issue that requires comprehensive and efficient public health programming.

Definition

Physical violence can encompass a spectrum of maltreatment. For example, Elghossian et al. (2019) reported that physical violence could include violent discipline from parents, peer violence, and physical dating violence. In addition, Várnai et al. (2020) reported that physical violence often includes physical fighting, which can result in significant physical and emotional harm. This physical fighting can consist of spitting, kicking, punching, pushing, and damage to property (Xu et al., 2020). Moreover, physical violence generally involves a power imbalance between the perpetrator and the victim (Várnai et al., 2021). Lastly, Siller et al. (2020) highlighted that physical violence involves transferring physical force to inflict harm.

Associated Health Outcomes

Several deleterious health outcomes have been associated with physical violence victimization. Moreover, the effects of physical violence victimization can manifest in the short-term and later in life (Steiner et al., 2019; Várnai et al., 2020; World Health Organization [WHO], 2020). For example, peer physical violence victimization and fighting have been associated with an increased risk of substantial substance use and abuse, future victimization, and behavior problems (Várnai et al., 2020). Moreover, the CDC (2021b) reported that adolescent peer physical violence could increase the chance of heart disease, cancer, and health risk behaviors well into adulthood. In addition, Rahmna et al. (2020) reported that peer physical violence victimization was associated with increased suicidality, sleep disturbances, tobacco and alcohol use, and psychopathology.

Prevalence and Recent Trends

Physical violence is a significant public health issue, resulting in substantial morbidity and life-long sequelae. Despite widespread recognition of the noxious outcomes associated with physical violence, it is prevalent throughout the US (Várnai et al., 2020). For example, the CDC (2021a) reported that an estimated 7% of adolescent students reported that they were threatened or injured with a weapon while at school. Moreover, nearly 9% of students reported that they did not go to school at least once due to safety concerns related to physical violence victimization (CDC, 2021a). Lastly, 8.2% of adolescent students reported they experienced physical dating violence (CDC, 2021a).

Several trends continue to remain concerning when examining the prevalence of physical violence over time, despite considerable programming and available interventions. For example, in 2009, 7.7% of adolescent students reported being threatened or injured with a weapon while at school (CDC, 2021a). At the same time, this number decreased for several years, increasing to 7.4% in 2019. Similarly, in 2009 5% of adolescent students reported that they did not go to school due to safety concerns, rising to 8.7% in 2019. Conversely, there have been improvements in reported physical dating violence over the past decade. The CDC (2021a) reported that in 2013, 10.3% of adolescent students reported a history of physical dating violence, decreasing to 8.2% in 2019. When stratifying by demographic factors, the prevalence of physical violence varies greater and disproportionately affects specific populations.

Physical Violence and Sexual Orientation

The research literature has demonstrated that LGB adolescents are more likely to experience physical violence victimization than their heterosexual peers. For example, Johns et al. (2020) reported that LGB students had a 1.98 times increased risk of feeling unsafe at school secondary to physical violence victimization. Additionally, LGB students had a 2.09 times increased risk of being threatened or injured with a weapon at school (Johns et al., 2020). Furthermore, the CDC (2021a) reported that in 2019, 13.5% of LGB students did not attend school due to fear of violence, compared to 7.5% of heterosexual students. Moreover, 11.9% of LGB students reported being threatened or injured with a weapon at school, compared to 6.3% of heterosexual students (CDC, 2021a). Lastly, Basile et al. (2020) reported that LGB adolescents are disproportionately affected by interpersonal physical violence compared to heterosexual adolescents.

When examining trends over time, the prevalence of physical violence varies by sexual orientation. For example, in 2015, 5.1% of heterosexual students reported they were victimized or threatened with a weapon while at school, compared to 6.3% in 2019 (CDC, 2021a). Conversely, in 2015 10.0% of LGB students reported they were victimized or threatened with a weapon while at school, compared to 11.9% in 2019 (CDC, 2021a). In addition, in 2015, 4.6% of students did not go to school at least once due to fear of violence, increasing to 7.5% in 2019. The prevalence also increased among LGB students, with 12.5% in 2015 and 13.5% in 2019 reporting truancy secondary to fear of violence (CDC, 2021a). Lastly, the prevalence of physical dating violence has decreased among heterosexual and LGB students over the past several years.

Specifically, 8.3% of heterosexual and 17.5% of LGB students experienced physical dating violence in 2015, compared to 7.2% of heterosexual and 13.1% of LGB students in 2019 (CDC, 2021a).

Physical Violence and Sex

Similarly, the research literature has demonstrated that physical violence disproportionately varies based on sex. For example, Taylor and Xia (2020) reported that while females were more likely to be victimized by sexual violence, men were significantly more likely to experience physical victimization. The CDC (2021a) echoed this sentiment reporting that 8% of males said that they were threatened or injured with a weapon while at school, compared to 6.5% of female students. Moreover, 30% of male students reported a history of physically fighting, compared to 17.2% of females (CDC, 2021a). However, female students were more likely to experience physical dating violence than male students (CDC, 2021a; Taylor & Xia, 2020). Additionally, female students missed school more because of safety concerns than males (CDC, 2021a).

When examining the trends over time, there is sex-specific rates. For example, in 2009, 5.3% of female students reported truancy related to safety concerns, increasing to 9.8% in 2019. Similarly, 4.6% of male students said they missed school due to safety concerns, rising to 7.5% in 2019. Additionally, in 2009, 5.5% of female students reported being threatened or injured with a weapon while at school, increasing to 6.5% in 2019. Conversely, 9.6% of male students reported being threatened or injured with a weapon in 2009, decreasing to 8.0% in 2019 (CDC, 2021a). Additionally, physical dating violence decreased when stratifying by sex. Specifically, in 2013, 13% of female students

experienced physical dating violence, falling to 9.3% in 2019. Similarly, 7.4% of male students reported physical dating violence, decreasing to 7% in 2019 (CDC, 2021a).

Physical Violence and Race

The research literature has demonstrated variations in prevalence rates of physical violence when stratifying by race and ethnicity. For example, Xu et al. (2020) reported that racial and ethnic minority adolescents are frequently and disproportionately affected by physical violence inflicted by their peers. Moreover, racial and ethnic minorities are at substantially higher risk of poor health outcomes secondary to bias-based physical violence (Vitoroulis & Vaillancourt, 2018; Xu et al., 2020). Additionally, 73.6% of students experienced bullying, including physical violence, due to their race, ethnicity, or national origin (Galán et al., 2021). The CDC (2021a) reported that 8.8% of Black, 7.1% of White, and 6.9% of Hispanic students were threatened or injured with a weapon at school. Additionally, truancy rates, secondary to fear of violence, were 11.5%, 10.9%, and 6.7% among Black, Hispanic, and White students. Lastly, 8.9% of Hispanic, 8.2% of Black, and 7.5% of White students experienced physical dating violence (CDC, 2021a).

When examining the trends over time, there is persistent variation when stratifying by race and ethnicity. For example, in 2009, 6.4% of White students were threatened or injured with a weapon, increasing to 7.1% in 2019. Conversely, 9.4% of Black and 9.1% of Hispanic students reported they were threatened or injured with a weapon in 2009, decreasing to 8.8% and 6.9%, respectively in 2019 (CDC, 2021a). Similarly, physical dating violence decreased across racial and ethnic groups over time. Specifically, 10.4% of Hispanic, 10.3% of Black, and 9.7% of White students

experienced physical dating violence in 2013. This number decreased in 2019 to 8.9% of Hispanic, 8.2% of Black, and 7.5% of White students reporting a history of physical dating violence (CDC, 2021a).

Unfortunately, truancy, secondary to fear, increased across racial and ethnic groups over time. For example, in 2009, 8.1% of Hispanic, 6.3% of Black, and 3.5% of White students reported they missed school due to safety concerns. This increased in 2019 to 10.9% of Hispanics, 11.5% of Black, and 6.7% of White students reporting they missed school due to safety concerns (CDC, 2021a).

Physical Violence and Grade Level

Physical violence is frequently cited as a byproduct of misdirected aggression and emotional dysfunction. However, the research literature has demonstrated that the prevalence of physical violence generally decreases with age due to increased emotional intelligence as students mature (Mendez et al., 2019). For example, the National Center for Education Statistics (NCES) (2022) reported that the prevalence of fighting decreased as students progressed through high school. Specifically, in 2019, 25.8% of 9th-grade, 23.3% of 10th-grade, 20% of 11th-grade, and 17.6% of 12th-grade students reported having been in a physical altercation within the past 12 months (National Center for Education Statistics, 2022).

The CDC (2021a) also echoed these sentiments and reported that several variables decrease as students mature through high school. Specifically, 7.6% of 9th-grade, 7.9% of 10th-grade, 5.4% of 11th-grade, and 5.2% of 12th-grade students reported they missed school secondary to safety concerns. Additionally, 6.8% of 9th-grade, 6.8% of 10th-grade,

5.1% of 11th-grade, and 4.2% of 12th-grade students experienced harm or were threatened with a weapon (CDC, 2021a). However, physical dating violence fluctuated by grade, with 7.0% of 9th-grade, 8.4% of 10th-grade, 6.8% of 11th-grade, and 9.2% of 12th-grade students reporting victimization.

Assumptions

This cross-sectional study was completed without substantial ontological, epistemological, axiological, methodological, or rhetorical assumptions due to the database selected for this analysis. The CDC's YRBS national data set is a frequently used measure of youth health and risk behavior (Charles et al., 2022). The biannual and national approach to this school-based survey lends to its ability to be a substantially reliable and appropriate measure of youth health (Charles et al., 2022). Moreover, Underwood et al. (2020) reported that the YRBS can be accurately used without significant assumptions due to the sampling techniques which facilitate an accurate representation of adolescent students in high school in the US.

Scope and Delimitations

This cross-sectional study is designed to identify associations between ACEs and sports participation among LGB respondents to the CDC's 2019 YRBS. A secondary data analysis was performed to examine the prevalence of ACEs among LGB adolescents in the US. Moreover, this analysis also investigated the prevalence of organized sports participation, a frequently used intervention to decrease risk behavior, within this population. Finally, this analysis has the potential to help inform new public health

initiatives to promote organized sports participation to address the concerning health risk behavior trends in this vulnerable population.

To mitigate internal validity concerns, several methodologies were implemented by the CDC to address selection bias, an inherent threat in cross-sectional studies. For example, Underwood et al. (2020) reported that data was collected via a carefully designed survey comprised of nearly 100 questions that assessed multiple aspects of adolescent health. Additionally, participation was anonymous, voluntary, and at a single time point, preventing concerns of maturation and testing bias (Underwood et al., 2020). Lastly, to address concerns of non-respondent bias, the CDC employed weighting based on several demographic factors to appropriately represent the US adolescent high school population (Underwood et al., 2020). External validity, specifically population validity, was ensured through the widespread administration of this survey, which included 13,872 respondents. The authors excluded 195 respondents which did not complete the survey (Underwood et al., 2020).

To complete this secondary data analysis, specific variables were selected from the CDC's 2019 YRBS. The variables include a history of being bullied on school property within the past 12 months, a history of sexual violence (represented by forced sexual intercourse in their lifetime), a history of physical violence (represented by a physical fight) within the past 12 months, and sports participation (represented by participation in organized sports) within the past 12 months. The study results were limited to the selected study population and were not applicable, transferable, or generalizable to broader populations.

Limitations

There are several inherent limitations of this proposed study analyzing the associations between ACEs and organized sports participation among LGB respondents to the CDC's 2019 YRBS. The primary limitation is the usage of secondary data to perform this analysis. For example, Trinh (2018) reported that secondary data analysis could be limited by bias resulting in incorrect observational assumptions inferring causality. Moreover, Chen et al. (2021) reported that the CDC's 2019 YRBS could be influenced by recall and social desirability bias, resulting in under/overreporting. Additionally, selection bias can persist, despite efforts to mitigate its threat to internal and external validity (Trinh, 2018). Specifically, while the CDC's 2019 YRBS was administered to public and private schools throughout the US, it does not capture data from students who attend vocational schools or alternative schools, limiting the generalizability of the analysis (Underwood et al., 2020). This issue is compounded when accounting for missing data from those respondents who were excluded (Underwood et al., 2020; Chen et al., 2021).

A second limitation of this study is its applicability to all ACEs. Specifically, this analysis of associations between ACEs and organized sports participation is limited to the available variables found in the CDC's 2019 YRBS data set (Chen et al., 2021). Additionally, the aggregation of data under the umbrella variable of LGB does not account for variations in victimization (Semprevivo, 2021). Moreover, the fluidity of sexual identity during the formative years may also result in under/overrepresentation of the study results (Srivastava et al., 2023). Furthermore, this analysis is limited by its

quantitative study design, and absence of narrative data to help identify themes and insight into the impacts of ACEs (Semprevivo, 2021). Lastly, this cross-sectional study is solely exploratory and cannot be used to explain or determine causation.

