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Influence of Cyberbullying on Suicidal Behaviors

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This is to certify that the doctoral study by

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Walden University
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Abstract

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by

David Anthony Dellerman

MS, Walden University, 2010

BA, Columbia College, 2001

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

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Abstract

Secondary data was used to examine the prevalence of suicidal behaviors and the association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors experienced by high school-aged students (Grades 9–12) in the United States using data from the 2017 CDC's Youth Risk Behavior Surveillance System (YRBSS). The YRBSS used in this research was the newest and most comprehensive data. The YRBSS is a national school-based survey, that is used to monitor health-related behaviors including violence, sexual behaviors (heterosexual and SMY students), intentional and unintentional injuries that contribute to suicide behaviors. Results demonstrated the trends of suicidal behaviors over the last 20 years for this population have not decreased. Suicide rates were higher for those students who exhibited an increase in suicidal behaviors. More specifically, there was a disproportionately higher level of suicidal behaviors exhibited by female students. Additionally, this study identified a shrinking difference in suicide rates among males and females. Positive social change implications from this research can provide a framework that informs public health workers, teachers, parents, and students about the prevalence of suicidal behaviors and the association of victimization. An association was identified between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and SMY and suicidal behaviors, it also provides a basis for primary prevention measures for future research to reduce those behaviors associated with victimization and suicidal behaviors. Cyberbullying is a nontraditional form of victimization requiring newer antibullying strategies.

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Chapter 1: Foundation of the Study and Literature Review

Introduction

The United States suicide rate for high school-aged students has reached its highest levels in over 20 years (Niederkrotenthaler et al., 2019). For decades the rate of suicide for youth has fluctuated up and down; however, over the last 20 years the rate of suicide has increased overall for youth (CDC, 2017). The CDC report was especially alarming when considering the rate of suicides for high school-aged students increased from 6.7 per 100,000 in 2007 to 8.7 per 100,000 in 2014 and jumped to 11.8 per 100,000 in 2017. Because there is no single cause for suicide, I looked at multiple risk factors affecting this population. Suicidal behaviors increase when mental and/or physical stressors for the high school-aged students begin to exceed their coping capabilities, which leads to a sense of hopelessness. Conditions like depression, anxiety, and victimization, especially when unaddressed, increase risk for suicide (American Foundation for Suicide Prevention [AFSP], 2019).

The CDC reported that victimization is associated with suicidal behaviors and that the YRBSS contained questions designed to identify the associations and frequency of bullying behaviors, and specific questions regarding cyberbullying (the use of technology to perpetrate aggression) and victimization. I found that more than 20% of youth reported being bullied on school property and 16% reported being cyberbullied through chat rooms, e-mail, instant messaging, texting, and/or website (CDC, 2017). Youth victimized by cyberbullying through the use of social media platforms are at increased risk of suicide, more than students victimized by traditional forms of bullying (Hinduja &

Patchin, 2010). Researchers continue to try to identify associations between increasing rates of school aged suicide and social media platforms. Multiple social media platform studies have been conducted. I focused on identifying an association of quantity of time spent on social media platforms and other research focused on identifying an association of quality of time spent on social media platforms and how positive and negative feedback effected their mental health, and other research focused on those people who have physical social interactions versus losing face-to-face interaction time (Zagorski, 2017).

In this study, I used the newest and most comprehensive YRBSS data set that was generalizable to the entire U.S. school-aged population. Many other studies in which researchers used the YRBSS were older and did not focus on the association of cyberbullying and suicidal behaviors. Those researchers focused on the association of cyberbullying and youth suicide used more narrowly focused data sets collected within specific states. Because the YRBSS is conducted every 2 years, the question of cyberbullying has only been asked four times starting in 2011, limiting the scope of research available for an entire U.S. school-aged population. The information regarding cyberbullying was relatively new for YRBSS. There were very few studies regarding the association of cyberbullying through social media platforms leading to suicidal behaviors (Tokunaga, 2010). There were studies that showed an association between traditional school bullying and suicidal behaviors among high school-aged students. Research on cyberbullying and depression/mental health issues has produced mixed findings (Tokunaga, 2010). My intent was to clarify the association of cyberbullying and suicidal

behaviors using this nation-wide data set. The information from this research adds to the larger body of research to decrease the disparities in findings regarding cyberbullying suicidal behaviors, and increase awareness for public health leaders and the wide spread prevalence of victimization through social media.

Cyberbullying has evolved over the last 4 years (2014–2018). In the early advent of the internet (1990s), teens were limited in their ability to access internet by geographical areas, availability of a home computers, availability of social media platforms, and other factors such as socioeconomics, race, and income. In the last decade, and more notably the last 4 years, access and availability have improved due to increased, affordable internet access and smartphones. Ownership of smartphones, for example, is now nearly universal across all socioeconomics, genders, ethnicities, and races, rising from 45% in 2004, to 73% in 2014, and 95% in 2018 (Pew Research Center, 2018). Additionally, teens are spending more time on the internet: Nearly double from 24% in 2014 to 45% in 2018. This makes victimization more readily available and easier to accomplish from any location.

Victimization of students by students is not new, bullying is not new; what is new is the use of cyberbullying, which has quickly evolved over the last 4 years, and the unknown challenges that accompany this new manner of victimization. Current studies have not concluded why it occurs; how to educate students, parents, and teachers; or how to prevent or minimize its short and long-term impacts. In this study, I focused on understanding the influence that cyberbullying has on suicidal behaviors of this vulnerable population, high school aged young adults in Grades 9–12. Knowledge gained

from this study could be used by public health leaders to develop preventative measures to mitigate suicidal behaviors by victimization through cyberbullying.

Some of the differences in traditional bullying and cyberbullying is that traditional bullying is mostly premeditated while cyberbullying is usually impulsive; traditional bullying is more predictable (planned) while cyberbullying has no geographical limitations, it can happen anywhere, at any time, and be anonymous (Dehue et al., 2012). Pew Research Center reports, overall, 60% of kids report being cyberbullied. Cyberbullying takes place using one of several social media platforms such as Instagram (42% of the time), Facebook (37% of the time), and Snapchat (31% of the time; Broadband Search, 2019). These differences mean that the students is vulnerable to relentless harassment and attacks throughout the day making it harder to combat, and this kind of harassment increases the level of embarrassment for the victim (Hines, 2011). To better protect the mental and physical well-being of high school-aged students, it is important for policy-makers at local, state, and federal levels to develop a new effective primary suicide program. Educating the community about the effects of cyberbullying and suicidal behaviors is important step toward developing prevention programs tailored towards individuals, families, and society.

Problem Statement

A key risk factor for adolescent suicidal behavior is cyberbullying. Despite all the research, over the last decade, the number of suicidal behaviors continue to increase among youth ages 10–24 in the United States (CDC, 2018). The leading causes of deaths are accidents/unintentional injuries (39.6 % of all deaths), and suicide is the second

leading cause of deaths (17.4% of all deaths) (CDC, 2016). This public health issue is of concern because more high school-aged students have died from suicide than AIDS, congenital disabilities, cancer, influenza, heart disease, lung disease, phenomena, and strokes all combined (American Society for the Positive Care of Children [SPCC], 2016). The U.S. Surgeon General recognizes this issue as a priority every year and puts emphasis on identifying and preventing teen suicide through awareness, education, and public health programs targeting risk factors (U.S. Surgeon General, 2012). The key to lowering suicidal behaviors among high school-aged students is to understand better the contributing risk factors associated with suicidal behaviors.

Purpose of the Study

The purpose of this quantitative study was to better understand the influence that cyberbullying has on suicidal behaviors of high school-aged students (Grades 9–12) in the United States by identifying key risk factors contributing to victimization and suicidal behaviors. The social-ecological prevention model (SESPM) is a structured multilevel perspective that public health leaders and stakeholders can use to develop preventative strategies and recommendations for future research. While school bullying has been shown to be associated with suicidal behaviors there has not been a study using nationally representative samples (Messias et al., 2011) while simultaneously using the newest data available for school-aged students. The purpose of this research was to inform public health leaders using the most recent and largest national surveillance data on high school-aged students health behaviors related to cyberbullying and suicidal behaviors for both heterosexual and SMY using the 2017 YRBSS. In the literature review, I summarize

previously established associations between suicidal behaviors (dependent variable) and cyberbullying (independent variable). I further describe research on the association between suicidal behaviors and cyberbullying.

