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HIV/STI Screening, Testing, and Prophylaxis Among Sexual Assault Survivors in U. S. Emergency Departments

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Walden University
2020

Abstract

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by

Elizabeth A. Cita, MSN, BS, RN

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Use of HIV screening/testing and prophylaxis has been found to be low in the general emergency department (ED) population. Less is known about the use of HIV/sexually transmitted infection (STI) screening, testing, and prophylaxis among sexual assault survivors who present to EDs. The main research questions asked whether there was a relationship between race, socioeconomic status (SES), geographic region, or age, HIV/STI, treatment, and prophylaxis among sexual assault survivors that present to U.S. EDs. This study was a secondary analysis of data collected in the NHAMCS years 2010 to 2016 and included 112 geographic primary sampling units, about 480 hospitals. The findings of this quantitative, cross-sectional study, informed using the socioecological framework, found that White sexual assault patients had a 3 times greater likelihood of receiving an HIV test than Black sexual assault patients. Sexual assault patients in the West have an 8.7 times higher lower likelihood of receiving an HIV test than do patients in the Northeast, despite having a lower number of sexual assaults. Sexual assault patients aged 0 to 10 have an 8 times lower likelihood of receiving appropriate HIV/STI medications for treatment or prophylaxis than the reference group. This new knowledge can contribute to positive social change through improved care of sexual assault patients, a potential decrease in the rate of HIV transmission, and a decrease in social cost and stigma. Findings from this research may promote protocols and specialized staff and influence policy, research, law, and support of evidence-based interventions to address the disparities outlined above.

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Dedication

To all sexual assault survivors; may you find healing, hope, and peace.

Acknowledgments

Thank you to my husband Mark T. Cita who sacrificed so that I might have the opportunity to do this research and pursue my doctorate in Public Health. I couldn't have done it without your love and support.

Thank you to Dr. Sri K. Banerjee, my chair and mentor, who led me out of the darkness and set me on the path of academic fulfillment. Your support and encouragement made all the difference. Thanks also to my committee member Dr. J. Khubchandani for your valuable feedback and advice.

Table of Contents

List of Tables

Section 1: Foundation of the Study and Literature Review

The surveillance and control of HIV and other sexually transmitted infections (STIs) is a public health priority in the United States (Centers for Disease Control and Prevention [CDC], 2018). Although this has resulted in an 11.7% decrease in HIV infections since 2010, there are still opportunities for improvement. In 2015, there were a total of 38,500 new cases of HIV estimated in the United States, with a prevalence of 418.7 per 100,000 and incidence of 7.9% (CDC, 2018). Other STIs are increasing. In 2015, the prevalence of chlamydia in the United States (among all ages, races, ethnicities, and male or female sex) was 475 per 100,000 and increased to 497.3 in 2016 (CDC, 2018). The rate of gonorrhea in the United States (among all ages, races, ethnicities, and male or female sex) also rose from 123 per 100,000 in 2015 to 145.8 per 100,000 in 2016 (CDC, 2018). The CDC and the United States Department of Health and Human Services (2016) recommended that all persons with a nonoccupational exposure who present a significant risk of HIV acquisition should be evaluated by a healthcare professional and offered nonoccupational postexposure prophylaxis (nPEP). Certain circumstances increase the risk of contracting HIV or other STIs (CDC, 2018). One circumstance that presents a significant risk of acquiring HIV/STIs is sexual assault (CDC, 2016; Draughon, 2012: Ghosh, Rodriquez-Garcia, & Wira, 2013).

Sexual assault itself is a serious public health problem (CDC, 2018). Definitions of rape and sexual assault and how data are collected vary widely. Prevalence statistics are thus difficult to interpret and are believed to be underestimates. Breiding et al. (2014), using data from the CDC's National Intimate Partner and Sexual Violence Survey,

estimated that there were 323,450 rapes and sexual assaults in 2011 or 1.2 per 100,000. The self-survey participants were 18 years and older and had not reported to law enforcement.