Significance

Sexual minority adolescents are at significantly increased risk of several poor health outcomes compared to their heterosexual peers. Organized sports participation is a frequently cited avenue to help mitigate adolescent risk behaviors, but participation varies greatly among vulnerable populations (Malm et al., 2019; Wilson & Cariola, 2020). Furthermore, there is a paucity of research examining what barriers exist to prevent organized sports participation. Specifically, little research analyzes the variations in subpopulations within the sexual minority community. As such, this study explores the relationship between ACEs and organized sports participation. A nuanced understanding of any identified associations may lend itself in multiple ways to promote positive social change. The potential findings of this study can be used to inform targeted, culturally competent, and more nuanced public health programs to help promote sports participation among the LGB adolescent community. Additionally, this analysis can help support the policy changes at a school, state, and national level to better support the unique needs of this vulnerable population.

There are multiple implications for positive social change that can be derived from this cross-sectional study. For example, the findings for this study can help develop and foster more interprofessional collaborative efforts among school administration, healthcare providers, and public health practitioners to prioritize programming to address

the alarming prevalence of health risk behaviors within this population. Specifically, this collaboration can help develop safer physical activity spaces for LGB adolescents, often a barrier to organized sports participation. For example, Kulick et al. (2018) reported that LGB youth not only participate in sports at lower rates compared to heterosexual peers, but they also feel significantly less safe in sports facilities, such as locker rooms. Using this study to help inform policies to improve or designate safe spaces can help promote social change and address potential barriers to organized sports participation.

Additionally, the findings of this cross-sectional study can help inform new educational programming for coaches, athletic trainers, and sports medicine providers to include inclusive language and help address issues with sexual-based harassment. Bias and harassment have also been identified as barriers to sports participation among the LGB adolescent community. For example, Kokkonen (2019) reported statistically significant associations between verbal harassment from coaches and sexual orientation. This association is a substantial barrier to organized sports participation in this vulnerable population. Findings from this study can act as foundational concepts for inclusivity training for the coaching staff. As such, this study can help promote policy and social change by addressing potential barriers to organized sports participation.

Summary and Conclusion

Sexual minority adolescents face an increased risk of several acute and long-term poor health outcomes compared to their heterosexual peers. The research literature has identified organized sports participation as an effective intervention to address these issues and improve long-term health outcomes (Easterlin et al., 2019; Malm et al., 2019;).

Unfortunately, organized sports participation varies greatly among populations, including non-heterosexual adolescents. As such, considerable efforts have been introduced to address this issue, but there is still limited information about the factors that promote or limit sports participation (Wilson & Cariola, 2020). Furthermore, there is a notable paucity of research examining various forms of victimization to assess which groups may be most affected by the barriers to organized sports participation. As such, there is a dire need to help identify which factors or associations exist to help inform effective public health efforts.

This cross-sectional study was performed to examine the associations between ACEs, including a history of being bullied, a history of sexual violence, a history of physical violence, and organized sports participation. Informed by the tenets of the Health Belief Model, this study acknowledges that individual health behavior is an amalgam of experience and is influenced by perceptions of benefits, severity, susceptibility, barriers, and their level of self-efficacy (McArthur et al., 2018). This theoretical foundation was operationalized to help develop the following research questions of this study:

Research Question 1: Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Research Question 2: Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Research Question 3: Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

This study and its exploratory research questions are designed to address a substantial gap in the literature. Significant efforts have been made to quantify the prevalence of substance abuse, psychopathology, risk behaviors, and long-term health outcomes among sexual minority individuals (Amost et al., 2020; Easterlin et al., 2019; Heslin & Hall, 2021; Wilson & Cariola, 2019). Researchers have also identified a significant disparity in organized sports participation when stratifying by sexual orientation (Clark et al., 2021; Doull et al., 2018; Knoester & Allison, 2021; Menzal et al., 2019; Wilson et al., 2019). Additionally, several barriers that inhibit organized sports participation have been identified, including fear or harassment and safety concerns (Clark et al., 2021; Kokkonen, 2019; Knoester & Allison, 2021; Kulick et al., 2018). Unfortunately, there is a paucity of evidence describing the associations between ACEs and organized sports participation among sexual minority adolescents. This analysis addressed this gap in efforts to help inform more nuanced public health approaches to promote organized sports participation, inform more inclusive education, develop safer spaces for LGB athletes, and support effective public health efforts to address the concerning health risk behaviors among this vulnerable population. The second section of this study operationalized this gap by describing the study design, foundational methodology, and applicable theoretical tenets.

Section 2: Research Design and Data Collection

Introduction

Substance abuse, psychopathology, and poor health outcomes are significant public health challenges among sexual minority adolescents in the United States. Sports participation has been identified as a protective health factor to reduce the incidence of these challenges. However, disparities in sports participation persist, despite concerted efforts. This quantitative cross-sectional exploratory study was conducted to examine the associations between ACEs, including a history of being bullied, a history of sexual violence, and a history of physical violence, and sports participation among LGB adolescents when controlling for sex, race/ethnicity, and grade. In the second section of this manuscript, I describe and justify the research design, review the methodology related to this analysis, identify the study population and sample methods, examine the instrumentation, construct operationalization, and assess threats to internal and external to validity.

Research Design and Rationale

The CDC's YRBS system is a national system developed in the early 1990s to categorize and quantify the incidence of health-related experiences of adolescents throughout the United States (Rapoport et al., 2019). Data are collected via a biennial national survey of high school students to assess and identify risk behavior trends, morbidity, and social challenges (Rapoport et al., 2019; Underwood, 2020). I selected the YRBS for this analysis due to its inclusion of specific data related to demographics,

sports participation, sexual orientation, bully victimization, sexual violence victimization, and physical violence victimization.

For this analysis, participant data from the 2019 YRBS data set were selected for individuals who identified as LGB. Organized sports participation was selected as the dependent variable, with a history of being bullied on school property (within the past 12 months), a history of forced sexual intercourse, and a history of being in a physical fight (within the past 12 months) selected as the independent variables. These variables were all categorized as dichotomous categorical variables. The control variables selected for this analysis include sex (dichotomous), race/ethnicity(nominal), and grade (nominal). The variables selected for this analysis were operationalized to develop the following research questions:

RQ1: Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

RQ2: Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

RQ3: Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

A cross-sectional study design was selected to efficiently and effectively answer these exploratory research questions. In addition, a cross-sectional study design is well-

suited to best explore the associations between ACEs, including those in Figure 3, and organized sports participation.

Figure 3

Examined Adverse Childhood Experiences

The observational nature of a cross-sectional study design can be aptly utilized to examine associations between multiple variables (Wang & Cheng, 2020). Moreover, this study design can assist public health practitioners in understanding determinants of health and examining features of various populations at a single point in time. Additionally, the utility of this study design includes its inherent cost effectiveness, minimal ethical difficulties, and easy application; however, it results in lower levels of evidence (Spector, 2019; Wang & Cheng, 2020). Public health practitioners have readily utilized this study design to understand the prevalence of disease, help identify populations

disproportionately affected by health conditions, and assess health knowledge and behaviors (Clements, 2020; Wang & Cheng, 2020). Lastly, cross-sectional studies can be administered to diverse and expansive populations with relative ease. This facet allows them to garner vital etiological and representative data that can be appropriately utilized to inform public health programming.

Methodology

Population

The YRBS system is a comprehensive service that helps oversee, catalog, monitor, and identify trends in health behaviors, risk activities, and perceptions of U.S. high school adolescents (CDC, 2021a; Underwood et al., 2020). The YRBS 2019 data set used for this analysis was administered to 13,872 students, Grades 9–12 (CDC, 2021a). This representative sample of students was collected from 136 public and private schools throughout the United States between August 2018 and June 2019 (CDC, 2021a; Underwood et al., 2020). Underwood et al. (2020) reported on the measures to complete the 2019 survey, indicating that the overall response rate for this survey was 60.3%, with a student response rate of 80% and a school response rate of 75%. After the initial collection, 195 surveys were removed secondary to quality control concerns, resulting in 13,677 included in the final data set that was used to perform this analysis (CDC, 2021a; Underwood et al., 2020).

Sampling Procedures

The CDC (2020c) uses a complex method to ensure the YRBS is representative of U.S. high school adolescents. Specifically, YRBS employs a three-stage cluster sample

design to ensure a population with a similar distribution of characteristics (CDC, 2020c). Cluster sampling is an advantageous form of probability sampling for naturally occurring groups, such as sampling specific schools. Moreover, cluster sampling is economically feasible and can be employed with relative ease when focusing on larger populations (Berndt, 2020). Sampling occurred in each state, territorial, tribal, and large urban school districts. Inclusion criteria included charter, public, private, and parochial schools with students in at least one high school grade (CDC, 2020c; Underwood et al., 2020). Exclusion criteria for school sampling included academic settings with less than 40 students across ninth–12th grade, vocational schools, alternative schools, U.S. Department of Defense schools, and educational centers under the Bureau of Indian Education (CDC, 2020c; Underwood et al., 2020). Data were compiled by the National Center for Education (NCES) and Market Data Retrieval, Inc. (Underwood et al., 2020).

The three-stage cluster sample method employed for the 2019 YRBS allowed for a nationally representative sample of U.S. high school adolescents (Berndt, 2020; Underwood, 2020). The initial phase of this process included the development of 1,257 primary sampling units (PSUs) composed of various counties. These counties were then stratified into 16 divisions according to their metropolitan statistical area statuses and racial/ethnic compositions (Underwood et al., 2020). Of the original 1,257 PSUs, 54 were selected and sampled with probability proportional to the overall enrollment size for the schools selected (Underwood et al., 2020). The secondary sampling phase included the development of secondary sampling units comprised of physical schools with ninth–12th grades and compositions schools created by combining nearby academic centers to

provide data for all four grades (Underwood et al., 2020). Finally, the tertiary phase of sampling included a random sampling of one or two classrooms per grade in prerequisite courses, such as English or during homeroom (Underwood et al., 2020). This three-staged sampling method facilitated a representative sample of U.S. adolescent students.

Data Collection Procedures

Data collection for the 2019 YRBS was completed via a 99-question, computer-scannable, multiple-choice survey administered during a single school class period (CDC, 2020c; Underwood et al., 2020). Before the data collection, each question was evaluated and assessed during the design phase for appropriate readability and formatting before being approved and included in the survey. Additionally, before administration, the study design, questionnaires, and collection procedures were approved by the CDC's Institutional Review Board (CDC, 2020c; Underwood et al., 2020). During the administration phase, participants were informed that all study results were anonymous and voluntary (Underwood et al., 2020). Additionally, for participants under 18 years of age, parental consent was obtained before completing the questionnaire (Underwood et al., 2020).

Data Availability and Permissions

Data collected through the 2019 YRBS is publicly available in multiple downloadable formats via the CDC's Adolescent and School Health YRBSS website. The available file formats include Access and ASCII, which can be converted into SAS and SPSS data sets for further examination. In addition, national data files are immediately available to download and readily available. Conversely, state, district,

territory, or tribal government data files may require prior permission, which can be obtained via a YRBSS data request form (CDC, 2022e).

Data Quality and Reputability

The data used to perform this analysis have been appropriately tested for validity and reliability through multiple measures (Charles et al., 2022; Underwood et al., 2020). The CDC YRBS system has continuously examined student health behaviors since its inception in 1991 and regularly assesses the YRBS for reliability (Charles et al., 2022). Specifically, the CDC has frequently revisited survey questions to assess readability and relatability to current public health concerns. Additionally, the YRBS system has continued to integrate new questions to increase the scope of data collected and measure emerging risk behaviors (Charles et al., 2022; Underwood et al., 2020). Moreover, test–retest analyses assess each survey question for reliability (Underwood et al., 2020). As such, the data quality and reputability of the CDC's 2019 YRBS contribute to the rationale for selecting this data set for the current analysis.

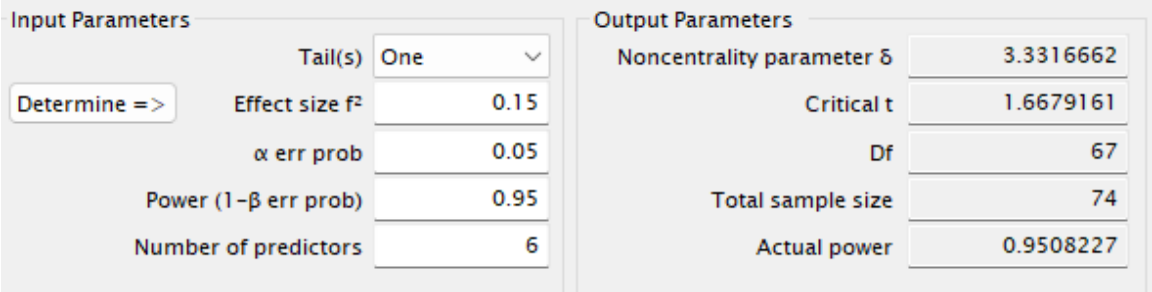
Power Analysis

When examining the associations between variables, it is integral to conduct a power analysis to determine the necessary sample size (Kemal, 2020; Uttley, 2019). Performing an a priori power analysis assists in the study design and planning phase (Bujang, 2021). While this process was historically reserved for experimental studies, including a power analysis has become an integral justification component of observational studies (Bujang, 2021). To perform this exploratory cross-sectional, observational analysis, the free and publicly available software G*Power Version 3.1.9.7

was downloaded and used to conduct a power analysis. Using this software, I performed an a priori type of power analysis. The input and output data are presented in Figure 4. A multiple linear regression was selected as the statistical test. The anticipated effect size was set to 0.15, with a statistical power of 0.95 and a probability level of 0.05. The number of predictor variables was set to 6. The power analysis was then performed and yielded a minimum sample size of 75 to ensure adequate power.