Research Question and Hypotheses

Research Question (RQ): Is there an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health?

Null Hypothesis (H_0): There is not an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health.

Alternative Hypothesis (H_a): There is an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health.

Theoretical Foundation for the Study

Social-Ecological Suicide Prevention Model

The inspiration to use the SESPM in this study came from the social-ecological model and Emile Durkheim's theory of suicide. I used the social-ecological model to create a multi-level perspective understanding of high school-aged students and identify preventative measures. I used Emile Durkheim's theory of suicide to create an

understanding of suicide from the societal integration/norm perspective rather an individual mental health issue under traditional psychology. The SESPM is a structured multilevel perspective that public health leaders use to tailor preventative measures to this specific school-aged population in order to overcome current disparities in research regarding cyberbullying and risk factors for suicidal behaviors. This model can be used by stakeholders to broaden their understanding of how cyberbullying effects suicidal behaviors in order to provide improved recommendations for suicide intervention programs. Cramer & Kapusta (2017) stated that the SESPM could be used to guide research, identify suicidal risk behaviors, victimization, and protective factors for this vulnerable population as done in this research. Chu et al. (2015) explained the suicidal rates experienced by this population and the use of traditional suicide intervention programs, which lack individual and multilevel theoretical development, was the driving force behind this new theoretical foundation for this study.

Durkheim's Theory of Suicide

Rather than study suicide through the lenses of psychology, I studied suicide through the lense of sociology. Emile Durkheim, a pioneer in methodological study of social fact studied suicide through sociological methods and the links between societal structure and suicidal behaviors. In 1897, Emile Durkheim wrote the book, *Le Suicide: Étude de Sociologie*, an influential book that highlighted his theory of suicide using data he collected from his research. Durkheim looked beyond the studies of psychological phenomena and individual phenomena related to suicide and wanted to better understand the aspects of group behavior in relation to suicide. Emile Durkheim's theory of suicide

states that suicide is caused by external forces outside that of the individual, and rather than being an individual act caused by the individual's psychological state, it is due to social disorganization or lack of social solidarity and social integration (Durkheim, 1897/1951).

The Social-Ecological Model

The social-ecological model (SEM) is a broad and comprehensive public health approach that supports the integration Durkheim's societal approach to suicide, risk factors of violence, social/economic norms, and beliefs that create the conditions for victimization and suicidal behaviors. I used the SEM in order to better understand the risk and protective factors in a complex interplay across multiple domains of influence based upon biological, psychological, cultural and gender perceptions. Additionally, I used the dynamic interfaces that link risk factors with other risk factors across the societal, community, relationship, and individual levels to help promote the understanding of cyberbullying on suicidal behaviors. The information from this research could be used to influence new and comprehensive prevention programs designed to reduce the long-standing suicide rates for high school-aged students. The SEM is used to create a theory-based public health view of multilevel competencies that include a clear organized approach to systematic reviews and hierarchical approaches to the quantitative information in this research (Cramer & Kapusta, 2017).

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Nature of the Study

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In this study, I used a case-control approach using the 2017 YRBSS dataset to examine the association between suicidal behaviors and cyberbullying. I compared high

school-aged students who had suicidal behaviors to those high school-aged students who have not had suicidal behaviors. The survey questions and responses that I used in this research included but were not limited to suicidal ideations, suicide plans, suicide attempts, and being cyberbullied. I derived the information in this study from the self-reported responses of heterosexual and SMY students (independent variables) to examine the association between cyberbullying (independent variable) and suicidal behaviors (dependent variables), while controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health (control variables).

The 2017 YRBSS is a cross-sectional, quantitative, secondary dataset that is a nationally representative sample of adolescents in the United States. I was able to increase generalizability in my observational study using this dataset. Qualitative or mixed method research designs were not appropriate using this secondary dataset. The 2017 YRBSS was the most current dataset that included all the required information that was of interest to me. My goal for this study was to raise awareness, lower suicidal behaviors, and to consider cyberbullying prevention strategies nationally if the findings were supported by the 2017 YRBSS data.

Literature Search Strategy

I conducted a systematic review of the English-language literature in order to identify relevant objectives to this study. I limited the literature search to the last 5 years from 2014–2019; however, the literature itself provided information and research from earlier years. The literature included information from the following databases: CINAHL, EBSCO, Google Scholar, JSTOR, and PubMed. These databases yielded information

from multiple disciplines, including epidemiology, psychology, pediatrics, and behavioral health. I used the following search terms: *adolescents, high school, sexual behavior, bullying, cyberbullying, suicidal behaviors, suicidal ideations, and suicidal attempts.* Using advanced and more specific database queries yielded the following associations: sexual behavior and cyberbullying, sexual behavior and suicidal behaviors, sexual behavior and suicidal attempts, high school-aged students and cyberbullying, high school-aged students and sexual behavior, sexual behavior and high school-aged students, cyberbullying and sexual behavior and suicidal behaviors, cyberbullying and sexual behavior and suicidal attempts, cyberbullying and sexual behavior and suicidal attempts. I conducted additional literature searches manually by using peer-reviewed articles and using advanced features of databases that automatically send suggested literature related to previous searched articles.

After identifying all the research articles, I separated the articles into folders using predetermined categories. The predetermined categories were cyberbullying, suicidal behaviors, sexual behavior, cyberbullying and categories behaviors, sexual violence cyberbullying and suicidal behaviors. Before going into the folders, I identified the articles as high school-aged students (Grades 9–12). By identifying the articles by age category, I minimized the need to later filter the information for appropriateness. I used the categorization of folders for easier organization and subsequent searches for writing the literature review. I summarized the findings of each category and the methodologies used in the articles by other researchers. I used the summarized information to develop the methodology in this research.

Literature Review Related to Key Variables and Concepts

Bauman et al. (2013) and Cohen-Almagor, R. (2018) identified antibullying programs are effective at reducing suicidal behaviors and that there is a need for preventive anticyberbullying programs to reduce suicidal behaviors. There is a difference (emotionally and behaviorally) in the way youth experience bullying vs. cyberbullying and there is a need for analysis from longitudinal studies to better understand this difference. Suicide rates dropped the decade before social media; however, after the introduction of social media, suicide rates increased (Luxton, 2012).

Hatzenbuehler et al. (2014) explained that there is a correlation between suicidal behaviors and SMY. The study showed how schools at the local city and state level that put protective measures in place for SMY may reduce suicidal behaviors. The researchers did not identify if national SMY prevention programs would reduce suicidal behaviors in the United States.

Hinduja, S., and Patchin, J. W. (2010) and Kuehn et al. (2018) and Nikalaou, D. (2017) indicated that several research articles had linked suicidal behaviors with school victimization. Additionally, I identified that there is a gap in literature on understanding how cyberbullying leads to suicidal behaviors for youth.

Stonard et al. (2014) identified a gap in the literature in how students who have experienced sexual violence and the psychological and emotional impacts of cyberbullying and how that relates to suicidal behavior. The purpose of this research was to explain the relationships between suicidal behaviors, and sexual violence, suicidal

behaviors, and cyberbullying, but stated that there is not a clear understanding between sexual violence, cyberbullying, and suicidal behaviors.

Vagi et al. (2015) used a 2013 national survey to identify a relationship in self-reported sexual violence and suicidal behaviors in males and females. I did not look at the self-reported sexual violence of SMY and suicide rates.

Young et al. (2017) explained that there is lack of research articles informing on cyberbullying and suicide prevention programs and the link between them. The researchers explained that there are not yet enough studies that would better inform public health leaders to make necessary social changes.