The United States Federal Bureau of Investigation (FBI) monitors rapes of all ages that have been reported to the police. In 2011, 83,425 forcible rapes of females were reported to law enforcement. The rate was 52.7 per 100,000. In December 2011, the FBI changed their definition of rape to "penetration, no matter how slight, of the vagina or anus with any body part or object, or oral penetration by a sex organ of another person, without the consent of the victim." The reference to females was removed. At present, some data are reported according to the legacy definition and some according to the new definition. The new definition has resulted in larger numbers. In 2015, rapes reported using the legacy definition were 91,261 or 28.4 per 100,000 (FBI, 2015). Rapes according to the new definition were 126,134 or 39.3 per 100,000 (FBI, 2015). In 2016, there were 130,618 according to the new definition or 40.4 per 100,000 (FBI, 2016). The Department of Justice National Crime Victims Survey is a self-report survey that collects data on both rape and sexual assault in persons age 12 and older that have not been reported to the police. In 2011, The Department of Justice National Crime Victims Survey reported 243,800 rapes and sexual assaults or 0.9 per 100,000 (as cited in Truman & Planty, 2012). In 2015, there were an estimated 431,840 events or 1.6 per 100,000 (Truman & Morgan, 2016). In 2016, there were 323,000 incidents or 1.2 per 100,000 (Morgan & Kena, 2017).

Some sexual assault survivors seek care in hospital emergency departments (EDs). A search of the WISQARS Nonfatal Injury Reports (2018) revealed that in 2011, there were 78,521 victims of injuries (all ages, races, genders) related to sexual assault or an age-adjusted rate of 26.3 per 100,000. In 2015, the number had increased to 80,590 or 26.6 per 100,000 (WISQARS, 2018). In 2016, there were 88,431 or a rate of 29.3 per 100,000 (WISQARS, 2018).

In the remainder of Section 1, I state the problem and the purpose of the study. The research questions are then listed. Next, I review the theoretical foundation and the nature of the study. The literature search strategy and literature review are included. Finally, study definitions, assumptions, scope, delimitations, and significance are discussed.

Problem Statement

Use of HIV screening/testing and prophylaxis has been found to be low in the general ED population (Ende, Hein, Sottolano, & Agins, 2008; Merchant & Catanzaro, 2009; Rothman et al., 2011). In the general population, Blacks had a 70.3% incidence of HIV testing in their lifetime of while Whites had only a 39.2% incidence (Lo, Runnels, & Cheng, 2018). Less is known about the use of HIV/STI testing and prophylaxis among sexual assault survivors who present to EDs. Amey and Bishai (2002) found a link between age and underuse; however, this did not completely explain their conclusion that many survivors are neither screened nor treated for HIV/STIs. Draughon et al. (2015) observed increased compliance where a standardized protocol existed and when the perpetrator was other than White race. In another study, researchers found that counseling

and prophylaxis were more likely to be received by those younger than 25 years of age, single, and employed among other factors, leading the authors to conclude that services were not extended to all survivors (Dumont, Van, Kosa, & MacDonald, 2017). Patel, Panchal, Piotrowski, and Patel (2008) and Patel, Roston, Tilmon, Stern, Roston, Patel, and Keith (2013) found that comprehensive medical care management of sexual assault was underused. Barriers to screening and treatment that have been identified to include personal comfort of physician providers, physician/patient communication, and health system obstacles (Amin, Buranosky, & Chang, 2016; Bakhru, Mallinger, & Fox, 2010). There are also myriad barriers surrounding medication acceptance and compliance (Dejelaj, Patterson, & Romero, 2017). Underuse and barriers may either contribute to or be the result of healthcare disparities and inequities related to social determinants.

Purpose of the Study

Building on prior research, in this quantitative study, I attempt to identify and describe other factors that influence whether sexual assault survivors are offered HIV/STI screening/testing and prophylaxis (dependent variables) in hospital EDs when they present for treatment. I specifically address the influence of the independent variables of race and SES status in adult (≥ 18) sexual assault survivors because this is a meaningful gap in the current research.

If healthcare disparities and inequities related to social determinants are identified, they can be addressed and thus inspire positive social change. Among these potential changes are improved prevention strategies, improved care of survivors of sexual assault as it relates to HIV/STI screening/testing and prophylaxis, a decreased rate

of HIV/STI transmission, a decreased economic burden of HIV and sexual assault aftercare, and less social stigma. It could also be a step to addressing the challenges of researching about sexual assault and increase the knowledge base in the field. Individuals, families, the community, and society can benefit, consistent with the socioecological theory upon which the study was based.

Original Research Questions and Hypotheses

The original main research questions were as follows:

Research Question (RQ)1: Is there a relationship between race (independent variable) and HIV/STI testing (dependent variable) among sexual assault survivors?

H_o1: There is not a significant relationship between race and HIV/STI testing among sexual assault survivors.

H_A1: There is a significant relationship between race and HIV/STI testing among sexual assault survivors.

RQ2: Is there a relationship between race (independent variable) and HIV/STI prophylaxis (dependent variable) among sexual assault survivors?