Figure 4

*G*Power Power Analysis Output Data*



Operationalization of Constructs

This analysis was conducted to examine whether there are associations between selected ACEs and sports participation among LGB adolescents. The 2019 YRBS and the YRBS data set include all the relevant variables needed to perform this assessment. As defined and operationalized in Table 1, the dependent variable for this analysis is sports participation, while the independent variables include bully victimization, sexual violence victimization, and physical violence victimization. These variables are dichotomous variables, with yes/no responses. The control variables for this analysis include the dichotomous variable sex and nominal variables race/ethnicity, and grade.

Table 1

Operationalization of Variables

Variable name	Variable category	Definition	Coding method
Sports participation	Dependent, dichotomous	Did play on at least one sports, run by school or community groups, within the past 12 months	0 = No; 1 = Yes
Bully victimization	Independent, dichotomous	Was bullied on school property during the 12 months before the survey	0 = No; 1 = Yes
Sexual violence victimization	Independent, dichotomous	Was physically forced to have sexual intercourse when they did not want to	0 = No; 1 = Yes
Physical violence victimization	Independent, dichotomous	Was in a physical fight one or more times during the 12 months before the survey	0 = No; 1 = Yes
Sex	Control, dichotomous	Male or female	0 = Female; 1 = Male
Race/ethnicity	Control, nominal	Black or African American, Hispanic/Latino, White, other races	1 = Black or African American; 2 = Hispanic/Latino; 3 = White; 4 = Other races
Grade	Control, nominal	9th grade, 10th grade, 11th grade, 12th grade	1 = 9th grade, 2 = 10th grade, 3 = 11th grade, 4 = 12th grade

Data Analysis Plan

For this analysis the CDC's 2019 YRBS national data set from the CDC's Adolescent and School Health YRBSS Data and Documentation website was downloaded. This data set was downloaded as an ASCII file, converted to an excel file, then uploaded to SPSS. The data set was sorted to include only respondents to the 2019 YRBS who identified as LGB. Before becoming publicly available, the 2019 YRBSS national data set is thoroughly analyzed and cleaned for errors or inconsistencies (CDC, 2022e). Also, missing data are not statistically assigned, which did not impact this

observational study (Underwood et al.,2020). The analysis for this cross-sectional study was performed utilizing IBM'S SPSS version 28.0 (IBM, 2023; Walden University, 2023).

Research Questions

The data analysis for this cross-sectional study answered the following research questions:

Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Statistical Analysis of Research Questions

The data analysis for this cross-sectional study included descriptive and inferential statistics. After highlighting the descriptive statistics of the selected participant population, a bivariate analysis was performed. This bivariate analysis was done to determine the associations between every single independent variable (bully victimization, sexual violence victimization, physical violence victimization) and the dependent variable (sports participation) when controlling for sex, race/ethnicity, and

grade. Additionally, a binomial logistic regression was used to assess the associations between all the previously mentioned independent variables and dependent variable, when controlling for sex, race/ethnicity, and grade.

Assumptions

When utilizing binomial logistic regression models, there are several associated underlying assumptions. These assumptions are required to ensure the statistical model works as expected and avoids misleading results (Harris, 2021). There are five primary assumptions when performing a binomial logistic regression. First, the dependent variable is measured on a categorical, dichotomous scale. Second, the dependent variable is mutually exclusive and exhaustive. Third, there are one or more independent variables, which are continuous or categorical (Harris, 2021; Laerd Statistics, 2018; Roback & Legler, 2021). Fourth, there is no multicollinearity among independent variables and an absence of outliers (Harris, 2021; Laerd Statistics, 2018). Lastly, there must be a linear relationship between the continuous independent variables and the transformed dependent variable. The first four assumptions were assessed prior to the completion of the analysis. The final assumption was assessed using SPSS Statistics Version 28 (Laerd Statistics, 2018).

Inclusion of Potential Covariates

The control variables of sex, race/ethnicity, and grade were selected due to their potential influence on organized sports participation. In addition, as noted in the literature review, these variables are associated with variations in sports participation (Easterlin et al., 2019; Guddal et al., 2019; Hyde et al., 2020; Project Play, 2023; Wiim & Säfvenbom,

2019). As such, it is vital to include them in this analysis to quantify their influence on this study population.

Threats to Validity

Identifying threats to validity is vital to help improve the overall success of answering the proposed research questions. Therefore, it is essential to address several potential threats when examining threats to validity, including internal and external validity. Internal validity, which relates to how well a study is conducted, was addressed by the CDC's sampling methodology. Selection bias, an inherent threat to the internal validity of cross-sectional studies, was mitigated by the three-staged sampling methods employed by the 2019 YRBS (CDC, 2022e; Underwood, 2020). Additionally, maturation and testing bias were avoided by using a single test point on an anonymous and voluntary basis (Underwood et al., 2020). Lastly, to mitigate non-respondent bias, the CDC utilized a nuanced weighting system on several demographic variables to ensure that the data were representative of the U.S. adolescent high school population (Underwood et al., 2020).

External validity, or how applicable or inferential the findings are, was also addressed in the survey administration phase. Specifically, threats to population validity were mitigated through the widespread administration of this survey, which included 13,872 respondents. In addition, the authors excluded 195 respondents who did not complete the survey (Underwood et al., 2020). However, the study results remained limited to the selected study population and were not applicable, transferable, or generalizable to broader populations.

Ethical Procedures

When performing research involving human participants, it is imperative to address several ethical considerations, including consent, confidentiality, and anonymity (Sim & Waterfield, 2019). First, the YRBSS ensured appropriate consenting procedures were followed, including parental consent before participation in the 2019 YRBS. Okafor et al. (2020) reported that the national YRBS adhered to local parental procedures passed in the jurisdiction in which the survey was being administered. Assured confidentiality was optimized for participants during the administration by instructing facilitators to spread out the student participants to minimize the opportunity for students to see each other's responses (CDC, 2020d). Additionally, facilitators were encouraged to limit the ability of participants to talk with others while completing the survey and instruct students to use an extra sheet of people to cover responses while they worked (CDC, 2020d). Lastly, anonymity was preserved by ensuring no identifiable information was collected from study participants (Underwood et al., 2020). Additionally, the voluntary basis of the data collection ensured that individuals were not coerced into participating. These measures effectively limit the ethical concerns when performing this secondary data analysis.

Summary

Substance abuse, psychopathology, and poor health outcomes are substantial public health challenges among U.S. sexual minority adolescents. Sports participation has been identified as a protective health factor to reduce the incidence of these challenges. However, disparities in sports participation persist, despite concerted efforts.

Understanding what influences these disparities is essential to develop informed public health programming. Data from the 2019 YRBS, specifically from participants who identified as LGB, were utilized to perform this exploratory, cross-sectional, quantitative study.

The data garnered through the 2019 YRBS was used to examine the associations between ACEs and organized sports participation when controlling for sex, race/ethnicity, and grade. The dependent variable utilized for this analysis is organized sports participation, defined as participating in at least one community or school sports team within the past 12 months. The independent variables included bully victimization, defined as being bullied on school property at least once within the past 12 months, sexual violence victimization, defined as a history of forced sexual intercourse, and physical violence victimization, defined as involvement in a physical fight within the past 12 months. These variables are measured as dichotomous and categorical. The control variables include sex (dichotomous), race/ethnicity (nominal), and grade (nominal). Descriptive statistics were calculated on these variables, and both bivariate analyses and binomial logistic regression was performed to address the three exploratory research questions. The study design selected for this analysis is not limited by considerable threats to validity or ethical concerns. The tertiary section of this study further contributes to this analysis by presenting all relevant results and study findings.

Section 3: Presentation of Results and Findings

Introduction

The purpose of this quantitative, cross-sectional study was to investigate associations between ACEs, including bully victimization, sexual violence victimization, and physical violence victimization, and sports participation among LGB high school students when controlling for sex, race/ethnicity, and grade. This study posed three research questions constructed with organized sports participation as the dependent variable, a history of bully victimization, sexual violence victimization, and physical violence victimization as the independent variables, and sex, race/ethnicity, and grade as the control variables. In Section 3, I review the research questions and associated hypotheses, describe the methods used to access the CDC 2019 YRBS data set, and present the results of the statistical analysis used for this investigation. The following were the research questions and hypotheses:

RQ1: Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$1: There is no statistically significant association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a1: There is a statistically significant association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

RQ2: Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$2: There is no statistically significant association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a2: There is a statistically significant association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

RQ3: Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

$H_0$3: There is no statistically significant association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

H_a3: There is a statistically significant association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade.

Secondary Data Access and Analysis

The research questions formulated in this study were best addressed using a cross-sectional study design to examine associations between ACEs and organized sports participation among LGB high school students. A secondary data analysis was performed

using the CDC's YRBS 2019 data set (CDC, 2020a). This data set was downloaded as an ASCII file from the CDC's Adolescent and School Health YRBSS Data and Documentation website. This file was then converted to a CSV file and uploaded to IBM's SPSS Version 28.0. This data set included all the required variables to conduct this analysis:

- Dependent variable: Organized sports participation (participated in at least one sport run by school or community groups within the past 12 months)
- Independent variables: Bully victimization (was bullied on school property during the 12 months before the survey), sexual violence victimization (was physically forced to have sexual intercourse when did not want to), and physical violence victimization (was in a physical fight one or more times during the 12 months before the survey)
- Control variables: Sex, race/ethnicity, and grade

Data Collection Time Frame and Response Rates

Data collection for the 2019 YRBS was completed between August 2018 and June 2019 via a 99-question, computer-scannable, multiple-choice survey administered during a single school class period (CDC, 2020c; Underwood et al., 2020). The overall response rate for this survey was 60.3%, with a student response rate of 80%, and a school response rate of 75% (Underwood et al., 2020). After the initial collection, 195 surveys were removed due to quality control concerns, resulting in 13,677 valid surveys used to perform this analysis (CDC, 2021a; Underwood et al., 2020).

Data Set Variables and Analysis

As this cross-sectional study was conducted to examine associations between ACEs and organized sports participation among LGB high school students, a filter was applied to the 13,677 valid surveys to identify responses from high school students who identified as lesbian, gay, or bisexual, which resulted in 992 surveys. This represented 7.25% of the valid surveys from the 2019 YRBS data set. Data were complete for all the filtered surveys; therefore, no further modifications were required to perform the analysis. The analysis was performed using IBM's SPSS 28.0. Descriptive and inferential statistics were calculated for all variables to identify significant associations between the identified variables.

Results

In this quantitative cross-sectional study, I used secondary analysis to investigate whether associations exist between ACEs and organized sports participation among LGB high school students, when controlling for sex, race/ethnicity, and grade.

Frequency Distributions

A total of 764 (77%) respondents identified as female and 228 (23%) as male. Of the respondents, 131 (13.2%) identified as lesbian, 97 (9.8%) identified as gay, and 764 (77%) identified as bisexual. Additionally, 148 (14.9%) identified as Black, 260 (26.2%) as Hispanic, 467 (47.1%) as White, and 117 (11.8%) as other race. When examining grade level, 223 (22.5%) reported that they were in ninth grade, 295 (29.7%) reported 10th grade, 224 (24.6%) reported 11th grade, and 230 (23.2%) reported 12th grade.

With regards to study variables, 412 (41.5%) of respondents reported current organized sports participation, defined as participating in at least one sport run by either a school or community organization within the past 12 months, of which 315 (76.5%) identified as female and 97 (23.5%) as male. Additionally, 99 (24%) of these 412 respondents identified as lesbian or gay, while 313 (76%) identified as bisexual. When examining ACEs, 303 (30.5%) reported prior bully victimization, defined as being bullied on school property within the past 12 months, of which 230 (75.9%) identified as female and 73 (24.1%) as male. Of the respondents who reported current bully victimization, 67 (22.1%) identified as lesbian or gay, and 236 (77.8%) identified as bisexual. For sexual violence victimization, defined as being physically forced to have sexual intercourse when not wanting to, 192 (19.4%) reported a history of forced sexual intercourse, of which 160 (83.3%) identified as female and 32 (16.7%) as male. Of the respondents who reported a history of forced sexual intercourse, 34 (17.7%) identified as lesbian or gay, and 158 (82.3%) identified as bisexual. Lastly, 239 (24.1%) respondents reported prior physical violence victimization, defined as being in a physical fight one or more times in the last 12 months, of which 182 (76.2%) identified as female and 57 (23.8%) as male. Of the respondents who reported a current history of physical violence victimization, 45 (18.8%) identified as lesbian or gay, and 194 (81.2%) identified as bisexual. These frequency distributions are presented in Tables 2, 3, and 4.