Significance, Summary, and Conclusion

Suicide rates for high school-aged students (15–19 years) continually increased over the last decade (2005–2015) for both males and females (CDC, 2017a). Male suicide rates rose 31% from 10.8 to 14.2 suicide deaths per 100,000 and female suicide rates more than doubled from 2.4 to 5.1 suicide deaths per 100,000; this is the highest rate recorded for females since 1975 (CDC, 2017a). This quantitative study will inform public health leaders on the association found between cyberbullying by high school-aged students (Grades 9–12), both heterosexual and SMY, and suicidal behaviors. This information may be used to inform suicide prevention programs and reduce suicide rates by identifying key risk factors contributing to suicidal behaviors in high school-aged students across the nation. In this study, I used the YRBSS (2017) data set that included complex factors such as bullying by cyber measures, an issue that is relatively new in research studies, as well as health-related behaviors of heterosexual and SMY high

school-aged students. By understanding the relationship between complex social-behavioral risk factors, public health leaders can focus their efforts for high school-aged students. Suicide rates of high school-aged students have not decreased over the last decade, suggesting that previous studies have not identified contributing risk factors. This study's findings could be used by future public health leaders and suicide programs to target appropriate at-risk populations and the contributing factors affecting them.

Knowledge from this study could be used to inform healthcare providers and policy makers to develop and implement new suicidal strategies specifically regarding cyberbullying for high school-aged students. Public health leaders can use the SESPM strategy to inform mechanisms of change at the individual, local community, state, and federal levels to develop a program in which stakeholders at all levels provide primary and secondary cyberbullying guidelines tailored for each school.

Chapter 2: Research Design and Data Collection

Introduction

The purpose of this study was to gain a better understanding of the influence that cyberbullying has on suicidal behaviors among high school-aged students (Grades 9–12) in the United States. There were similar studies that look at suicidal behaviors and cyberbullying regarding college-age students, and there was an older study that looked at a smaller data set regarding cyberbullying and suicide among youth; however, I found no information using a more extensive national secondary database using current data on high school-aged students experiencing cyberbullying, suicidal behavior and SMY. By conducting this study, I filled this the gap using a multi-level social-ecological model as a theoretical framework to understand better how cyberbullying experienced by this population is a risk factor of suicidal behavior. By better understanding how these variables are associated public health leaders and school officials can better identify and prevent those at risk of suicidal behavior and increase awareness and education to stop the violence between the victim and the perpetrator before it begins.

I downloaded the current 2017 YRBSS dataset as a SPSS syntax file and imported using the Statistical Package for the Social Sciences (SPSS) software. The analytical process uses a 95% confidence interval (CI), a p-value of < 0.05 to indicate statistical significance and an odds ratio of < 1.0 (Student's t test for continuous variables and Pearson's Chi-Square for categorical variables) to show a reduction in event rate. Logistical regression was used to examine the influence of cyberbullying on suicidal behavior. In this study, I examined the association of cyberbullying and suicide

behaviors. This required the use of a multiple logistical regression analysis to examine the association of two independent variables on the dependent variable.

I assessed the strength of cyberbullying on suicidal behaviors using multinomial regression, additionally all of the variables are nominal. I used chi-square analysis to identify if there was an association of cyberbullying, suicide behaviors, and covariates. Descriptive statistics was conducted for cyberbullying, suicidal behaviors, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health.

Research Design and Rationale

I addressed the association between cyberbullying and suicidal behaviors of high school-aged students using a case-control approach from secondary data found from 2017 YRBSS that was cross-sectional and nationally representative. I used a multi-level social-ecological model as a theoretical framework to fill gaps in understanding the associations between at risk-populations and risk factors that contribute to suicidal behaviors among high school students. There is currently a lack of nationally representative data that has been analyzed using newer and more comprehensive data, generalizable to the entire U.S. school-aged population.

Creswell (2012) recommended using a quantitative method to identify the research problem using trends as established from the population responses and identifying how the tendencies vary among that population. I used quantitative research to define relationships between variables particularly large population such as the YRBSS data set used in this research paper. The information contained in this study can

help researchers better identify relationships between suicidal behaviors, cyberbullying and the risk of suicidal behaviors by using a quantitative research design.

Methodology

The YRBSS used a three-stage, cluster-sample method to collect data from nearly four million high school-aged students (Grades 9–12) every 2 years. The YRBSS has collected data since 1991 and the most recent data collected comes from the 2017 dataset using nearly 2,000 surveys (CDC, 2016). The CDC conducted the 2017 school-based survey YRBSS at four levels (tribal, local, state, and national). The data collected from the YRBSS is used by private, public, and government organizations such as the CDC to monitor high school-aged (physical and mental) health behaviors over time in order to evaluate policies and to produce preventative measures (programs) that achieve desired organizational or government objectives (CDC, 2016). The data includes information on priority health risk behaviors from leading causes of social, physical, mental problems, suicidal behaviors, and death among high school-aged students.

This three-stage, cluster sample design is accurate within ±5% at a 95% confidence level (CDC, 2017). The first defined the primary sampling units (PSU's), then selected the schools, and finally randomized the selection of participating classes. Participating school sizes were considered when PSUs were selected. The PSU was large enough to be selected according to the probability proportional to the student enrollment (school size), and that the PSU was able to be further subdivided in categories.

The first stage of identifying PSUs included a randomized selection of both private and public schools consisting of large-sized counties or smaller adjacent counties

across the United States. Using the Market Data Retrieval (MDR) database, a randomized selection of both private and public schools was then classified into one of two PSU categories (urban or rural). Urban was defined by being geographically located in one of the 54 largest metropolitan statistical areas (MSAs) located within the United States. Rural was simply defined as not being geographically located in one of these 54 largest MSAs. In the second stage schools identified from the PSU were then identified as whole schools (with all Grades 9–12) or fragmented schools (not having all Grades 9–12) which were combined with other fragmented schools to create a whole school. They were also identified as a large school (≥25 students for each grade) or a small school (<25 students for any grade) were small schools' makeup a quarter of the sampling and all schools were sample with probability proportional to school enrollment size. Researcher working for the CDC randomly selected one or two classes in each school in the final stage.

The CDC cleaned and edited 14,956 questionnaires across 144 schools. Of the 14,956 questionnaires that were cleaned and edited only 14,765 were usable because 191 questionnaires failed quality control. The CDC reports that the YRBSS had a national school-level response rate of 75%, a national student-level response rate of 81%, and an overall national response rate of 60% using a sample size of 14,765 students (CDC, 2016). The data was weighted to adjust for non-response and to make the data representative of the students based on students' grade, sex, grade, and ethnicity/race.

Sampling

The CDC adjusted the sampling design for the 2017 YRBSS using information from previous YRBSS designs according to changing demographics of high school-aged

students. The YRBSS sample size calculations were based on the following three assumptions: the design structure was modified from the previous YRBSS, three Secondary Sampling Units (SSU's) which a was a full school (Grades 9–12) containing at least 28 students was selected within each PSU, and finally using at least a 66% overall response rate.

An advantage of using a national survey database is that the sample is large. The sample size was also predetermined for the secondary data of the YRBSS. The YRBSS national sample sizes between states had a range between 1,273 to 51,087 and a median of 2,139 students that were questioned. According to the CDC, state level response rates for the YRBSS questionnaire had a student response rate of 66% to 90%, a school response rates of 68% to 100%, and an overall response rate of 60% to 82% (2017). In order to get the overall response rate, the following equation was used the: (number of participating schools/numbers of eligible sampled schools) x (number of usable questionnaires/numbers of eligible students sampled (CDC, 2017).

To account for the complex sampling design, I used both SAS and SUDAAN software to conduct statistical analyses on weighted responses. Additionally, I used logistic regression analyses to identify if the *p* value was considered statistically significant for all available estimates. Not directly stated in the research analysis was the power; however, I did use a conventional beta (b) of 0.20 to produce an 80% power.

I included data for heterosexual and SMY data. The YRBSS provides a sufficient sample size and a precision level with a confidence of 95% for analyses of health- related behaviors by sexual identity and analyses of health-related behaviors by: sex,

race/ethnicity, grade, sexual identity, and sex of sexual contacts and for interactions sex by race/ethnicity, sex by grade, race/ethnicity by sex, grade by sex, sex by sexual identity, sexual identity by sex, sex by sex of sexual contacts, and sex of sexual contacts by sex (CDC, 2017).

I used G*Power 3.1 Statistical Power Analyses to determine that a minimum total sample size of 30 was required. The input parameters included a large effect size Cohen's $f2$ (0.35), α error probability (0.05), Power: 1- β err prob (0.95), odds ratio (1.0), and number of predictors (2). The available number of sample sizes from the YRBSS well exceeds the minimum sample requirements. The samples sizes vary from state to state however the lowest sample size was 1,273 and the largest was 51,087.