H_o2: There is not a significant relationship between race and HIV/STI prophylaxis among sexual assault survivors.

H_A2: There is a significant relationship between race and HIV/STI prophylaxis among sexual assault survivors.

RQ3: Is there a relationship between socioeconomic status (independent variable) and HIV/STI testing (dependent variable) among sexual assault survivors?

H_o3: There is not a significant relationship between socioeconomic status and HIV/STI testing among sexual assault survivors.

H_A3: There is a significant relationship between neighborhood socioeconomic status and HIV/STI testing among sexual assault survivors.

RQ4: Is there a relationship between socioeconomic status (independent variable) and HIV/STI prophylaxis received (dependent variable) among sexual assault survivors?

H_o4: There is not a significant relationship between socioeconomic status and HIV/STI prophylaxis received among sexual assault survivors.

H_A4: There is a significant relationship between socioeconomic status and HIV/STI among sexual assault survivors.

Final Research Questions and Hypotheses

The original research questions as stated above were changed in wording to better reflect the answers sought. Seven additional research questions were developed to reflect the identification and addition of possible significant variables during the course of the research. These changes were necessary to be flexible and make the best use of the sample size and characteristics. The lack of availability of some data also contributed to the need to alter the research questions and hypotheses slightly. The final research questions were as follows:

RQ1: Is there a statistically significant difference between races (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$1: There is not a statistically significant difference between race and HIV test received among sexual assault survivors in the ED.

H_A1: There is a statistically significant difference between races and HIV test received among sexual assault survivors in the ED.

RQ2: Is there a statistically significant difference between races (independent variable) and receipt of urine tests and/or pelvic exams (dependent variables) to diagnose sexually transmitted infections among sexual assault survivors in the ED?

$H_0$2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ3: Is there a statistically significant difference between races (independent variable) and receipt of HIV/STI medication treatment or prophylaxis (dependent variable) among sexual assault survivors in the ED?

$H_0$3: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A3: There is a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ4: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$4: There is not a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

H_A4: There is a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

RQ5: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections (dependent variable) among sexual assault survivors in the ED?

$H_0$5: There is not a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

H_A5: There is a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

RQ6: Is there a statistically significant difference between socioeconomic status (independent variable) and HIV/STI medication treatment or prophylaxis received (dependent variable) among sexual assault survivors in the ED?

$H_0$6: There is not a statistically significant difference between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

H_A6: There is a statistically significant difference between socioeconomic status and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ7: Is there a statistically significant difference between geographic region (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0 7$: There is not a statistically significant difference between geographic region and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

$H_A 7$: There is a statistically significant difference between geographic region and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ8: Is there a statistically significant difference between geographic region (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0 8$: There is not a statistically significant difference between geographic region and HIV tests received among sexual assault survivors in the ED.

$H_A 8$: There is a statistically significant difference between geographic region and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ9: Is there a statistically significant difference between geographic region (independent variable) and receipt of appropriate medications (dependent variable) among sexual assault survivors in the ED?

$H_0$9: There is not a statistically significant difference between geographic region and appropriate medications received among sexual assault survivors in the ED.

H_A9: There is a statistically significant difference between geographic region and appropriate medication received among sexual assault survivors in the ED.

RQ10: Is there a statistically significant difference between age (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0$10: There is not a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

H_A10: There is a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ11: Is there a statistically significant difference between age (independent variable) and appropriate medication received (dependent variable) among sexual assault survivors in the ED?

$H_0$11: There is not a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

H_A11: There is a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

Theoretical Foundation for the Study

Ecological theories are sets of related concepts that provide a systematic way of looking at relationships among variables (Glanz, Rimer, & Viswanath, 2015). Ecological models, which are influenced by multiple theories, attempt to explain and predict specific

problems in specific settings (Glanz et al., 2015). They are useful for conceptualizing the many different levels of influences on health behavior (Glanz et al., 2015). The main theory underlying ecologic models is that behavior has multiple levels of influence and that all levels of influence are important (Glanz et al., 2015). A second principle is that behavior settings restrict the range of a person's behavior, thus influencing it under certain circumstances (Glanz et al., 2015). Further, influences interact across the levels (Glanz et al., 2015). Another important principle is that interventions are more powerful when they focus on a specific behavior and occur on multiple levels (Glanz et al., 2015).

The ecologic model was appropriate for this study because I aimed to identify and describe the specific problems or behaviors that influence whether sexual assault survivors are offered HIV/STI screening/testing and prophylaxis in the specific setting of the hospital EDs. The CDC (2018b) uses this model for their violence prevention model. There are four levels: individual, relationship, community, and societal (CDC, 2018).