Table 2

Frequency Distributions of Study Variables

Variable	Frequency	Percentage
Sex		
Female	764	77.0%
Male	228	23.0%
Sexual orientation		
Lesbian	131	13.2%
Gay	97	9.8%
Bisexual	764	77.0%
Race/ethnicity		
Black	148	14.9%
Hispanic	260	26.2%
White	467	47.1%
Other	117	11.8%
Grade		
9th	223	22.5%
10th	295	29.7%
11th	224	24.6%
12th	230	23.2%
Current organized sports participation		
Yes	412	41.5%
No	580	58.5%
Current bully victimization		
Yes	303	30.5%
No	689	69.5%
History of sexual violence victimization		
Yes	192	19.4%
No	800	80.6%
Current physical violence victimization		
Yes	239	24.1%
No	753	75.9%

Table 3

Frequency Distributions of Study Variables by Sex

Variable	Frequency	Percentage
Current organized sports participation		
Female	315	76.5%
Male	97	23.5%
Current bully victimization		
Female	230	75.9%
Male	73	24.1%
History of sexual violence victimization		
Female	160	83.3%
Male	32	16.7%
Current physical violence victimization		
Female	182	76.2%
Male	57	23.8%

Table 4

Frequency Distributions of Study Variables by Sexual Orientation

Variable	Frequency	Percentage
Current organized sports participation		
Lesbian or gay	99	24.0%
Bisexual	313	76.0%
Current bully victimization		
Lesbian or gay	67	22.1%
Bisexual	236	77.8%
History of sexual violence victimization		
Lesbian or gay	34	17.7%
Bisexual	158	82.3%
Current physical violence victimization		
Lesbian or gay	45	18.8%
Bisexual	194	81.2%

Bivariate Analyses

Bivariate analyses were performed using chi-square tests of independence to examine and evaluate the associations between sex and each study variable. These

analyses demonstrated a statistically significant relationship between sex and sexual violence victimization (χ^2 (1) = 5.367, p = 0.021) with a weak effect size (0.074). These analyses indicate there is not a statistically significant relationship between sex and sports participation (χ^2 (1) = 0.125, p = 0.724), sex and bully victimization (χ^2 (1) = 0.303, p = 0.582), sex and physical violence victimization (χ^2 (1) = 0.133, p = 0.715), sex and race/ethnicity (χ^2 (3) = 5.686, p = 0.128), or sex and grade (χ^2 (3) = 1.017, p = 0.797. The results of these analyses are presented in Table 5.

Table 5

Bivariate Analyses: Sex and Study Variables

Variable	Pearson chi-square	Asymptotic significance	Cramer's V
Current organized sports participation	0.125	0.724	
Current bully victimization	0.303	0.582	
History of sexual violence victimization	5.367	0.021	0.074
Current physical violence victimization	0.133	0.715	
Race/ethnicity	5.686	0.128	
Grade	1.017	0.797	

A chi-square test of independence was also performed to examine the associations between sexual orientation and each study variable. These analyses determined a statistically significant association between sexual orientation and sex, (χ^2 (1) = 63.986, p < 0.001) with a moderate effect size (0.254). There were no statistically significant associations between sexual orientation and sports participation, (χ^2 (1) = 0.435, p = 0.510), sexual orientation and bully victimization (χ^2 (1) = 0.187, p = 0.665), sexual orientation and sexual violence victimization (χ^2 (1) = 3.743 p = 0.053), sexual orientation and physical violence victimization (χ^2 (1) = 3.071, p = 0.080), sexual

orientation and race (χ^2 (3) = 6.585, p = 0.86), or sexual orientation and grade (χ^2 (3) = 5.29, p = 0.154), The results of these analyses are presented in Table 6.

Table 6

Bivariate Analyses: Sexual Orientation and Study Variables

Variable	Pearson chi-square	Asymptotic significance	Cramer's V
Current organized sports participation	0.435	0.51	
Current bully victimization	0.187	0.51	
History of sexual violence victimization	3.743	0.053	
Current physical violence victimization	3.071	0.08	
Sex	63.986	<0.001	0.254
Race/ethnicity	6.585	0.86	
Grade	5.259	0.154	

Lastly, I performed a chi-square test of independence to examine associations between the dependent variable, organized sports participation, and each independent and control variable. These analyses determined statistically significant associations between organized sports participation and bully victimization (χ^2 (1) = 3.922, p = 0.048) with a weak effect size (0.063), organized sports participation and sexual violence victimization (χ^2 (1) = 7.921, p = 0.005) with a weak effect size (0.089), and organized sports participation and physical violence victimization (χ^2 (1) = 10.726, p = 0.001) with a weak effect size (0.104). There were no statistically significant associations between organized sports participation and race (χ^2 (3) = 2.539, p = 0.468), organized sports participation and sex (χ^2 (1) = 0.125, p = 0.724), as previously noted, or organized sports participation and grade (χ^2 (3) = 6.22, p = 0.101). The results of these analyses are presented in Table 7.

Table 7

Bivariate Analyses: Organized Sports Participation and Study Variables

Variable	Pearson chi-square	Asymptotic significance	Cramer's V
Current bully victimization	3.922	0.048	0.063
History of sexual violence victimization	7.921	0.005	0.089
Current physical violence victimization	10.726	0.001	0.104
Sex	2.539	0.468	
Race/ethnicity	0.125	0.724	
Grade	6.22	0.101	

Multivariate Analysis

To address the proposed research questions, a two-step binomial logistic regression was employed to examine the associations between the independent variables, bully victimization, sexual violence victimization, and physical violence victimization, and the dependent variable, organized sports participation. The first step of the hierarchical analysis included the control variables, sex, race/ethnicity, and grade, as covariates, and organized sports participation as the dependent variable. The second step included the independent variables, which were individually added to the control variables to examine the differences between the two steps and address the specific research questions.

Several assumptions were evaluated prior to running these analyses to examine the appropriateness of utilizing a binomial logistic regression model (Harris, 2021; Hilbe, 2016; Kwak & Clayton-Matthews, 2002; Stoltzfus, 2011). In binomial logistic regression, the first assumption requires that the dependent variable is a dichotomous, nominal variable (Harris, 2021). For this analysis, the selected dependent variable, organized sports participation, was a nominal variable with only two outcomes, *yes* or *no*, fulfilling

this criterion. The second assumption requires that all dichotomous dependent variables and all nominal independent variables are mutually exhaustive and exclusive (Harris, 2021; Stoltzfus, 2011). This criterion was fulfilled since the dependent and independent variables were dichotomous, *yes* or *no*. As such, these variables are mutually exclusive, in that participant responses cannot fall into more than one category (Harris, 2021). Additionally, these variables are mutually exhaustive since they are defined by *yes* and *no* which includes all possible outcomes for the variable. The control variable of sex was also dichotomous, *male* or *female*, and mutually exclusive. While the control variables of race/ethnicity and grade were not dichotomous, they were mutually exclusive.

The third assumption requires an absence of multicollinearity among the independent variables (Harris, 2021; Stoltzfus, 2011). Multicollinearity among the independent and control variables was evaluated using a Spearman correlation coefficient. The results of this analysis, as presented in Table 8, indicated there was no Spearman correlation coefficient with a value of 0.70 or greater; therefore, no variables used in this analysis were correlated with each other. The assumption requiring a linear relationship between the dependent variable and continuous independent variables did not require evaluation, as this model did not include continuous independent variables. Similarly, the final assumption, that there are no outliers, did not require evaluation since this model did not include continuous variables.

Table 8

Spearman Correlation Coefficients Evaluating Multicollinearity

			Bully victimization	Sexual violence victimization	Physical violence victimization	Sex	Race/Ethnicity	Grade
Spearman's rho	Bully victimization	Correlation Coefficient	1.000	.190**	.113**	.017	.125**	-.068*
		Sig. (2-tailed)	.	<.001	<.001	.583	<.001	.031
		N	992	992	992	992	992	992
	Sexual violence victimization	Correlation Coefficient	.190**	1.000	.189**	-.074*	.058	.043
		Sig. (2-tailed)	<.001	.	<.001	.021	.068	.180
		N	992	992	992	992	992	992
	Physical violence victimization	Correlation Coefficient	.113**	.189**	1.000	.012	-.111**	-.097**
		Sig. (2-tailed)	<.001	<.001	.	.715	<.001	.002
		N	992	992	992	992	992	992
	Sex	Correlation Coefficient	.017	-.074*	.012	1.000	.075*	.025
		Sig. (2-tailed)	.583	.021	.715	.	.017	.432
		N	992	992	992	992	992	992
	Race/Ethnicity	Correlation Coefficient	.125**	.058	-.111**	.075*	1.000	.020
		Sig. (2-tailed)	<.001	.068	<.001	.017	.	.522
		N	992	992	992	992	992	992
	Grade	Correlation Coefficient	-.068*	.043	-.097**	.025	.020	1.000
		Sig. (2-tailed)	.031	.180	.002	.432	.522	.
		N	992	992	992	992	992	992

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Research Question 1

Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Relevant Findings

Research question 1 was investigated using a two-step, hierarchical, binomial logistic regression to evaluate the effects of the control variables, sex, race/ethnicity, and grade, and bully victimization, defined as being bullied on school property within the past 12 months, on the likelihood that survey respondents participated in organized sports. The results of the first step of the modeling were not statistically significant, $\chi^2(7) = 9.186$, $p = 0.240$. The Nagelkerke R Square statistic denoted that step one of this modeling explained 1.2% of the variance in organized sports participation and correctly identified 58.4% of the cases. No control variables were statistically significant. These results are presented in Table 9.

Table 9

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, and Grade

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			2.746	3	.433			
	Race/Ethnicity(1)	-.309	.210	2.173	1	.140	.734	.487	1.107
	Race/Ethnicity(2)	-.152	.191	.631	1	.427	.859	.591	1.249
	Race/Ethnicity(3)	-.033	.250	.017	1	.897	.968	.593	1.581
	Sex(1)	.062	.154	.161	1	.688	1.064	.787	1.439
	Grade			6.458	3	.091			
	Grade(1)	-.051	.179	.083	1	.774	.950	.669	1.348
	Grade(2)	-.237	.188	1.587	1	.208	.789	.546	1.141
	Grade(3)	-.431	.193	5.002	1	.025	.650	.445	.948
	Constant	-.030	.205	.021	1	.885	.971		

a. Variable(s) entered on step 1: Race/Ethnicity, Sex, Grade.

The results of the second step of the modeling were also not statistically significant, $\chi^2(8) = 12.808$, $p = 0.119$. The Nagelkerke R Square statistic indicated that the second step of this modeling explained 1.7% of the variance in organized sports participation and correctly classified 57.9% of cases. No statistically significant associations were identified between the three control variables, the independent variable, bully victimization, and the dependent variable, organized sports participation. The results of this analysis are presented in Table 10.

Table 10

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, Grade, and Bully Victimization

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			3.046	3	.385			
	Race/Ethnicity(1)	-.339	.211	2.583	1	.108	.713	.472	1.077
	Race/Ethnicity(2)	-.206	.193	1.137	1	.286	.814	.557	1.189
	Race/Ethnicity(3)	-.074	.252	.085	1	.770	.929	.567	1.521
	Sex(1)	.060	.154	.150	1	.699	1.062	.784	1.436
	Grade			5.864	3	.118			
	Grade(1)	-.044	.179	.059	1	.808	.957	.674	1.360
	Grade(2)	-.208	.189	1.211	1	.271	.812	.561	1.176
	Grade(3)	-.414	.193	4.579	1	.032	.661	.452	.966
	Bully victimization(1)	.270	.142	3.631	1	.057	1.311	.992	1.731
	Constant	-.088	.208	.181	1	.671	.915		

a. Variable(s) entered on step 1: Bully Victimization.

Research Question 2

Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Relevant Findings

Research question 2 was investigated by utilizing a two-step, hierarchical, binomial logistic regression to evaluate the effects of the control variables, sex, race/ethnicity, and grade, and sexual violence victimization, defined as a history of forced

sexual intercourse, on the likelihood that survey respondents participated in organized sports. The results of the first step of the modeling were not statistically significant, χ^2 (7) = 9.186, p = 0.240. The Nagelkerke R Square statistic denoted that step one of this modeling explained 1.2% of the variance in organized sports participation and correctly identified 58.4% of the cases. No control variables were found to be statistically significant, as presented in Table 11.

Table 11

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, and Grade

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			2.746	3	.433			
	Race/Ethnicity(1)	-.309	.210	2.173	1	.140	.734	.487	1.107
	Race/Ethnicity(2)	-.152	.191	.631	1	.427	.859	.591	1.249
	Race/Ethnicity(3)	-.033	.250	.017	1	.897	.968	.593	1.581
	Sex(1)	.062	.154	.161	1	.688	1.064	.787	1.439
	Grade			6.458	3	.091			
	Grade(1)	-.051	.179	.083	1	.774	.950	.669	1.348
	Grade(2)	-.237	.188	1.587	1	.208	.789	.546	1.141
	Grade(3)	-.431	.193	5.002	1	.025	.650	.445	.948
	Constant	-.030	.205	.021	1	.885	.971		

a. Variable(s) entered on step 1: Race/Ethnicity, Sex, Grade.

The results of the second step of the modeling were statistically significant, χ^2 (8) = 18.011, p = 0.021. The Nagelkerke R Square statistic indicated that the model could explain 2.4% of the variance in organized sports participation and correctly identified 59.4% of the cases. Sexual victimization was found to be statistically significant (p =

0.003, 95% CI [1.180-2.243]). Additionally, individuals who reported a history of sexual violence victimization were 1.6 times more likely to participate in sports. The results of this analysis are presented in Table 12.