Validity and Reliability

The YRBSS has been conducted for over 2 decades by local, state, and national entities assessing the risk behaviors of students. The CDC has conducted two reliability evaluations on the YRBSS questionnaire, one in 1991 and the other in 1999. More recently the CDC conducted an in-depth, systematic review of the YRBSS and study on validity (CDC, 2016).

The first test of reliability conducted in 1991 used a convenience sample among 1,679 students (Grades 7–12). The researchers compared the two tests that were administered two weeks apart and found no statistical significance between the two tests. Findings indicated that for those students (Grades 8–12) were highly reliable but when viewed for 7th grade it was not as reliable. The second test of reliability conducted in 1999 used a convenience sample among 4,619 students also administered two weeks apart and found

no statistical significance between the tests. It identified 10 questions with low prevalence estimates which were revised for future test.

The CDC reported that a test of validity has not been conducted on the self-reported behaviors of high school-aged students within the YRBSS (2017). In 2003, the CDC reviewed the validity of adolescent self-reporting of behaviors using existing literature and determined that while situational factors can affect the test, they did not threaten the validity of the test.

Ethical Procedure

Data-collection protocols required parental permission before administering the questionnaire in any school. Parental permission consists of active permission (parents send signed permission for the child to participate) and passive permission (parents send signed permission if they do not want their child to participate). Trained data collectors were sent to the participating schools where they recorded information about schools and classrooms and read a standardized script prior to administering the questionnaires to students.

The data collected from the trained collectors was used to weight data and verify sample selections throughout the YRBSS process. The YRBSS procedures were designed to provide anonymity and protect privacy. Students recorded their responses directly in a computer-scannable booklet or computer. Data collectors attempted to spread students out and were encouraged to cover the questionnaire with a piece of paper as they go along. A system of checks and balances for data processing was conducted between technical contractors (who send raw data to the CDC) and the CDC who complete logical

performed by the Survey Data Management to process. Those data files were transferred, logged, and reported using Survey Technical Assistance Website and available for public use.

Significance, Summary, and Conclusion

This chapter contains the research design and methodology for this secondary, cross-sectional database using a quantitative, case-control approach on the association of those cyberbullied and suicidal behaviors. The 2017 YRBSS is a reliable and valid data set that was a nationally representative secondary collection of field-tested questions and answers. The CDC provided the required parental permissions, and maintained confidentiality, and an appropriate level of anonymity for those students in this survey.

The YRBSS questionnaire was established in 1991 and has conducted a survey by the CDC and multiple school-based local, state, federal, and tribal agencies every 2 years. I used the most recent release of the CDC's YRBSS 2017 dataset. The data used for this research is nationally representative of high school-aged students (Grades 9–12). The CDC provides a description of the YRBSS methodology to better improve and revise the questionnaire to adapt to cultural changes over time. As such, I included the data for sexual minority students (lesbian, gay, bisexual students, and students not sure of their sexual identity).

Chapter 3: Results and Findings

Introduction

The purpose of this cross-sectional quantitative study was to better understand the influence that cyberbullying has on suicidal behaviors of high school-aged students (Grades 9–12) in the United States by identifying key risk factors contributing to victimization and suicidal behaviors. I used a case-control method to examine the CDC's secondary cross-sectional data gathered during the 2017 YRBSS national high school survey to analyze these key risk factors. I used the results and findings of the data analyses as well as the quantitative research design and case-control methodology described in Chapter 2 to answer the following research question and tested whether to accept or reject the hypotheses:

Research Question (RQ): Is there an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health?

Null Hypothesis (H_0): There is not an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth (SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health.

Alternative Hypothesis (H_a): There is an association between cyberbullying by high school-aged students (Grades 9–12) both heterosexual and sexual minority youth

(SMY) and suicidal behaviors, after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health.

Accessing the Data Set for Secondary Analysis

I choose the SPSS version 27 software package to analyze this secondary data from the 2017 YRBSS data files, which are accessible on the CDC's website and available for download in an ASCII (.DAT) file format. The CDC provided an additional add-on module required for the SPSS program to convert the ASCII file. I electronically downloaded and saved the ASCII and additional add-on module SPSS (.SPS) text format files in a designated desktop folder for this research. The SPSS syntax reads the ASCII file and creates a formatted SPSS data file that can be analyzed in the SPSS program (CDC, 2018).

The ASCII data file required file location specification changes within the data file itself (recode the file) in order to have SPSS open, identify, and read the data file. Prior to this, SPSS could not read the ASCII data file. I converted the ASCII data file so it could be opened in the SPSS editor and converted from (.DAT) into a useable (.SAV) output file readable in the SPSS program. I was able to import and manage the large YRBSS ASCII and SPSS data files using the SPSS statistical software package. Additionally, I was able to analyze the complex design of the YRBSS, such as the clustering, stratification, unequal selection probabilities, testing of the H_0 and H_a, getting the confidence intervals, and standard errors (CDC, 2018).

Study Results Descriptive Analysis

The 2017 YRBSS dataset was a nationally representative sample of 14,765 high school-aged students in the United States. Census data for 2017 shows that the 14,765 high school-aged students in the 2017 YRBSS dataset represented 15.19 million high school-aged students in the United States (Statista, 2017). I recorded the nationally represented data from SPSS and presented that data. Additionally, I converted the nationally represented data from SPSS back into millions of high school-aged students and presented that data in Tables 9–118 indicated in (parentheses). I used SPSS software to analyze the 14,765 usable questionnaires in the 2017 YRBSS dataset. The response rate reported in the 2017 YRBSS for schools was (75 %) 144 of 192 sampled schools; for students was (81%) 14,956 of 18,324 and 14,765 usable questionnaires; and overall was (60%), where school response rate * student response rate was 75% * 81% (CDC, 2018).

The YRBSS has several questions used for cross-editing in order to identify missing, conflicting, demographic regularities, and logical inconsistency. There were many questions on the survey that allowed for multiple responses and other responses. Additionally, not all data within the ASCII files were given numerical coding. This research identified many of the secondary data questions inputted into the SPSS software and edited criteria to correct nominal and ordinal data. The variable data was then appropriately coded with numbers (i.e., 1 = Female and 2 = Male) to ensure the desired research questions met logical consistency (Greasley, 2008). Chi-Square, descriptive statistics, frequency, crosstabulation, and multiple regression analysis were run for accuracy, standardization, consistency, goodness-of-fit, errors, relationship of variables,

outcomes, and to analyze multiple data points for this research and to support future researchers. The null hypothesis was rejected since the finding indicate that cyberbullying influences suicidal behaviors.

I organized chapter 3 tables and their corresponding analyses into three defining sections (data dictionary, multiple regression analysis, and crosstabulation analysis). crosstabulation analysis provides deeper details of the research variables, analysis, and frequencies. I consolidated seventeen crosstabulation tables into ten refined crosstabulation tables that highlight the independent variable cyberbullying and the dependent variable suicidal behaviors in (Tables 9–13) and the association of cyberbullying on suicidal behaviors in (Tables 14–18).

Data Dictionary

The data dictionary was created concurrently and refined during all phases of this research to capture the attributes, elements, definitions, and metadata. I identified the following YRBSS questions (Q2, Q4, Q5, Q24, Q26, and Q67) to answer the research question. These questions were first defined in the data dictionary and then categorized into the following three focus areas: cyberbullying, suicidal behaviors, and the association of cyberbullying and suicidal behaviors. All the variables in this research are categorical/nominal.

Multiple Regression Analysis

I conducted multiple regression analysis to determine if there is an association between the (independent variable) cyberbullying by high school-aged students (Grades 9–12), both heterosexual and SMY, and the (dependent variable) suicidal behaviors. I

used multiple regression analysis to validate the association between cyberbullying and suicidal behaviors. A risk assessment was run for collinearity between variables to identify an association, and no collinearity was identified. I conducted the analyses using 95% CI, a p-value of < 0.05 and odds ratio of < 1.0 to identify statistical significance, however; analysis during the test yielded CI $= 95\%$, odds ratio $= 4.49$, and p-value $= 0.00$ indicating statistical significance. The findings from Tables 1–8 support a medium positive association between the variable's suicidal behaviors and cyberbullying. It is unlikely that all the coefficients equal zero (no linear relationship between the variables). Additionally, the variables are different between groups, normally distributed, and multicollinearity most likely does not exist between variables.