In this study, the sexual assault survivor or patient is on the individual level. Factors to be identified include race and SES status. To be identified are any other factors that increase the likelihood that HIV/STI prophylaxis will or will not be offered and/or accepted and complied with. On the relationship level are the individual's family and/or support systems and social capitol, which may or may not influence their ability to accept and comply with treatment. The health care provider develops a relationship with the sexual assault survivor as well; however, their setting of the hospital ED makes it also on the community level. Policy changes to intervene on this level may affect the lived experience of the sexual assault survivor and the practice of the health care provider. In

this study, I touch the societal level by exploring whether social norms about race and SES support or hinder care and whether there is inequality among groups.

Ecologic models have been used in public health for decades. Results of this study could result in identification of areas to intervene in the tradition of ecologic models of health behavior, health promotion, and multilevel structural change (see Glanz et al., 2015). A strength of the ecologic model is the study of multilevel influences (Glanz et al., 2015). Policy or environment changes can help sustain behavior change on the individual and community levels (Glanz et al., 2015).

A weakness of ecologic models is that they can be more demanding to work with and difficult to test (Glanz et al., 2015). They can also be costly and impractical when interventions are needed on multiple levels (Glanz et al., 2015). Overall, however, ecologic models are simple in that they recognize that individuals and communities cannot sustain healthy behaviors without policy and environmental support.

Nature of the Study

The study was a quantitative cross-sectional survey design using secondary data from the National Hospital Ambulatory Medical Care Survey (NHAMCS). The survey design enabled me to rapidly make inferences about the population of sexual assault survivors. Further, it was pragmatic and economical in form. The key study variables were whether the influence of the independent variables of race and SES had a relationship to whether adult (≥ 18) sexual assault survivors are offered HIV/STI screening/testing and prophylaxis (dependent variables) in hospital EDs in the United States.

Descriptive statistics were computed using SPSS. Frequencies were run on all variables. As part of logistic regression, Chi-square analysis of the measurement variables was done to test their significance.

Literature Search Strategy

Walden University and Saint Luke's Health System Libraries were used. Databases and search engines used included EBSCO, PubMed, CINAHL, MEDLINE, ProQuest, OVID, Open Athens, and Google. Key search terms and combinations of search terms included *sexual assault, sexual abuse, rape, HIV, STI, gonorrhea, chlamydia, forensic nursing, post exposure prophylaxis, nonoccupational post exposure prophylaxis, emergency department service use, sexually transmitted disease, emergency department, trichomoniasis,* and *bacterial vaginosis*. The scope of literature review was primarily the last 16 years.

Literature Review Related to Key Variables and/or Concepts

In the following review, I focus on research that addressed the dependent variable: HIV/STI screening/testing, treatment, and prophylaxis in sexual assault survivors in EDs in the United States. Some were chosen because they used the NHAMCS database, which was the source of data for the study. Some were chosen because they used similar methodology and/or analytical techniques as the I did. Some were chosen as models for the study. In the following paragraphs, I describe in chronological order how the problem has been approached thus far and the strengths and weaknesses of previous studies. Through review and synthesis of these studies, the research question and the selection of the variables in the study are justified.

Amey and Bishai (2002) set the precedent for studying the quality of services extended to victims of sexual assault. Although their study was limited to women, it provided a foundation and rationale for studying the experience of those who present to EDs after sexual assault (Amey & Bishai, 2002). The variables of HIV/STI screening and treatment, race, and payor status were among those studied and provided a baseline for comparison by this study. The study also helps to establish that numbers of patients presenting with sexual assault are consistent with those reported to law enforcement, thus informing future studies and helping to identify the prevalence. The NHAMCS is the database from which Amey and Bishai derived the study sample, as did I in this study. The independent variable of race was studied, and the study found that Black women received more services. Limitations of the study and using the national database included possible coding errors, being limited to information abstracted, difficulty in capturing transfer patients, a lower sample size, and the inability to address psychosocial aspects of care and follow up (Amey & Bishai, 2002). Overall, Amey and Bishai provided a template for this study.

In 2008, three studies addressed the provision of services to sexual assault patients in EDs on the state level. Ende et al. (2008) studied one aspect of care: initiation of nPEP. Merchant, Phillips, DeLong, Mayer, and Becker (2008) studied disparities in the provision of HIV/STI testing and prophylaxis for women sexually assaulted and presenting in Rhode Island EDs. In Illinois, the comprehensive medical care of sexual assault victims in EDs including HIV/STI management was studied by Patel, Panchal, Piotrowski, and Patel (2008). All concluded that guidelines for care of sexual assault

victims were under implemented and services were underprovided to varying degrees. Merchant et al. used a logistic regression model for analysis, which I also used in this study. These state studies may not be generalizable to other states or the national level.