Table 12

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, Grade, and Sexual Victimization

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			2.924	3	.403			
	Race/Ethnicity(1)	-.328	.211	2.422	1	.120	.720	.477	1.089
	Race/Ethnicity(2)	-.196	.192	1.036	1	.309	.822	.564	1.199
	Race/Ethnicity(3)	-.059	.251	.055	1	.814	.943	.576	1.543
	Sex(1)	.099	.155	.407	1	.523	1.104	.814	1.497
	Grade			7.057	3	.070			
	Grade(1)	-.075	.180	.172	1	.678	.928	.653	1.320
	Grade(2)	-.264	.189	1.947	1	.163	.768	.530	1.113
	Grade(3)	-.461	.194	5.653	1	.017	.630	.431	.922
	Sexual violence victimization(1)	.487	.164	8.835	1	.003	1.627	1.180	2.243
	Constant	-.086	.207	.171	1	.679	.918		

a. Variable(s) entered on step 1: Sexual Victimization.

Research Question 3

Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade?

Relevant Findings

Research question 3 was investigated by utilizing a two-step, hierarchical, binomial logistic regression to evaluate the effects of the control variables, sex, race/ethnicity, and grade, and physical violence victimization, defined as a history of physical fights, on the likelihood that survey respondents participated in organized sports. The results of the first step of the modeling were not statistically significant, $\chi^2(7) = 9.186$, $p = 0.240$. The Nagelkerke R Square statistic denoted that the model explained 1.2% of the variance in organized sports participation and correctly identified 58.4% of the cases. No control variables were found to be statistically significant, as presented in Table 13.

Table 13

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, and Grade

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			2.746	3	.433			
	Race/Ethnicity(1)	-.309	.210	2.173	1	.140	.734	.487	1.107
	Race/Ethnicity(2)	-.152	.191	.631	1	.427	.859	.591	1.249
	Race/Ethnicity(3)	-.033	.250	.017	1	.897	.968	.593	1.581
	Sex(1)	.062	.154	.161	1	.688	1.064	.787	1.439
	Grade			6.458	3	.091			
	Grade(1)	-.051	.179	.083	1	.774	.950	.669	1.348
	Grade(2)	-.237	.188	1.587	1	.208	.789	.546	1.141
	Grade(3)	-.431	.193	5.002	1	.025	.650	.445	.948
	Constant	-.030	.205	.021	1	.885	.971		

a. Variable(s) entered on step 1: Race/Ethnicity, Sex, Grade.

The results of the second step of the modeling were statistically significant, χ^2 (8) = 18.048, p = 0.021. The Nagelkerke R Square statistic indicated that the model explained 2.4% of the variance in organized sports participation and correctly identified 59.6% of the cases. Physical violence victimization was found to be statistically significant (p = 0.003, 95% CI [1.168-2.124]). Additionally, individuals who reported physical violence victimization within the past 12 months were 1.5 times more likely to participate in organized sports. The results of this analysis are presented in Table 14.

Table 14

Logistic Regression Predicting the Likelihood of Organized Sports Participation Based on Race/Ethnicity, Sex, Grade, and Physical Violence Victimization

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Race/Ethnicity			2.393	3	.495			
	Race/Ethnicity(1)	-.256	.212	1.469	1	.226	.774	.511	1.172
	Race/Ethnicity(2)	-.063	.194	.106	1	.745	.939	.641	1.374
	Race/Ethnicity(3)	.023	.252	.008	1	.927	1.023	.624	1.678
	Sex(1)	.052	.155	.115	1	.734	1.054	.778	1.427
	Grade			5.122	3	.163			
	Grade(1)	-.043	.180	.056	1	.813	.958	.674	1.363
	Grade(2)	-.196	.189	1.070	1	.301	.822	.567	1.191
	Grade(3)	-.389	.194	4.020	1	.045	.677	.463	.991
	Physical violence victimization(1)	.454	.153	8.874	1	.003	1.575	1.168	2.124
	Constant	-.224	.217	1.068	1	.301	.799		

a. Variable(s) entered on step 1: Physical Violence Victimization.

Summary

This study included three research questions that were constructed with organized sports participation as the dependent variable, bully victimization, sexual violence victimization, and physical violence victimization as the independent variables, and sex, race/ethnicity, and grade as the control variables. A series of bivariate and multivariate analyses were performed to investigate the associations between these variables. The bivariate analyses were completed using Chi-Square Tests of Independence to investigate the relationship between each control and independent variable and organized sports participation. These analyses determined that there is a statistically significant relationship between organized sports participation and bully victimization (χ^2 (1) = 3.922, p = 0.048) with a small effect size (0.063), organized sports participation and sexual violence victimization (χ^2 (1) = 7.921, p = 0.005) with a small effect size (0.089), and organized sports participation and physical violence victimization (χ^2 (1) = 10.726, p = 0.001) with a small effect size (0.104). No statistically significant associations were identified between organized sports participation and race, sex, or grade.

Binomial logistic regression was used to address the first research question: Is there an association between a history of being bullied at school and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade? The multivariate analysis indicated no statistically significant association between bully victimization and organized sports participation, when controlling for sex, race/ethnicity, and grade. Therefore, the null hypothesis for this research question was not rejected.

Similarly, a binomial logistic regression was used to address the second research question: Is there an association between a history of sexual violence and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade? The multivariate analysis indicated a statistically significant association between sexual violence victimization and organized sports participation, when controlling for sex, race/ethnicity, and grade. Therefore, the null hypothesis for this research question was rejected.

Lastly, a binomial logistic regression was used to address the third research question: Is there an association between a history of physical fights and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade? The multivariate analysis indicated a statistically significant association between physical violence victimization and organized sports participation, when controlling for sex, race/ethnicity, and grade. Therefore, the null hypothesis for this research question was rejected.

Substance abuse, peer violence, sexual violence, and psychopathology are significant public health concerns affecting sexual minority adolescents in the US. Sports participation has been identified as a protective health factor to reduce the incidence of them. However, despite concerted efforts, disparities in sports participation persist. Additionally, ACEs, including bully victimization, sexual violence victimization, and physical violence victimization, disproportionately affect this vulnerable population (Johns et al., 2020; Schwab-Resse et al., 2018; Strogner et al., 2021). As such, this study was designed to examine the associations between ACEs and organized sports

participation to better understand potential barriers and drivers of these various public health issues among sexual minority adolescents. Section four of this study synthesizes and expands upon the reported results, discusses limitations, proposes recommendations, and identifies vital opportunities for social change.

Section 4: Application to Professional Practice and Implication for Social Change

Introduction

Substance abuse, peer violence, sexual violence, and psychopathology are significant public health concerns affecting sexual minority adolescents in the United States. Sexual minority adolescents report higher rates of peer violence, sexual violence, substance abuse, and suicidality than their heterosexual peers (Eckstrand et al., 2019; Fix et al., 2021; Medina-Martinez et al., 2021). These detrimental factors, combined with the inherent difficulties associated with the formative years of adolescence, can result in lifelong poor health outcomes. Youth sports participation has been identified as a reliable avenue to promote physical activity and is associated with a spectrum of favorable health outcomes, such as a lower prevalence of obesity, anxiety, substance abuse, and self-harm (Easterlin et al., 2019). Despite these well-documented benefits, sports participation rates among sexual minority adolescents vary greatly (Wilson & Cariola, 2020).

Considerable efforts have been made to increase access to sports among marginalized populations; however, there is limited research into which factors may influence sports participation. The purpose of this quantitative study was to investigate the associations between ACEs, including bully victimization, sexual violence victimization, and physical violence victimization and organized sports participation among LGB adolescent high school students, when controlling for sex, race/ethnicity, and grade.

A cross-sectional study design was used to examine the associations between self-reported bully victimization within the past 12 months, history of sexual violence,

physical violence victimization within the past 12 months, and organized sports participation among LGB adolescent high school students. An analysis of secondary data was performed using the CDC's 2019 YRBS data set. This data set contained the following variables needed to perform this analysis:

- Dependent variable: Organized sports participation (participated in at least one sport run by school or community groups within the past 12 months)
- Independent variables: Bully victimization (was bullied on school property during the 12 months before the survey), sexual violence victimization (was physically forced to have sexual intercourse when did not want to), and physical violence victimization (was in a physical fight one or more times during the 12 months before the survey)
- Control variables: Sex, race/ethnicity, and grade

In the following section, I summarize the study results, identify the intrinsic limitations, synthesize the relevant recommendations, and discuss potential opportunities to improve professional practice and promote positive social change.

Summarization of Key Findings

For the specific study variables, 412 (41.5%) respondents reported current organized sports participation. Regarding the independent variables, 303 (30.5%) reported prior bully victimization, 192 (19.4%) reported a history of forced sexual intercourse, and 239 (24.1%) reported prior physical violence victimization.

I performed bivariate analyses using chi-square tests of independence to examine and evaluate associations between sex and each study variable. These analyses

demonstrated a statistically significant relationship between sex and sexual violence victimization (χ^2 (1) = 5.367, p = 0.021) with a weak effect size (0.074). These analyses indicated no statistically significant relationship between sex and sports participation, sex and bully victimization, sex and physical violence victimization, sex and race/ethnicity, or sex and grade.

I also performed chi-square tests of independence to examine associations between sexual orientation and each study variable. These analyses indicated a statistically significant association between sexual orientation and sex, (χ^2 (1) = 63.986, p < 0.001) with a moderate effect size (0.254). There were no statistically significant associations between sexual orientation and sports participation, sexual orientation and bully victimization, sexual orientation and sexual violence victimization, sexual orientation and physical violence victimization, sexual orientation and race/ethnicity, or sexual orientation and grade.

Lastly, I performed chi-square tests of independence to examine associations between the dependent variable, organized sports participation, and each independent and control variable. These analyses determined statistically significant associations between organized sports participation and bully victimization (χ^2 (1) = 3.922, p = 0.048) with a weak effect size (0.063), organized sports participation and sexual violence victimization (χ^2 (1) = 7.921, p = 0.005) with a weak effect size (0.089), and organized sports participation and physical violence victimization (χ^2 (1) = 10.726, p = 0.001) with a weak effect size (0.104). There were no statistically significant associations between organized

sports participation and race, organized sports participation and sex, or organized sports participation and grade.

Multivariate analyses were performed to analyze associations between each independent variable, bully victimization, sexual violence victimization, and physical violence victimization, and the dependent variable, organized sports participation. A two-step hierarchical binomial logistic regression was used to answer the research questions. These analyses demonstrated no statistically significant association between bully victimization and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade. Therefore, the null hypothesis for RQ1 was not rejected.

A subsequent multivariate analysis identified a statistically significant association between sexual violence victimization and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade ($p = 0.003$, 95% CI [1.180-2.243]). Additionally, a statistically significant association was identified between physical violence victimization and organized sports participation among LGB adolescents, when controlling for sex, race/ethnicity, and grade ($p = 0.003$, 95% CI [1.168-2.124]). Therefore, the null hypotheses for RQ2 and RQ3 were rejected.

Interpretation of the Findings

Researchers have reported the high prevalence of ACEs, including bully victimization, sexual violence victimization, and physical violence victimization, and their detrimental health effects, including substance abuse and psychopathology (Basile et al., 2020; Johns et al., 2020; Kammer-Kerwick et al., 2019; Stogner et al., 2021).

Additionally, researchers have demonstrated the protective health effects of organized sports participation, including decreased substance abuse and improved long-term health outcomes (Easterlin et al., 2019; Malm et al., 2019). Unfortunately, sexual minority adolescents are more exposed to ACEs than their heterosexual peers are (Basile et al., 2020; Johns et al., 2020; Kammer-Kerwick et al., 2019; Stogner et al., 2021). In addition, this vulnerable population is less likely to participate in organized sports (Wilson & Cariola, 2020). The relationship between exposure to ACEs and organized sports participation is not well documented, particularly among sexual minority adolescents. Using data from the CDC's 2019 YRBS, this study was conducted to examine the prevalence of organized sports participation, bully victimization, sexual violence victimization, and physical violence victimization among ACE adolescents. Additionally, I examined the associations between these variables.

Prevalence Rates of Adverse Childhood Experiences

The prevalence of bully victimization of sexual minority adolescents has been well studied. Kahle (2017) reported that, in 2007, up to 42% of sexual minority adolescents reported bully victimization, compared to 21% of their heterosexual peers. This number decreased to 32% in 2013 (Kahle, 2020). The results from this study demonstrate a rate of bully victimization of 30.5% among respondents who identified as LGB, demonstrating a slight decrease in bully victimization.

Similarly, the prevalence of sexual violence victimization of sexual minority adolescents has been well documented. Semprevivo (2021) reported a prevalence of 22.2% of sexual minority adolescents reporting sexual violence victimization, compared

to 7.9% of their heterosexual peers, based on data from the 2017 YRBS. The results of the current study demonstrate a rate of sexual violence victimization of 19.4% among respondents who identified as LGB, which represents a decrease.

Lastly, several researchers have reported on the prevalence of physical violence victimization of sexual minority adolescents. For example, Kann et al. (2020) found that 27.9% of ACE students reported being in a physical fight, compared to 23.2% of their heterosexual peers, based on the 2017 YRBS. The results from this study demonstrate a rate of physical violence victimization of 24.1% among respondents who identified as LGB, indicating a decrease from 2017.