Tables 1 through 8

In Table 1, symmetric measures, including Phi and Cramer's V $= .257$, indicating a medium association between cyberbullying and suicidal behaviors. A separate Quantile-Quantile (Q-Q) Plot not present in this research supports the Cramer's V $= .257$ and shows a positive association graphical trend; as the values of one variable increase, so does the value of the variable increase.

In Table 2, chi-square tests, including Pearson's Chi-Square Test and Fisher's Exact Test (2-sided) $= .000$, the alpha level was p $=0.05$ and df $= 1.0$; thus, the null hypothesis is rejected. There was sufficient evidence that the observed distribution was not the same as the expected distribution and that a relationship exists between the variables. Chi-Square was sensitive to sample size, and small differences can still appear to be significant. According to SPSS datasets with large sample sizes (greater than 500),

the *p* values were estimated based on the assumption that the data conforms to a

particular distribution and assumes significance (Mehta & Patel, 2013). IBM

recommended a secondary chi-square analysis using Monte Carlo. For this research and

for confidence, I ran a secondary analysis with significance set at .01, and the data

remained statistically significant.

Table 3 risk estimates show the odds ratio of having suicidal behaviors is 4.49

times greater for high school-aged students who were cyberbullied compared to high

school-aged students who were not cyberbullied.

Table 4 model summary shows Sig. F. Change and R Square as graduated

variables added to each new model. As each new predictor was added to the next model,

the Sig. F. Change and R Square were recalculated through models 1–4 footnoted (a. –

d.), and all predictors culminated towards model 5 footnoted (e.). As SPSS added one

new predictor across the five models, Sig F. Change remained at .000, and R Square

remained positively correlated between the variables. Variance for the dependent variable

suicidal behaviors remain high, indicating less error in the model, which would also

support more precise predictions across the independent variables through each of the

graduated models. R Square is the percentage of the variance in suicidal behaviors that

the predictors can explain in each model. The Sig F. Change supports that the regression

model proves a better fit to the data than a model with no independent variable and that

there was a linear relationship. R Square for all predictors taken as a set account for .956

(95.6%) of the variance in suicidal behaviors. This table indicates that model 5 with all

predictors was statistically significant, $F(1,11171) = 36.92$, $p = 000$. T

Table 5 ANOVA results were $F(5, 11170) = 260.81$, p = .000, R2 = .956. The ANOVA p-value of .000 was statistically significant with a p-value $\leq \alpha$. Therefore, the null hypothesis is rejected, the (H_a) is accepted and at least two group means were statistically different from each other. In this table, the large F value indicates the variables used in this research were different from each other when compared to the variations of the individual observations and larger than what would be expected by chance.

In Table 6 coefficients, the coefficients test for collinearity shows a variance inflation factor (VIF) of 1.03 for the independent variable cyberbullied and dependent variable suicidal behaviors and indicates that collinearity may not exists between these two variables. VIF was < 1.04 for all the independent variables in this research, indicating there may not be collinearity between any of the independent variables. VIF > 10 would indicate multicollinearity. However, for this research, the VIF was well below this threshold. The Coefficient Table at alpha =.05 for the predictors yielded the following significance (cyberbullying p= 0.00), (sex p = 0.00, (race p = .997), (Hispanic/Latino p = .145), and (sexual identity p = 0.00).

Table 7 collinearity diagnostics shows that for all the predictors that there was no collinearity with the dependent variable. The Eigen Value for all six predictor dimensions indicates some independent contribution to the data and does not indicate multicollinearity. The condition index with values < 30 does not show strong multicollinearity, and none of the values in this table were above 30. Additionally, no two

variance proportions exceed 0.9 in any of the dimensions, which was a predictor for multicollinearity.

Table 8 residual statistics shows Std. Residual between (-2.545 and 1.811) no outliers and within the normal range between -3 and 3. Cooks Distance within a normal range of < 1, which suggests that there were no large residuals/outliers to influence the accuracy of the regression model. The table supports the regression model was a good fit.

Table 1

Symmetric Measures: Considered Suicide and Cyberbullied, 2017

		Value
Nominal by Nominal	Phi	.257
	Cramer's V	.257
	Contingency Coefficient	.249
N of Valid Cases		14505

Table 2

Chi-Square Tests: Considered Suicide and Cyberbullied, 2017

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	954.787	1	.000		
Continuity Correction	952.870	1	.000		
Likelihood Ratio	793.044	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	954.721	1	.000		
N of Valid Cases	14505				

Table 3

Odds Ratio: Considered Suicide and Cyberbullied, 2017

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Considered suicide (Yes / No)	4.493	4.061	4.971
For cohort cyberbullying = Yes	3.309	3.067	3.570
For cohort cyberbullying = No	.736	.716	.758
N of Valid Cases	14505		

Table 4

Goodness of Fit for Logistic Regression Models1–5

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.971[a]	.943	.943	.445	.000
2	.976[b]	.952	.952	.409	.000
3	.977[c]	.954	.954	.399	.000
4	.978[d]	.956	.955	.393	.000
5	.978[e]	.956	.956	.392	.000

Note. a. Model 1: Cyberbullied*;* b. Model 2: Cyberbullied, Are you Hispanic/Latino*;* c.

Model 3: Cyberbullied, Are you Hispanic/Latino, What is your sex, d. Model 4:

Cyberbullied, Are you Hispanic/Latino, What is your sex, What is your race*;* e. Model 5:

Cyberbullied, Are you Hispanic/Latino, What is your sex, What is your race, Sexual

identity

Table 5

Linear Regression: Considered Suicide and Cyberbullied, 2017

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	169.370	5	33.874	260.805	.000
	Residual	1450.786	11170	.130		
	Total	1620.156	11175			

Table 6

Test for Collinearity: Between All Variables

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.384	.030		45.577	.000		
	Cyberbullying	.241	.010	.225	24.723	.000	.969	1.032
	What is your sex	.055	.007	.072	7.932	.000	.960	1.041
	What is your race	-1.136	.003	.000	-.004	.997	.988	1.012
	Hispanic/Latino	.013	.009	.013	1.458	.145	.996	1.004
	Sexual identity	-.087	.004	-.179	-19.716	.000	.969	1.032

Table 7

Collinearity Diagnostics: Between All Variables

				Variance Proportions					
Model	Dimension	Eigen Value	Condition Index	(Constant)	Cyber bullied	What is Your Sex	What is Your Race	Are you Hispanic/ Latino	Sexual Identity
1	1	5.549	1.000	.00	.00	.00	.00	.00	.01
	2	.254	4.670	.00	.00	.04	.01	.00	.85
	3	.092	7.762	.00	.00	.58	.33	.01	.05
	4	.059	9.712	.01	.12	.28	.50	.13	.03
	5	.036	12.348	.00	.44	.03	.01	.54	.00
	6	.010	23.786	.99	.43	.06	.15	.31	.07

Table 8

Residuals Statistics: Linear Regression Measuring for Variable Outliers

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.35	1.92	1.82	.123	11176
Residual	-.917	.653	.000	.360	11176
Std. Predicted Value	-3.872	.755	.000	1.000	11176
Std. Residual	-2.545	1.811	.000	1.000	11176
Cook's Distance	.000	.002	.000	.000	11176

Crosstabulation Results

Crosstabulation analysis was conducted in Tables 9–18 on the categorical/nominal data to determine if there is an association between the variables in this research. The crosstabulations analysis enhanced understanding of the 14,765 YRBSS questionnaires collected for this research and provided trends, probabilities, relationships, and patterns between each of the variables, not only for this research but also for future research. The following tables provide future researchers, leaders, and key holders the ability to take the nationally representative sample data from SPSS outputs and make decisions, generalizations, and conclusions about how the variables were related. This will allow public health leaders, school administrators, and parents to decide what or if any of the data is significant, what it means to their research, and how to apply that that information to the population in order to tailor preventative measures. Additionally, the crosstabulations analysis includes percent (%) within groups to enable

future researchers the ability to interpret the (%) within data at each variable. As in Table 11, Students by Sex: That Considered Suicide and Students That Cyberbullied Female = 1398 count, however within sex 1398/7464 =18% (within female population only) were cyberbullied, within cyberbullying 1398/2089 = 66.9% (between males and females) were cyberbullied, and total 1398/14479 = 9.7% (females out of total population) that were cyberbullied.

Tables 10 through 14

Tables 10–14 focused on the independent variable cyberbullying, a form of victimization and violence that the CDC identifies as a leading cause of death among high school-aged students. Additionally, tables 10–14 focused on the dependent variable suicidal behaviors, a form of decreased mental health which, according to the CDC, has negative outcomes in the health and development of high school-aged students. These two focus areas include the following four independent variables sex, sexual identity, Hispanic, and race.

Cyberbullying was identified from Q 24 from the 2017 YRBSS, "During the past 12 months, have you ever been cyberbullied". The data revealed that in the last year 14.3% (2.17 million) of high school-aged students were cyberbullied. Of those high school-aged students that were cyberbullied Female = 9.7% (1.47 million), Male 4.8% (0.73 million), Heterosexual = 11.0% (1.67 million), Gay/Lesbian = 0.5% (0.08 million), Bisexual = 2.1% (0.32 million), Not Sure = 0.9% (0.01 million), Hispanic = 3.2% (0.49 million), American Indian or Alaska Native = 0.5% (0.08 million), Asian = 0.6% (0.09 million), Black or African American = 2.3% (0.35 million), Native Hawaiian or Other

Pacific Islander = 0.3% (0.05 million), White = 10.0% (1.52 million), and Other = 1.3%

(0.20 million).

Suicidal behaviors were identified from Q 26 from the 2017 YRBSS, "During the

past 12 months did you ever seriously consider attempting suicide". The data revealed

that in in 2017 year 17.4% (2.64 million) of high school-aged students had suicidal

behaviors. Of those high school-aged students that suicidal behaviors Female = 11.7%

(1.78 million), Male 5.9% (0.90 million), Heterosexual = 11.7% (1.78 million),

Gay/Lesbian = 1.0% (0.15 million), Bisexual = 3.8% (0.58 million), Not Sure = 1.4%

(0.21 million), Hispanic = 4.3% (0.65 million), American Indian or Alaska Native = 0.7%

(0.11 million), Asian = 1.0% (0.15 million), Black or African American = 3.7% (0.56

million), Native Hawaiian or Other Pacific Islander = 0.4% (0.06 million), White =

10.4% (1.58 million), and Other = 1.9% (0.29 million).

Table 9

Demographics: Students That Considered Suicide and Students That Were Cyberbullied

		Considered Suicide %	Cyberbullying %
Valid	Yes	14.3	17.4
	No	84.5	81.2
	Total	98.8	98.6
	Missing	1.2	1.4
Total		100.0	100.0

Table 10

By Sex: Students That Considered Suicide and Students That Were Cyberbullied

			Considered Suicide	Cyber bullied
What is your sex	Female	Count	1684	1398
		% What is your sex	22.6%	18.7%
		% Considered suicide	66.5%	66.9%
		% of Total	11.7%	9.7%
	Male	Count	848	691
		% What is your sex	12.1%	9.9%
		% Considered suicide	33.5%	33.1%
		% of Total	5.9%	4.8%
Total		Count	2532	2089
		% What is your sex	17.5%	14.4%
		% Considered suicide	100.0%	100.0%
		% of Total	17.5%	14.4%

Table 11

By Sexual Identity: Students That Considered Suicide and Students That Were

Cyberbullied

			Considered Suicide	Cyber Bullied
Sexual identity	Heterosexual (straight)	Count	1623	1529
		% Sexual identity	13.7%	12.8%
		% Considered suicide	65.4%	75.6%
		% of Total	11.7%	11.0%
	Gay or lesbian	Count	142	69
		% Sexual identity	40.9%	20.1%
		% Considered suicide	5.7%	3.4%
		% of Total	1.0%	0.5%
	Bisexual	Count	527	299
		% Sexual identity	47.2%	26.7%
		% Considered suicide	21.3%	14.8%
		% of Total	3.8%	2.1%
	Not sure	Count	188	125
		% Sexual identity	32.0%	21.1%
		% Considered suicide	7.6%	6.2%
		% of Total	1.4%	0.9%
Total		Count	2467	2022
		% Sexual identity	17.8%	14.5%
		% Considered suicide	100.0%	100.0%
		% of Total	17.8%	14.5%

Table 12

By Hispanic/Latino: Students That Considered Suicide and Students That Were Cyberbullied

			Considered Suicide	Cyber Bullied
Are you Hispanic/Latino	Yes	Count	621	461
		% Are you Hispanic/Latino	17.3%	12.8%
		% Considered suicide	24.7%	22.2%
		% of Total	4.3%	3.2%
	No	Count	1894	1616
		% Are you Hispanic/Latino	17.7%	15.0%
		% Considered suicide	75.3%	77.8%
		% of Total	13.2%	11.3%
Total		Count	2507	2077
		% Are you Hispanic/Latino	17.6%	14.5%
		% Considered suicide	100.0%	100.0%
		% of Total	17.6%	14.5%

Table 13

By Race: Students That Considered Suicide and Students That Were Cyberbullied

			Considered Suicide	Cyber Bullied
What is your race	American Indian or Alaska Native	Count	84	64
		% What is your race	18.6%	14.2%
		% Considered suicide	3.6%	3.3%
		% of Total	0.7%	0.5%
	Asian	Count	130	82
		% What is your race	18.2%	11.5%
		% Considered suicide	5.6%	4.2%
		% of Total	1.0%	0.6%
	Black or African American	Count	472	292
		% What is your race	15.8%	9.8%
		% Considered suicide	20.4%	15.0%
		% of Total	3.7%	2.3%
	Native Hawaiian or Other Pacific Islander	Count	55	45
		% What is your race	19.0%	15.4%
		% Considered suicide	2.4%	2.3%
		% of Total	0.4%	0.3%
	White	Count	1334	1289
		% What is your race	17.9%	17.3%
		% Considered suicide	57.6%	66.3%
		% of Total	10.4%	10.0%
	Other	Count	241	172
		% What is your race	24.7%	17.5%
		% Considered suicide	10.4%	8.8%
		% of Total	1.9%	1.3%
Total		Count	2303	1944
		% What is your race	18.0%	15.1%
		% Considered suicide	100.0%	100.0%
		% of Total	18.0%	15.1%

Tables 14 through 18

Tables 14–18 focused on the variables cyberbullying and suicidal behaviors. These two variables were previously assessed in tables 2–9 for an association, the strength of association, and whether to accept or reject the null hypothesis. These focus areas include the following four independent variables sex, sexual identity, Hispanic, and race. The following crosstabulation tables further report on the correlational changes between the variables and expound on the patterns, trends, and probabilities within the SPSS data output beyond that of the regression analysis alone.

The association between cyberbullying and suicidal behaviors was identified from Q 24 and Q 26 from the 2017 YRBSS. The 2017 YRBSS did not provide any associated information between these two variables. As previously indicated, there was a gap in the main body of literature research available for the association of cyberbullying and suicidal behaviors.

However, Table 14 in this research shows that 6.0% (0.91 million) of high school-aged students that were cyberbullied also considered suicide, and 8.6% (1.31 million) of those students who were cyberbullied did not consider suicide.

The data for those high school-aged students who had suicidal behaviors and were cyberbullied was Female = 11.7% (1.78 million), Male 5.8% (0.89 million), Heterosexual = 11.7% (1.78 million), Gay/Lesbian = 1.0% (0.15 million), Bisexual = 3.8% (0.58 million), Not Sure = 1.4% (0.21 million), Hispanic = 4.3% (0.65 million), American Indian or Alaska Native = 0.7% (0.11 million), Asian = 1.0% (0.15 million), Black or

African American = 3.6% (0.55 million), Native Hawaiian or Other Pacific Islander = 0.4% (0.06 million), White = 10.4% (1.58 million), and Other = 1.9% (0.29 million).