Prevalence Rates of Organized Sports Participation

Researchers have reported that LGBTQ adolescents participate in organized sports at lower rates than their heterosexual peers do. For example, Clark et al. (2021) reported that only 19.2% of LGBTQ adolescents participated in interscholastic sports, compared to 40.2% of their heterosexual peers. Additionally, only 15.9% of LGBTQ adolescents participated in intramural sports, compared to 35.8% of heterosexual adolescents (Clark et al., 2021). The results of the current study indicate a prevalence rate of organized sports participation of 41.5%, markedly higher than previously reported estimates.

Relevant Associations Between Variables

In this study, the results demonstrated a statistically significant relationship between organized sports participation and bully victimization ($\chi^2(1) = 3.922$, $p = 0.048$) with a weak effect size (0.063), organized sports participation and sexual violence

victimization ($\chi^2(1) = 7.921$, $p = 0.005$) with a weak effect size (0.089), and organized sports participation and physical violence victimization ($\chi^2(1) = 10.726$, $p = 0.001$) with a weak effect size (0.104). Additionally, binomial logistic regression identified that individuals who reported a history of sexual violence victimization were 1.6 times more likely to participate in sports. Similarly, respondents who reported physical violence victimization within the past 12 months were 1.5 times more likely to participate in organized sports. This is contrary to prior reported data, which demonstrated that ACE victimization is associated with reduced odds of sports participation (Noel-London et al., 2021).

Limitations of the Study

Several inherent limitations must be considered when examining the associations between ACEs and organized sports participation among LGB respondents to the CDC's 2019 YRBS. The primary limitation is the usage of secondary data to perform this analysis. The data utilized for this study was collected exclusively for the CDC's 2019 YRBS and was not primary data for the purposes of this analysis. Trinh (2018) reported that bias could limit secondary data analysis, resulting in incorrect observational assumptions inferring causality. Several efforts were made to mitigate threats to internal validity, including the use of a comprehensive survey design that assessed multiple aspects of adolescent health, the anonymous and voluntary nature of the survey responses, and the single time point administration, which prevented concerns of maturation and testing bias (Underwood et al., 2020). Despite these efforts, selection bias may have persisted (Trinh, 2018). Moreover, Chen et al. (2021) reported that the CDC's

2019 YRBS could be influenced by recall and social desirability bias, resulting in under/overreporting. Specifically, while the CDC's 2019 YRBS was administered to public and private schools throughout the US, it does not capture data from students who attend vocational schools or alternative schools, limiting its generalizability to all LGB adolescents (Underwood et al., 2020).

A second limitation of this study is its applicability to all ACEs. Specifically, this analysis of associations between ACEs and organized sports participation is limited to the available variables found in the CDC's 2019 YRBS data set (Chen et al., 2021). Additionally, the aggregation of data under the umbrella variable of LGB does not account for variations in victimization (Semprevivo, 2021). Additionally, Srivastava et al. (2023) noted that sexual identity is evolving during the formative years of adolescence; therefore, this can result in under/overrepresenting in the study results. Furthermore, this analysis is limited by its quantitative study design and the absence of narrative data to help identify themes and insight into the impacts of ACEs (Semprevivo, 2021).

The third limitation of this study is its inability to determine the accuracy of self-reported data by the survey participants. While the YRBS questions underwent test-retest reliability, self-reported data about ACEs can be susceptible to recall bias (Kelly-Irving & Delpierre, 2019). Lastly, a cross-sectional study cannot be used to explain or determine causation between the study variables (Wang & Cheng, 2020).

Recommendations

The results of this study serve as the foundation for several opportunities for future research. First, the study design and analysis methods used for this study can be

replicated utilizing prior and future CDC YRBS data sets. This may allow for continued examination and identification of trends and differences in associations between ACEs and organized sports participation among LGB adolescents. Moreover, this may allow researchers to evaluate the effects of efforts to increase access to organized sports for this vulnerable population.

Second, the study design and analysis methods could be used to examine other forms of adverse experiences captured in the CDC YRBS data set, including electronic bullying, history of being threatened while on school campus, history of being threatened with a gun, and history of intimate partner violence. Examining other variables may yield differing results. As such, further research is needed to examine the intricate relationships between these variables and their associations with organized sports participation.

Lastly, the study design and analysis methods could be replicated utilizing a different study cohort. This study included respondents who identified as lesbian, gay, or bisexual. Further research should be performed to expand this cohort to include those who reported they were not sure of their sexual identify, who are categorized by the CDC YRBS data set as *other/questioning*. As noted by Srivastava et al. (2023), sexual and gender identities evolve throughout the formative years of adolescence. As such, expanding the cohort to include those who may be questioning their sexual identity may provide a more nuanced understanding of the interplay between these variables.

Implications for Professional Practice and Social Change

The associations between ACE victimization and organized sports participation have not been well-documented, specific to sexual minority adolescents. In addition, few

researchers have investigated the interplay between these variables within this population. The emerging research presented in this study serves as the catalyst for multiple opportunities to improve professional practice and promote positive social change.

Implications for Professional Practice

This study is significant in that it investigated the associations between ACEs and organized sports participation among sexual minority adolescents, which is limited in the current literature. Proper training on ACEs is crucial for current and future healthcare and school counseling providers (Onigue-Otite & Idicula, 2020). Developing foundational and continuing education curricula informed by the findings of this study can have multiple implications for various professional sectors, including medical, academic, and community-based settings.

The findings of this study may facilitate more informed healthcare delivery. By knowing the prevalence of ACEs among sexual minority adolescents, healthcare providers can be better prepared to address the often-nuanced external factors that may impact adolescent health. Moreover, the results of this study align with the tenet of trauma-informed care, which promotes the concepts of raising patient self-awareness, engagement in prevention services, encouraging self-efficacy, and influencing motivations for change (Mersky et al., 2019). Integrating trauma-informed care models, informed by epidemiologic metrics reported in this study, may improve healthcare experiences and outcomes (Roberts et al., 2019). As such, the findings of this study may

provide a helpful framework to support these efforts to promote trauma-informed care, particularly to sexual minority adolescents.

The interplay between ACEs and organized sports participation identified in this study may also promote prevention and early intervention strategies in academic settings. Alvarez et al. (2022) reported that school counselors are well-positioned to recognize trauma victimization, provide vital resources, and implement school-based programming. Providing professional training programs to school counselors, informed by this study, may help develop better screening tools to facilitate early intervention and prevention strategies. Furthermore, the results of this study may help in the development of comprehensive school counseling programs and the implementation of multi-tiered systems of support needed to assist this vulnerable population.

Lastly, the findings of this study may support efforts to promote trauma-informed physical activity programs, particularly high school sports. Darroch et al. (2020) noted that trauma-informed physical activity programming acknowledges the effects of trauma and accounts for its impact on program design and delivery. Darroch et al. (2020) additionally reported that organized sports training is often delivered with a *dominant* approach, as the coach acts as the sole individual who dictates the activities of their athletes. This *dominant* status, in addition to any physical contact required by the sport, can potentially be re-traumatizing (Darroch et al., 2020). Therefore, it is integral to develop educational programming, informed by this study, to help high school administrators, coaches, and physical education teachers promote physical activity and organized sports among sexual minority adolescents.

Implications for Positive Social Change

The results of this study present several avenues to promote meaningful and positive social change. Peer discrimination and inaction of school athletic leadership have been cited as barriers to organized sports participation among sexual minority adolescents (Denison et al., 2020a; Greenspan et al., 2019). At the individual level, this study may help inform sexual minority adolescent perceptions of the barriers to and benefits of organized sports participation, and the severity of and susceptibility to substance abuse and poor health outcomes. Clark and Kosciw (2021) noted that sexual minority youth who participated in sports reported increased wellness and greater school belonging. The findings of this study may encourage sexual minority adolescents to consider organized sports participation.

At the organizational level, this study may foster collaboration between school district leadership and healthcare systems that prioritize the development of comprehensive public health programming to combat the effects of ACE victimization among high-risk groups. Naranjo-Rivera (2020) reported on the benefits of programming, such as the Peace In Schools mindfulness course program, noting that school-based interventions provide an accessible and effective way to address adolescent mental health and trauma among vulnerable populations. Key stakeholders within academia and healthcare may use this study as a foundation to inform programming specific to their student population.

Lastly, the findings of this study may be used to promote positive social change at a policy level. Denison et al. (2020b) reported that despite funding efforts to promote

demographic diversity in sports, limited funding has been allocated to promote sports participation among sexual minority youth. The authors called for policymakers to advocate for improved inclusion of this population and facilitate the end of discriminatory behaviors (Denison et al., 2020b). As such, the results of the current study may help inform future community, state, and federal advocacy efforts to promote inclusive policies and opportunities for sexual minority adolescents.

Conclusion

High-risk health behaviors, ACE victimization, and psychopathology are highly prevalent among sexual minority adolescents. These public health issues, combined with the inherent difficulties associated with the formative years of adolescence, can result in lifelong poor health outcomes. While organized sports participation has been frequently cited as a reliable avenue to foster long-term health and improve mental health, participation rates among sexual minority adolescents are disproportionately low compared to heterosexual adolescents. While prior researchers have identified barriers, including peer discrimination, little to no research describes the associations between ACEs and organized sports participation among sexual minority adolescents. This study was the first to examine the associations between self-reported ACEs, including bully victimization, sexual violence victimization, and physical violence victimization, and organized sports participation among sexual minority adolescents. The results of this study demonstrated statistically significant associations between ACE victimization and organized sports participation among ACE adolescents, when controlling for sex, race/ethnicity, and grade. The results of this study may serve as the foundational

framework for future research to explore associations between other forms of ACE victimization and organized sports participation. Lastly, this study may facilitate cross-sector collaboration among public health, medical, academic, and community stakeholders, to promote organized sports participation among this vulnerable population.

References

Alvarez, J. M., Saunders, R., Neubauer, E., & Brown, C. H. (2022). School counselors implementing a trauma-informed approach through evidence-based practices. *Professional School Counseling*, *26*(1a). https://doi.org/10.1177/2156759x221086742

Amos, R., Manalastas, E. J., White, R., Bos, H., & Patalay, P. (2020). Mental health, social adversity, and health-related outcomes in sexual minority adolescents: A contemporary national cohort study. *The Lancet Child & Adolescent Health*, *4*(1), 36–45. https://doi.org/10.1016/s2352-4642(19)30339-6

Angoff, H. D., & Barnhart, W. R. (2021). Bullying and cyberbullying among LGBQ and heterosexual youth from an intersectional perspective: Findings from the 2017 national youth risk behavior survey. *Journal of School Violence*, *20*(3), 274–286. https://doi.org/10.1080/15388220.2021.1879099

Armitage, R. (2021). Bullying in children: Impact on child health. *BMJ Paediatrics Open*, *5*(1). https://doi.org/10.1136/bmjpo-2020-000939

Baiden, P., Xiao, Y., Asiedua-Baiden, G., LaBrenz, C. A., Boateng, G. O., Graaf, G., & Muehlenkamp, J. J. (2020). Sex differences in the association between sexual violence victimization and suicidal behaviors among adolescents. *Journal of Affective Disorders Reports*, *1*, 100011. https://doi.org/10.1016/j.jadr.2020.100011

Basile, K. C., Clayton, H. B., DeGue, S., Gilford, J. W., Vagi, K. J., Suarez, N. A., Zwald, M. L., & Lowry, R. (2020). Interpersonal violence victimization among

high school students — youth risk behavior survey, United States, 2019. *MMWR Supplements*, *69*(1), 28–37. https://doi.org/10.15585/mmwr.su6901a4

Berndt, A. E. (2020). Sampling methods. *Journal of Human Lactation*, *36*(2), 224–226. https://doi.org/10.1177/0890334420906850

Camodeca, M., & Nava, E. (2020). The long-term effects of bullying, victimization, and bystander behavior on emotion regulation and its physiological correlates. *Journal of Interpersonal Violence*, *37*(3–4). https://doi.org/10.1177/0886260520934438

Centers for Disease Control and Prevention. (2019). *#Stopbullying*. Retrieved February 2, 2023, from https://www.cdc.gov/injury/features/stop-bullying/index.html

Centers for Disease Control and Prevention. (2020a). *YRBSS results*. Retrieved January 10, 2023, from https://www.cdc.gov/healthyyouth/data/yrbs/results.htm

Centers for Disease Control and Prevention. (2020b). *Physical activity: Why it matters*. Retrieved January 29, 2023, from https://www.cdc.gov/physicalactivity/about-physical-activity/why-it-matters.html

Centers for Disease Control and Prevention. (2020c). *YRBSS methods*. Retrieved March 8, 2023, from https://www.cdc.gov/healthyyouth/data/yrbs/methods.htm

Centers for Disease Control and Prevention. (2020d). *Guide to conducting your own youth risk behavior survey*. Retrieved March 12, 2023, from https://www.cdc.gov/healthyyouth/data/yrbs/pdf/2019/2019_yrbs_conducting_your_own.pdf

Centers for Disease Control and Prevention. (2021a). *YRBSS Data Summary & Trends*. Retrieved February 3, 2023, from

https://www.cdc.gov/healthyyouth/data/yrbs/yrbs_data_summary_and_trends.htm

Centers for Disease Control and Prevention. (2021b). *Violence impacts teens' lives*. Retrieved February 5, 2023, from https://www.cdc.gov/injury/features/teen-violence-impact/index.html