Table 14

Demographics: Students That Considered Suicide and Were Also Cyberbullied

			Considered Suicide		
			Yes	No	Total
Cyberbullying	Yes	Count	866	1224	2090
		% Cyberbullying	41.4%	58.6%	100.0%
		% Considered suicide	33.9%	10.2%	14.4%
		% of Total	6.0%	8.4%	14.4%
	No	Count	1689	10726	12415
		% Cyberbullying	13.6%	86.4%	100.0%
		% Considered suicide	66.1%	89.8%	85.6%
		% of Total	11.6%	73.9%	85.6%
Total		Count	2555	11950	14505
		% Cyberbullying	17.6%	82.4%	100.0%
		% Considered suicide	100.0%	100.0%	100.0%
		% of Total	17.6%	82.4%	100.0%

Table 15

By Sex: Students That Considered Suicide and Were Also Cyberbullied

			Considered Suicide		
			Yes	No	Total
What is your sex	Female	Count	1679	5742	7421
		% What is your sex	22.6%	77.4%	100.0%
		% Considered suicide	66.7%	48.4%	51.6%
		% of Total	11.7%	39.9%	51.6%
	Male	Count	840	6133	6973
		% What is your sex	12.0%	88.0%	100.0%
		% Considered suicide	33.3%	51.6%	48.4%
		% of Total	5.8%	42.6%	48.4%
Total		Count	840	11875	14394
		% What is your sex	12.0%	82.5%	100.0%
		% Considered suicide	33.3%	100.0%	100.0%
		% of Total	5.8%	82.5%	100.0%

Table 16

By Sexual Identity: Students That Considered Suicide and Were Also Cyberbullied

			Considered Suicide		
			Yes	No	Total
Sexual identity	Heterosexual (straight)	Count	1619	10232	11851
		% Sexual identity	13.7%	86.3%	100.0%
		% Considered suicide	65.6%	89.6%	85.3%
		% of Total	11.7%	73.7%	85.3%
	Gay or lesbian	Count	137	201	338
		% Sexual identity	40.5%	59.5%	100.0%
		% Considered suicide	5.6%	1.8%	2.4%
		% of Total	1.0%	1.4%	2.4%
	Bisexual	Count	523	587	1110
		% Sexual identity	47.1%	52.9%	100.0%
		% Considered suicide	21.2%	5.1%	8.0%
		% of Total	3.8%	4.2%	8.0%
	Not sure	Count	188	399	587
		% Sexual identity	32.0%	68.0%	100.0%
		% Considered suicide	7.6%	3.5%	4.2%
		% of Total	1.4%	2.9%	4.2%
Total		Count	2467	11419	13886
		% Sexual identity	17.8%	82.2%	100.0%
		% Considered suicide	100.0%	100.0%	100.0%
		% of Total	17.8%	82.2%	100.0%

Table 17

By Hispanic/Latino: Students That Considered Suicide and Were Also Cyberbullied

			Considered Suicide		
			Yes	No	Total
Are you Hispanic/Latino	Yes	Count	617	2973	3590
		% Are you Hispanic/Latino	17.2%	82.8%	100.0%
		% Considered suicide	24.6%	25.3%	25.1%
		% of Total	4.3%	20.8%	25.1%
	No	Count	1890	8800	10690
		% Are you Hispanic/Latino	17.7%	82.3%	100.0%
		% Considered suicide	75.4%	74.7%	74.9%
		% of Total	13.2%	61.6%	74.9%
Total		Count	2507	11773	14280
		% Are you Hispanic/Latino	17.6%	82.4%	100.0%
		% Considered suicide	100.0%	100.0%	100.0%
		% of Total	17.6%	82.4%	100.0%

Table 18

By Race: Students That Considered Suicide and Were Also Cyberbullied

| | | | Considered Suicide | | |
			Yes	No	Total
What is your race	American Indian or Alaska Native	Count	84	365	449
		% What is your race	18.7%	81.3%	100.0%
		% Considered suicide	3.6%	3.5%	3.5%
		% of Total	0.7%	2.8%	3.5%
	Asian	Count	128	579	707
		% What is your race	18.1%	81.9%	100.0%
		% Considered suicide	5.6%	5.5%	5.5%
		% of Total	1.0%	4.5%	5.5%
	Black or African American	Count	466	2508	2974
		% What is your race	15.7%	84.3%	100.0%
		% Considered suicide	20.2%	23.8%	23.2%
		% of Total	3.6%	19.6%	23.2%
	Native Hawaiian or Other Pacific Islander	Count	53	235	288
		% What is your race	18.4%	81.6%	100.0%
		% Considered suicide	2.3%	2.2%	2.2%
		% of Total	0.4%	1.8%	2.2%
	White	Count	1332	6094	7426
		% What is your race	17.9%	82.1%	100.0%
		% Considered suicide	57.8%	57.9%	57.9%
		% of Total	10.4%	47.5%	57.9%
	Other	Count	240	735	975

	% What is your race	24.6%	75.4%	100.0% *(Table continues)*
	% Considered suicide	10.4%	7.0%	7.6%
	% of Total	1.9%	5.7%	7.6%
Total	Count	2303	10516	12819
	% What is your race	18.0%	82.0%	100.0%
	% Considered suicide	100.0%	100.0%	100.0%
	% of Total	18.0%	82.0%	100.0%

Summary

The 2017 YRBSS secondary data was used in this quantitative study to examine the association between cyberbullying by high school-aged students (Grades 9–12), both heterosexual and SMY, and suicidal behaviors after controlling for age, race/ethnicity, sex, high-risk substance use, sexual behavior, and mental health. SPSS Statistics software was used to identify a correlational relationship between the dependent variable suicidal behaviors and the independent variable cyberbullying. The dependent variable suicidal behaviors was represented by Q 26 from the 2017 YRBSS, "During the past 12 months did you ever seriously consider attempting suicide". The independent variable cyberbullying was represented by Q 24 from the 2017 YRBSS, "During the past 12 months, have you ever been cyberbullied".

Multiple Logistic Regression Summary

Multiple logistic regression analysis was used to carry out the correlational research between variables. Key findings for this research are as follows. Symmetric

measures analyses (Q-Q) Plot, Phi, and Cramer's V = .257 indicate a positive medium association between variables. Pearson's Chi-Square Test = .000, the alpha level was p =0.05 and df = 1.0; thus, I concluded a relationship does exist between the variables. Significance for chi-square was expected as an artifact of SPSS and calculating large sample sizes. Chi-Square was sensitive to sample size, and small differences show significance. The odds ratio indicates suicidal behaviors were 4.49 times greater for those cyberbullied compared to those not cyberbullied. Sig. F. remained at .000 for all five models and supports that a linear regression model was a good fit. R Square for all predictors in model 5 =. 95.6% of the variance in suicidal behavior. The predictors in model 5 were statistically significant, $F(1,11171) = 36.92$, $p = 000$. ANOVA is $F(5, 11170) = 260.81$, $p = .000$, $R2 = .956$. The (HA) was accepted; at least two group means were statistically different from each other. F values indicate that the variables were different from each other and larger than expected by chance. A variance inflation factor (VIF) of < 1.04 suggests that collinearity may not exists between the variables. Std. Residual was between (-2.545 and 1.811) with no large residuals/outliers to influence the accuracy of the regression model, which all supports the regression model was a good fit.

Crosstabulation Summary

Crosstabulation analysis was used to examine the relationship between the variables. The data revealed that in the last year, 14.3% (2.17 million) of high school-aged students were cyberbullied, 17.4% (2.64 million) had suicidal behaviors, and 6.0% (0.91 million) of those that were cyberbullied also considered suicide.

The analyses conducted for this research indicate that the prevalence of cyberbullied was twice as much for females as males, twice as much for bisexuals compared to those who identify as heterosexual, and was highest among others for the category race/ethnicity.

The analyses conducted for this research indicate the prevalence of suicidal behaviors were twice as much for females as males, nearly three times as much for gay/lesbian, bisexual than for heterosexual, and the prevalence of other being suicidal behaviors was highest among other for the category race/ethnicity.

The analyses conducted for this research indicate the prevalence of those who had suicidal behaviors and were cyberbullied was twice as much for females than males, nearly three times as much for gay/lesbian, bisexual, and not sure as compared to those who identify as being heterosexual and was highest among other for the category race/ethnicity.

Chapter 4: Implications for Social Change

Introduction

The purpose of this quantitative study was to better understand the influence that cyberbullying has on suicidal behaviors of high school-aged students (Grades 9–12) in the United States by identifying key risk factors contributing to victimization and suicidal behaviors. This research was part of that exploration into the human domain with the goal of improving the overall health outcomes for high school-aged students. The CDC reports that more people were hospitalized with suicidal behaviors than actual suicide injures (Stone et al., 2017). Suicidal behaviors within a developing teenager are part of a complex socio-ecological environment and I did not attempt to review all risk factors and inequalities that occur between/within groups. I explored a limited number of key risk factors and variables contributing to victimization and suicidal behaviors that occur within the spectrum of high school-aged students. I used the SESPM, a social-ecological model in conjunction with Emile Durkheim's theory of suicide, to guide my research through a multi-level perspective lens and provide accurate and responsible data for future research. It is essential for policymakers at local, state, and federal levels to develop a new effective primary suicide program to better protect this vulnerable population's mental and physical well-being.

Multiple cross-sectional studies that reviewed cyberbullying and depression have identified that there is more of an increase in both short and long-term depressive and low self-esteem effects with cyberbullying compared to traditional bullying; however, some studies refute these findings (Menesini et al., 2012). A lack of coherent agreement in the

literature has not been fruitful in providing a lot of evidence to support this research one way or another. Olweus and Limber (2018) explained that while there is an interesting point regarding the lack of agreeance between the two variables cyberbullying and suicidal behaviors that they are not a distinct phenomenon. Instead that these two variables are part of a complicated area of interest. It is with great humility that I add my research findings to the literature.

Interpretation of the Findings

I did not intend for this research to interpret causality but rather identify associations that exist between variables using a series of testing. I used chi-square, descriptive statistics, frequency, crosstabulation, and multiple regression analysis to check for accuracy, standardization, consistency, goodness-of-fit, errors, relationship of variables, outcomes, and to analyze multiple data points for this research and to support future research.

I identified an association between the dependent variable's suicidal behaviors and the independent variable cyberbullying. I expected the influence of cyberbullying on suicidal behaviors to have a larger association at the initial onset of this research; however, the data did reveal a moderate positive association using symmetric measures. The goodness of fit test determined that the model was a good fit in that the observed sample corresponded with the expected probability distribution. All five models were statistically significant, $F(1,11171) = 36.92$, $p = 000$. R Square = 95.6% variance through all five models, indicating a positive correlation between the variables, and the model produces reliable and precise predictions for this research. Chi-Square supports a

significant independent association between the variables, and the odds ratio data denotes those students who were cyberbullied were 4.49 times likely to have suicidal behaviors. The null hypothesis was rejected p= .000, and the finding indicates a relationship between cyberbullying and suicidal behaviors.

An interesting bridging between Q4 "Are you Hispanic or Latino" and Q5 "What is your race" may affect the outcome of the data. Race is contextual, complicated, and a construct that requires all federal data to offer multiple responses and Hispanic/Latino can be connected to race separately or in combination (Liebler & Halpern-Manners, 2008). A similar issue occurs with Q2 "What is your sex" and Q67 "Which of the following best describes you, Sexual Identity." The YRBSS questionnaire cannot reflect the complexity of race/ethnicity correspondence nor the intent of the answer from the high school-aged respondent through a multiple-choice questionnaire. Understanding the complexity of the questions was important in interpreting the significance for each variable in Table 6 coefficients (cyberbullying p= 0.00), (sex p = 0.00, (race p = .997), (Hispanic/Latino p = .145), and (sexual identity p = 0.00).

Limitations of the Study

As mentioned earlier in this paper, there was a large gap in information and understanding regarding cyberbullying and suicidal behaviors. Olweus and Limber (2018) noted that the literature produced inconsistencies regarding the research findings, metanalysis, and concurrence on the association of cyberbullying and suicidal behaviors, unlike traditional bullying and suicidal behaviors.

This data was limited to U.S. high school-aged students who attend school and live in the United States. I did not consider students outside this age range who do not attend school (by choice, expelled, dropped out) or outside the United States. Even with several years of testing and reliability tests conducted for the YRBSS, the CDC noted that they could not account for over or under-reporting on any of these health questions (2017). The questions could be deemed as labeling (sex, race, etc.). Students may not have been willing to answer some of the question out of fear, uncertainty, a lack of definitions, or not having self-identified as one of the available options including the option other.

Defining cyberbullying for this paper was clear as it was a predefined question from the CDC YRBSS 2017 questionnaire. However, cyberbullying may mean something different for students by age, race, sex, region, etc. The term for some students could be limited to written text, pictures, videos, or all of these. Cyberbullying may have been interpreted as a blanket term, such as receiving a negative response(s), getting unliked by one person, not getting responses on a social media post, or receiving overtly aggressive abusive actions. The threshold for one person to call it cyberbullying may differ by time, such as occurring one-time or over a period. And the overlapping of cyberbullying and traditional bullying as a co-occurrence was another issue I considered.

Additionally, it was noted by the CDC that the SPSS software was somewhat more limited in its analysis of complex sample survey data when compared to SUDAN or STATA (2017). There were some discrepancies in the data counted by the SPSS software within this study compared to that number of students analyzed by CDC's STATA. The

SPSS software analyzed fewer sample surveys, and this was also noted on the CDC's website. However, the analysis was still accurate and was within the same percentages as the CDC's measures.

Recommendations

Technology and social media have evolved and grown over the last couple of decades. Societally, interactions with online media platforms vary by age, race, sex, and other variables. Young adults were the earliest adopters of social media and use it at the highest levels (Pew, 2021). U.S. high school-aged students were online 95% of the time, and of those teens online, 90% have one or more social media profiles (Herring & Kapidzic, 2015). As many as 95% of teens have access to a smartphone and were online 45% of the time (Anderson & Jiang, 2018). For perspective, many teens today do not know what it is not to have online access or not have a social media profile. They are digital natives who are no longer the students the educational system was designed to teach (Prensky, 2001). Today's student's social constructs have evolved in how they send/receive information, interact, and communicate. This does not mean it has to be viewed as a gap by generations, but rather an opportunity to bridge technological developments to devise new suicidal prevention strategies. It is vital to tailor preventative measures that reach this population. This could include programs, apps, sponsored online influencers who educate on the subject, and online 24 hour counselors (texting, audio, and/or video). Knowledge gained from this study should be made accessible to public health leaders, teachers, parents, children, stakeholders, and policymakers to reduce negative health outcomes. With the identified limitation and sensitivities surrounding

some questions, qualitative questionnaires could be used in smaller state-by-state research.

Implications for Professional Practice and Social Change

The number of students who had suicidal behaviors and/or were cyberbullied was disproportionately higher depending on sex, sexual identity, and race/ethnicity. There is a need for public health leaders, school leaders, and stakeholders to take the necessary actions required to decrease health-risk behaviors (cyberbullying and suicidal behaviors) and improve the overall health outcomes for high school-aged children. Prevention methods to reduce suicide in this vulnerable population have not been successful. It is during these years that children maneuver from childhood to adulthood. Many high school-aged students learn to successfully navigate their transition from childhood to adulthood during their high school years and go on to become productive members of society. However, some high school-aged students undergo negative health-risk behaviors as either the perpetrator or victim. Many subgroups defined by age, race, and sex are put at risk for premature morbidity and negative social behaviors (CDC, 2018). In this research, high school-aged students defined as SMY and those cyberbullied were found to be at a higher risk for suicidal behaviors and thus put into this at-risk subgroup.

Conclusion

In 2017 there were 2.17 million high school-aged students that were cyberbullied and 2.64 million that considered suicide. I used a SESPM theoretical foundation throughout the research process, keeping in mind that the numbers represented in this data were real people and that suicide rates have not changed over the last 20 years. The

intent of my research was to further the professional public health field and literature research adherent to cyberbullying and suicidal behaviors in high school-aged students in order to improve public health outcomes, reduce suicide, and further prevention efforts.

As previously mentioned, peer victimization (traditional bullying) has been identified as a risk factor for short/long-term negative health outcomes and suicidal behaviors. However, current studies do not have concurrence on the association between cyberbullying and suicidal behaviors. I did identify a moderate positive association between cyberbullying and suicidal behaviors and included a crosstabulation analysis for policymakers to review. I urge policymakers to include cyberbullying as part of their prevention programs and tailor the programs according to their specific region and demographics.

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