Centers for Disease Control and Prevention. (2022a). *Childhood obesity facts*. Retrieved January 10, 2023, from https://www.cdc.gov/obesity/data/childhood.html

Centers for Disease Control and Prevention. (2022b). *High risk substance use in youth*. Retrieved January 10, 2023, from https://www.cdc.gov/healthyyouth/substance-use/index.htm

Centers for Disease Control and Prevention. (2022c). *Fast facts: Preventing adverse childhood experiences*. Retrieved February 1, 2023, from https://www.cdc.gov/violenceprevention/aces/fastfact.html

Centers for Disease Control and Prevention. (2022d). *Preventing child sexual abuse*. Retrieved February 4, 2023, from https://www.cdc.gov/violenceprevention/childsexualabuse/fastfact.html

Centers for Disease Control and Prevention. (2022e). *YRBSS data & documentation*. Retrieved March 12, 2023, from https://www.cdc.gov/healthyyouth/data/yrbs/data.htm

Charles, N. E., Strong, S. J., Floyd, P. N., Burns, L. C., Sigurdson, L., & Barry, C. T. (2022). Test-retest reliability of self-reported substance use and sexual risk behavior among at-risk adolescents. *Psychological Reports*, 003329412211004. https://doi.org/10.1177/00332941221100459

Clark, C. M., & Kosciw, J. G. (2021). Engaged or excluded: LGBTQ youth's participation in school sports and their relationship to psychological well-being. *Psychology in the Schools*, *59*(1), 95–114. https://doi.org/10.1002/pits.22500

Clements, J. M. (2020). Knowledge and behaviors toward covid-19 among us residents during the early days of the pandemic: Cross-sectional online questionnaire. *JMIR Public Health and Surveillance*, *6*(2). https://doi.org/10.2196/19161

Chen, T. J., Watson, K. B., Michael, S. L., & Carlson, S. A. (2021). Sex-stratified trends in meeting physical activity guidelines, participating in sports, and attending Physical Education among us adolescents, youth risk behavior survey 2009–2019. *Journal of Physical Activity and Health*, *18*(S1). https://doi.org/10.1123/jpah.2021-0263

Chun, J. S., Lee, J., Kim, J., & Lee, S. (2020). An international systematic review of cyberbullying measurements. *Computers in Human Behavior*, *113*, 106485. https://doi.org/10.1016/j.chb.2020.106485

Darroch, F. E., Roett, C., Varcoe, C., Oliffe, J. L., & Gonzalez Montaner, G. (2020). Trauma-informed approaches to physical activity: A scoping study. *Complementary Therapies in Clinical Practice*, *41*, 101224. https://doi.org/10.1016/j.ctcp.2020.101224

Data Resource Center for Child & Adolescent Health [DRCCAH]. (2023) *Survey results*. NSCH 2019: Participation in sports teams or sports lessons after school or on weekends, Nationwide. Retrieved January 29, 2023, from https://www.childhealthdata.org/browse/survey/results?q=8071&r=1

Denison, E., Jeanes, R., Faulkner, N., & O'Brien, K. S. (2020a). The relationship between 'coming out' as lesbian, gay, or bisexual and experiences of homophobic behaviour in youth team sports. *Sexuality Research and Social Policy*, *18*(3), 765–773. https://doi.org/10.1007/s13178-020-00499-x

Denison, E., Bevan, N., & Jeanes, R. (2020). Reviewing evidence of LGBTQ+ discrimination and exclusion in sport. *Sport Management Review*, *24*(3), 389–409. https://doi.org/10.1016/j.smr.2020.09.003

Doull, M., Watson, R. J., Smith, A., Homma, Y., & Saewyc, E. (2018). Are we leveling the playing field? trends and disparities in sports participation among sexual minority youth in Canada. *Journal of Sport and Health Science, 7*(2), 218–226. https://doi.org/10.1016/j.jshs.2016.10.006

Easterlin, M. C., Chung, P. J., Leng, M., & Dudovitz, R. (2019). Association of Team Sports Participation with long-term mental health outcomes among individuals exposed to adverse childhood experiences. *JAMA Pediatrics*, 173(7), 681. https://doi.org/10.1001/jamapediatrics.2019.1212

Eckstrand, K. L., Flores Jr., L. E., Cross, M., Silk, J. S., Allen, N. B., Healey, K. L., Marshal, M. P., & Forbes, E. E. (2019). Social and non-social reward processing and depressive symptoms among sexual minority adolescents. *Frontiers in Behavioral Neuroscience, 13*. https://doi.org/10.3389/fnbeh.2019.00209

Elghossain, T., Bott, S., Akik, C., Ghattas, H., & Obermeyer, C. M. (2019). Prevalence of key forms of violence against adolescents in the Arab Region: A systematic review. *Journal of Adolescent Health*, *64*(1), 8–19.

https://doi.org/10.1016/j.jadohealth.2018.08.016

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (2019). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, *56*(6), 774–786. https://doi.org/10.1016/j.amepre.2019.04.001

Fix, R. L., Nava, N., & Rodriguez, R. (2021). Disparities in adolescent dating violence and associated internalizing and externalizing mental health symptoms by gender, race/ethnicity, and sexual orientation. *Journal of Interpersonal Violence*, *37*(17-18). https://doi.org/10.1177/0886260521997944

Gabriel, E. H., Hoch, M. C., & Cramer, R. J. (2019). Health belief model scale and theory of planned behavior scale to assess attitudes and perceptions of injury prevention program participation: An exploratory factor analysis. *Journal of Science and Medicine in Sport*, *22*(5), 544–549. https://doi.org/10.1016/j.jsams.2018.11.004

Galán, C. A., Stokes, L. R., Szoko, N., Abebe, K. Z., & Culyba, A. J. (2021). Exploration of experiences and perpetration of identity-based bullying among adolescents by race/ethnicity and other marginalized identities. *JAMA Network Open*, *4*(7). https://doi.org/10.1001/jamanetworkopen.2021.16364

Gewirtz-Meydan, A. (2020). The relationship between child sexual abuse, self-concept and psychopathology: The moderating role of social support and perceived parental quality. *Children and Youth Services Review*, *113*, 104938. https://doi.org/10.1016/j.childyouth.2020.104938

Gewirtz-Meydan, A., & Finkelhor, D. (2019). Sexual abuse and assault in a large national sample of children and adolescents. *Child Maltreatment*, *25*(2), 203–214. https://doi.org/10.1177/1077559519873975

Goldbach, J. T., Raymond, H. F., & Burgess, C. M. (2017). Patterns of bullying behavior by sexual orientation. *Journal of Interpersonal Violence*, *36*(3-4), 1189–1207. https://doi.org/10.1177/0886260517741623

Green, E. C., Murphy, E. M., & Gryboski, K. (2020). The health belief model. *The Wiley Encyclopedia of Health Psychology*, 211–214. https://doi.org/10.1002/9781119057840.ch68

Greenspan, S. B., Griffith, C., Hayes, C. R., & Murtagh, E. F. (2019). LGBTQ + and ally youths' school athletics perspectives: A mixed-method analysis. *Journal of LGBT Youth*, *16*(4), 403–434. https://doi.org/10.1080/19361653.2019.1595988

Hayden, J. (2019). *Introduction to health behavior theory* (3rd ed.). Burlington, MA: Jones & Bartlett Learning.

Hailes, H. P., Yu, R., Danese, A., & Fazel, S. (2019). Long-term outcomes of childhood sexual abuse: An umbrella review. *The Lancet Psychiatry*, *6*(10), 830–839. https://doi.org/10.1016/s2215-0366(19)30286-x

Halliday, S., Gregory, T., Taylor, A., Digenis, C., & Turnbull, D. (2021). The impact of bullying victimization in early adolescence on subsequent psychosocial and academic outcomes across the adolescent period: A systematic review. *Journal of School Violence*, *20*(3), 351–373. https://doi.org/10.1080/15388220.2021.1913598

Harris, J. K. (2021). Primer on binary logistic regression. *Family Medicine and Community Health*, *9*(Suppl 1). https://doi.org/10.1136/fmch-2021-001290

Herbert, C., Meixner, F., Wiebking, C., & Gilg, V. (2020). Regular physical activity, short-term exercise, mental health, and well-being among university students: The results of an online and a laboratory study. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.00509

Heslin, K. C., & Hall, J. E. (2021). Sexual orientation disparities in risk factors for adverse COVID-19–related outcomes, by race/ethnicity — behavioral risk factor surveillance system, United States, 2017–2019. *MMWR. Morbidity and Mortality Weekly Report*, *70*(5), 149–154. https://doi.org/10.15585/mmwr.mm7005a1

Hilbe, J. (2016a). *Practical guide to logistic regression*. CRC Press. Hyde, E. T., Omura, J. D., Fulton, J. E., Lee, S. M., Piercy, K. L., & Carlson, S. A. (2020). Disparities in youth sports participation in the U.S., 2017–2018. *American Journal of Preventive Medicine*, *59*(5). https://doi.org/10.1016/j.amepre.2020.05.011

IBM. (2023). *SPSS statistics - overview*. IBM. Retrieved March 12, 2023, from https://www.ibm.com/products/spss-statistics

Kahle, L. (2017). Are sexual minorities more at risk? bullying victimization among lesbian, gay, bisexual, and questioning youth. *Journal of Interpersonal Violence*, *35*(21–22), 4960–4978. https://doi.org/10.1177/0886260517718830

Kammer-Kerwick, M., Wang, A., McClain, T. S., Hoefer, S., Swartout, K. M., Backes, B., & Busch-Armendariz, N. (2019). Sexual violence among gender and sexual minority college students: The risk and extent of victimization and related health

and educational outcomes. *Journal of Interpersonal Violence*, *36*(21-22), 10499–10526. https://doi.org/10.1177/0886260519883866

Kahle, L. (2017). Are sexual minorities more at risk? bullying victimization among lesbian, gay, bisexual, and questioning youth. *Journal of Interpersonal Violence*, *35*(21–22), 4960–4978. https://doi.org/10.1177/0886260517718830

Kelly-Irving, M., & Delpierre, C. (2019). A critique of the adverse childhood experiences framework in Epidemiology and Public Health: Uses and misuses. *Social Policy and Society*, *18*(3), 445–456. https://doi.org/10.1017/s1474746419000101

Kemal, O. (2020). Power analysis and sample size, when and why? *Turkish Archives of Otorhinolaryngology*, *58*(1), 3–4. https://doi.org/10.5152/tao.2020.0330

Kilicheva, K., & Klicheva, G. (2020). What are the effects of bullying among school children? *The American Journal of Social Science and Education Innovations*, *02*(10), 422–426. https://doi.org/10.37547/tajssei/volume02issue10-68

Kokkonen, M. (2019). Associations between sexual and gender-based harassment by a coach and psychological ill-being amongst gender and sexual minority sport participants in Finland. *Journal of Clinical Sport Psychology*, *13*(2), 259–273. https://doi.org/10.1123/jcsp.2018-0035

Kreski, N. T., Chen, Q., Olfson, M., Cerdá, M., Martins, S. S., Mauro, P. M., Hasin, D. S., & Keyes, K. M. (2022). National Trends and disparities in bullying and suicidal behavior across demographic subgroups of us adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *61*(12), 1435–1444. https://doi.org/10.1016/j.jaac.2022.04.011

Knoester, C., & Allison, R. (2021). Sexuality, sports-related mistreatment, and U.S. adults' sports involvement. *Leisure Sciences*, 1–23. https://doi.org/10.1080/01490400.2021.1895009

Kulick, A., Wernick, L. J., Espinoza, M. A., Newman, T. J., & Dessel, A. B. (2018). Three strikes and you're out: Culture, facilities, and participation among LGBTQ youth in Sports. *Sport, Education and Society*, *24*(9), 939–953. https://doi.org/10.1080/13573322.2018.1532406

Lebrun-Harris, L. A., Sherman, L. J., & Miller, B. (2020). State-level prevalence of bullying victimization among children and adolescents, National Survey of Children's Health, 2016-2017. *Public Health Reports*, *135*(3), 303–309. https://doi.org/10.1177/0033354920912713

Logan, K., Cuff, S., LaBella, C. R., Brooks, M. A., Canty, G., Diamond, A. B., Hennrikus, W., Moffatt, K., Nemeth, B. A., Pengel, K. B., Peterson, A. R., & Stricker, P. R. (2019). Organized sports for children, Preadolescents, and adolescents. *Pediatrics*, *143*(6). https://doi.org/10.1542/peds.2019-0997

Malm, C., Jakobsson, J., & Isaksson, A. (2019). Physical activity and sports—real health benefits: A review with insight into the public health of Sweden. *Sports*, 7(5), 127. https://doi.org/10.3390/sports7050127

Manheim, M., Felicetti, R., & Moloney, G. (2019). Child sexual abuse victimization prevention programs in preschool and kindergarten: Implications for practice. *Journal of Child Sexual Abuse*, *28*(6), 745–757. https://doi.org/10.1080/10538712.2019.1627687

Mathews, B., & Collin-Vézina, D. (2019). Child sexual abuse: Toward a conceptual model and definition. *Trauma, Violence, & Abuse*, *20*(2), 131–148. https://doi.org/10.1177/1524838017738726

McArthur, L. H., Riggs, A., Uribe, F., & Spaulding, T. J. (2018). Health belief model offers opportunities for designing weight management interventions for college students. *Journal of Nutrition Education and Behavior*, *50*(5), 485–493. https://doi.org/10.1016/j.jneb.2017.09.010

Medina-Martínez, J., Saus-Ortega, C., Sánchez-Lorente, M. M., Sosa-Palanca, E. M., García-Martínez, P., & Mármol-López, M. I. (2021). Health inequities in LGBT people and nursing interventions to reduce them: A systematic review. *International Journal of Environmental Research and Public Health*, *18*(22), 11801. https://doi.org/10.3390/ijerph182211801

Méndez, I., Jorquera, A. B., Ruiz-Esteban, C., Martínez-Ramón, J. P., & Fernández-Sogorb, A. (2019). Emotional intelligence, bullying, and cyberbullying in adolescents. *International Journal of Environmental Research and Public Health*, *16*(23), 4837. https://doi.org/10.3390/ijerph16234837

Menzel, T., Braumüller, B., & Hartmann-Tews, I. (2019). The relevance of sexual orientation and gender identity in sport in Europe. *Findings from the Outsport survey. Cologne: German Sport University Cologne, Institute of Sociology and Gender Studies*.

Merrick, M. T., Ford, D. C., Ports, K. A., Guinn, A. S., Chen, J., Klevens, J., Metzler, M., Jones, C. M., Simon, T. R., Daniel, V. M., Ottley, P., & Mercy, J. A. (2019). *Vital*

signs: estimated proportion of adult health problems attributable to adverse childhood experiences and implications for prevention — 25 states, 2015–2017. *MMWR. Morbidity and Mortality Weekly Report*, *68*(44), 999–1005. https://doi.org/10.15585/mmwr.mm6844e1

Mersky, J. P., Topitzes, J., & Britz, L. (2019). Promoting evidence-based, trauma-informed Social Work Practice. *Journal of Social Work Education*, *55*(4), 645–657. https://doi.org/10.1080/10437797.2019.1627261

Misiak, B., Stańczykiewicz, B., Pawlak, A., Szewczuk-Bogusławska, M., Samochowiec, J., Samochowiec, A., Tyburski, E., & Juster, R.-P. (2022). Adverse childhood experiences and low socioeconomic status with respect to allostatic load in adulthood: A systematic review. *Psychoneuroendocrinology*, *136*, 105602. https://doi.org/10.1016/j.psyneuen.2021.105602

Naranjo-Rivera, G. (2020). *The adverse childhood experiences (ACEs), mindfulness, and adolescent (AMA) health study: Addressing health and well-being in schools and advancing the science of social justice in public health and education* (dissertation). John Hopkins, Baltimore, MD.

National Center for Education Statistics. (2022). Physical Fights on School Property and Anywhere. *Condition of Education*. U.S. Department of Education, Institute of Education Sciences. Retrieved, Retrieved February 1, 2023, from https://nces.ed.gov/programs/coe/indicator/a12.

National Federation of State High School Associations. (2022). 2021-2022 High School Athletics Participation Survey. Indianapolis; National Federation of State High

School Associations.

Naqvi, M., Li, L., Woodrow, M., Yadav, P., & Kostkova, P. (2022). Understanding covid-19 vaccine hesitancy in ethnic minorities groups in the UK. *Frontiers in Public Health, 10*. https://doi.org/10.3389/fpubh.2022.917242

Noel-London, K., Ortiz, K., & BeLue, R. (2021). Adverse childhood experiences (ACES) & youth sports participation: Does a gradient exist? *Child Abuse & Neglect, 113*, 104924. https://doi.org/10.1016/j.chiabu.2020.104924

Noll, J. G. (2021). Child sexual abuse as a unique risk factor for the development of psychopathology: The compounded convergence of mechanisms. *Annual Review of Clinical Psychology*, *17*(1), 439–464. https://doi.org/10.1146/annurev-clinpsy-081219-112621

Jahanfar, S., Okafor, C., Inungu, J., & Minelli, M. (2020). The relationship between bullying, sexual violence and substance use among adolescents in the United States: Cross-sectional study. *European Journal of Environment and Public Health*, *4*(2). https://doi.org/10.29333/ejeph/8329

Onigu-Otite, E., & Idicula, S. (2020). Introducing aces (adverse childhood experiences) and resilience to first-year medical students. *MedEdPORTAL*. https://doi.org/10.15766/mep_2374-8265.10964

Project Play. (2023). State of play: Our annual report on trends in youth sports. Washington D.C.; Aspen Institute.

Rahman, M. M., Rahman, M. M., Khan, M. M., Hasan, M., & Choudhury, K. N. (2020). Bullying victimization and adverse health behaviors among school-going

adolescents in South Asia: Findings from the global school-based student health survey. *Depression and Anxiety*, *37*(10), 995–1006. https://doi.org/10.1002/da.23033

Rapoport, E., Athanasian, C. E., & Adesman, A. (2021). Prevalence of nonheterosexual identity and same-sex sexual contact among high school students in the US from 2015 to 2019. *JAMA Pediatrics*, *175*(9), 970. https://doi.org/10.1001/jamapediatrics.2021.1109

Roback, P., & Legler, J. (2021). *Beyond multiple linear regression: applied generalized linear models and multilevel models in R*. CRC Press.

Roberts, S. J., Chandler, G. E., & Kalmakis, K. (2019). A model for trauma-informed primary care. *Journal of the American Association of Nurse Practitioners*, *31*(2), 139–144. https://doi.org/10.1097/jxx.0000000000000116

Rosenstock, I. M. (1974). The health belief model and preventive health behavior. *Health Education Monographs*, *2*(4), 354–386. https://doi.org/10.1177/109019817400200405

Runarsdottir, E., Smith, E., & Arnarsson, A. (2019). The effects of gender and family wealth on sexual abuse of adolescents. *International Journal of Environmental Research and Public Health*, *16*(10), 1788. https://doi.org/10.3390/ijerph16101788

Saghafi-Asl, M., Aliasgharzadeh, S., & Asghari-Jafarabadi, M. (2020). Factors influencing weight management behavior among college students: An application of the health belief model. *PLOS ONE*, *15*(2).

https://doi.org/10.1371/journal.pone.0228058

Semprevivo, L. K. (2020). Dating and sexual violence victimization among lesbian, gay, bisexual, and questioning youth: Considering the importance of gender and sexual orientation. *Journal of Aggression, Maltreatment & Trauma*, *30*(5), 662–678. https://doi.org/10.1080/10926771.2020.1832175

Scheer, J. R., McConocha, E., Behari, K., & Pachankis, J. E. (2019). Sexual violence as a mediator of sexual orientation disparities in alcohol use, suicidality, and sexual-risk behaviour among female youth. *Psychology & Sexuality*, *12*(1-2), 37–51. https://doi.org/10.1080/19419899.2019.1690031

Schwab-Reese, L. M., Currie, D., Mishra, A. A., & Peek-Asa, C. (2018). A comparison of violence victimization and polyvictimization experiences among sexual minority and heterosexual adolescents and Young Adults. *Journal of Interpersonal Violence*, *36*(11-12). https://doi.org/10.1177/0886260518808853

Sharp, A., Young, M. S., & Moore, K. A. (2019). Relationship between substance use, bullying, and other delinquent behaviors among high school students: A secondary analysis of the Florida Youth Substance Abuse Survey. *The Journal of Behavioral Health Services & Research*, *46*(4), 570–585. https://doi.org/10.1007/s11414-019-09649-5

Shull, E. R., Dowda, M., Saunders, R. P., McIver, K., & Pate, R. R. (2020). Sport participation, physical activity and sedentary behavior in the transition from middle school to high school. *Journal of Science and Medicine in Sport*, *23*(4), 385–389. https://doi.org/10.1016/j.jsams.2019.10.017

Sim, J., & Waterfield, J. (2019). Focus Group methodology: Some ethical challenges. *Quality & Quantity*, *53*(6), 3003–3022. https://doi.org/10.1007/s11135-019-00914-5

Spector, P. E. (2019). Do not cross me: Optimizing the use of cross-sectional designs. *Journal of Business and Psychology*, *34*(2), 125–137. https://doi.org/10.1007/s10869-018-09613-8

Srivastava, A., Hall, W. J., Krueger, E. A., & Goldbach, J. T. (2023). Sexual identity fluidity, identity management stress, and depression among sexual minority adolescents. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.1075815

Stogner, J., Sarvey, L., Lowe, C. C., Hupli, A., & Miller, B. L. (2021). Sexual orientation and synthetic cannabinoid use: Examining the role of bullying victimization. *Journal of Psychoactive Drugs*, *54*(4), 368–377. https://doi.org/10.1080/02791072.2021.1972186

Stoltzfus, J. C. (2011). Logistic regression: A brief primer. *Academic Emergency Medicine*, 18(10), 1099–1104. https://doi.org/10.1111/j.1553-2712.2011.01185.x

Strathearn, L., Giannotti, M., Mills, R., Kisely, S., Najman, J., & Abajobir, A. (2020). Long-term cognitive, psychological, and health outcomes associated with Child abuse and neglect. *Pediatrics*, *146*(4). https://doi.org/10.1542/peds.2020-0438

Taylor, S., & Xia, Y. (2020). Dating violence among rural adolescents: Perpetration and victimization by gender. *Journal of Interpersonal Violence*, *37*(9-10). https://doi.org/10.1177/0886260520971613

Trinh, Q.-D. (2018). Understanding the impact and challenges of secondary data analysis. *Urologic Oncology: Seminars and Original Investigations*, *36*(4), 163–164. https://doi.org/10.1016/j.urolonc.2017.11.003

Underwood, J. M., Brener, N., Thornton, J., Harris, W. A., Bryan, L. N., Shanklin, S. L., Deputy, N., Roberts, A. M., Queen, B., Chyen, D., Whittle, L., Lim, C., Yamakawa, Y., Leon-Nguyen, M., Kilmer, G., Smith-Grant, J., Demissie, Z., Jones, S. E., Clayton, H., & Dittus, P. (2020). Overview and methods for the youth risk behavior surveillance system — United States, 2019. *MMWR Supplements*, *69*(1), 1–10. https://doi.org/10.15585/mmwr.su6901a1

*Universität Düsseldorf: G*Power*. (2023). G*Power. Retrieved March, 12, 2023, from https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower.html

Uttley, J. (2019). Power analysis, Sample Size, and assessment of statistical assumptions—improving the evidential value of lighting research. *LEUKOS*, *15*(2-3), 143–162. https://doi.org/10.1080/15502724.2018.1533851

Várnai, D. E., Horváth, Z., Jármi, É., Urbán, R., Demetrovics, Z., Németh, Á., & Kökönyei, G. (2020). Empirically based classification of peer violence in a nationally representative sample of adolescents: A latent class analysis. *International Journal of Mental Health and Addiction*, *19*(5), 1745–1758. https://doi.org/10.1007/s11469-020-00260-w

Vitoroulis, I., & Vaillancourt, T. (2018). Ethnic group differences in bullying perpetration: A meta-analysis. *Journal of Research on Adolescence*, *28*(4), 752–

771. https://doi.org/10.1111/jora.12393

Walden University. (2023). *Academic guides: Student research support: Quantitative, SPSS, and Statistics Tutoring*. Quantitative, SPSS, and statistics tutoring - Student Research Support - Academic Guides at Walden University. Retrieved March 12, 2023, from https://academicguides.waldenu.edu/research-center/student-research/spss-statistics

Wang, X., & Cheng, Z. (2020). Cross-sectional studies: Strengths, weaknesses, and recommendations. *Chest*, *158*(1). https://doi.org/10.1016/j.chest.2020.03.012

Watson, A., & Koontz, J. S. (2020). Youth sports in the wake of COVID-19: A call for change. *British Journal of Sports Medicine*, *55*(14), 764–764. https://doi.org/10.1136/bjsports-2020-103288

Webb, L., Clary, L. K., Johnson, R. M., & Mendelson, T. (2021). Electronic and school bullying victimization by race/ethnicity and sexual minority status in a nationally representative adolescent sample. *Journal of Adolescent Health*, *68*(2), 378–384. https://doi.org/10.1016/j.jadohealth.2020.05.042

Wiium, N., & Säfvenbom, R. (2019). Participation in organized sports and self-organized physical activity: Associations with developmental factors. *International Journal of Environmental Research and Public Health*, *16*(4), 585. https://doi.org/10.3390/ijerph16040585

Wilson, C., & Cariola, L. A. (2020). LGBTQI+ youth and mental health: A systematic review of qualitative research. *Adolescent Research Review*, *5*(2), 187–211. https://doi.org/10.1007/s40894-019-00118-w

Wilson, O. W. A., Papalia, Z., Duffey, M., & Bopp, M. (2019). Differences in college students' aerobic physical activity and muscle-strengthening activities based on gender, race, and sexual orientation. *Preventive Medicine Reports, 16*, 100984. https://doi.org/10.1016/j.pmedr.2019.100984

World Health Organization [WHO]. (2020). *Youth violence*. World Health Organization. Retrieved February 5, 2023, from https://www.who.int/news-room/fact-sheets/detail/youth-violence

Xu, M., Macrynikola, N., Waseem, M., & Miranda, R. (2020). Racial and ethnic differences in bullying: Review and implications for intervention. *Aggression and Violent Behavior, 50*, 101340. https://doi.org/10.1016/j.avb.2019.101340