Bakhru et al. (2010) also informed, supported, and justified my study by identifying potential barriers to postexposure prophylaxis for sexual assault victims in EDs, specifically treatments and attitudes of ED physicians. Rothman et al. (2011) also informed and supported this study by finding in their national web-based survey that most ED programs did not have systematic HIV testing programs for anyone. In 2018, Niferatos et al. reinforced these findings by their study of ED patients who received HIV/STI laboratory testing, including sexual assault patients. In those cases, a lack of documentation of a complete sexual history was identified as a barrier to care and associated with suboptimal testing and treatment (Niferatos et al., 2018).

The hypothesis of increased risk of HIV transmission among sexual assault victims (Draughon, 2012) is a central concept underpinning the research problem that supported and informed this research project. Draughon and Sheridan (2012) studied part of the dependent variable, nPEP evaluation in sexual assault survivors, and found there to be a need for further research to better understand the process. Draughon, Anderson, Hansen, and Sheridan (2014) reaffirmed that finding in a survey of Sexual Assault Nurse Examiner programs and Forensic Nurse Examiners programs studying nPep. These justified the need for this study, which builds on and adds to this body of research. In a similar study, in 2015, Draughon et al. looked at nurses offering nPEP post sexual assault. They also used similar methodology and analysis techniques as I did. Jaureguy,

Chariot, Vessieres, and Picard (2016) studied an adult and adolescent sexual assault population outside Paris, France. They found that Chlamydia trachomatis was present in 15% of patients and Neisseria gonorrhea was present in 5% (Jaureguy et al., 2016). Three percent of patients had both Chlamydia trachomatis and Neisseria gonorrhea (Juareguy et al., 2016). The only study not affirming that sexual assault was associated with higher rates of HIV and STI was done by Van Rooijen, Schim van der Loeff, van Kempen, and DeVries (2018). The researchers found that female sexual assault survivors had a positive STI rate of 11.2% while nonvictims had a rate of 11.6% (Van Rooijen et al., 2018). Survivors did not have increased odds of getting a STI either (Van Rooijen et al., 2018).

Very little has been studied in relation to male victims of sexual assault. Du Mont, Macdonald, White, and Turner (2013) studied the use of services in male clients in Canada and found acceptance, including HIV/STI testing. They identified a need for further research, which helped justify my study that addressed both the male and female gender. The same year, a study of females receiving comprehensive medical care management for sexual assault (which includes HIV/STI screening and treatment) found that less than 1/5th of U.S. hospitals complied (Patel et al., 2013). In 2014, Krause et al. examined then current practices in EDs, finding that 100% of eligible candidates were offered HIV/STI testing in their sample of 138. Malverni, Libois, Gennotte, LaMorté, and Mols (2016) determined that only 60% of emergency physicians in their Belgian study complied with prescribing guidelines. Of those prescriptions, nearly all were appropriate, but compliance with treatment was poor in sexual assault survivors (Malverni et al., 2016). Tapesana et al. (2017) found that suboptimal care including HIV/STI prophylaxis,

testing, and treatment was given to sexual assault patients over a 2-year period. Muriuki, Kimani, Machuki, Kiarie, and Roxby (2017), in a Kenyan study that included sexual assault survivors of all ages, found PEP given in only 54%, with 34% completing treatment. Use of violence services was compared between intimate partners and other sexual assault survivors by DuMont, Woldeyoyohannes, Macdonald, Kosa, and Turner (2017), including STI prophylaxis and HIV PEP counseling. The authors found that those involved in intimate partner violence were less likely to partake in services DuMont et al., 2017). DuMont et al. also had a similar focus and methods as this study. DuMont et al. (2017) also looked specifically at HIV PEP counseling just in the intimate partner violence survivor. Limitations included differences in data collection, self-report bias, limited generalizability, and failure to include a multivariate analysis (DuMont et al., 2017). Monuteaux, Fleegler, and Lee (2017) informed, supported, and justified my study as well by helping to establish the scope of the problem and quantify the cost. Monuteaux et al., 2017 used the National Hospital Ambulatory Medical Care Survey-ED from 2000 to 2010, the limitations of which were previously noted. The analysis methods of Monuteaux et al. were similar to my study methods and analysis techniques, including regression logistics. Scanell, Kim, and Guthrie (2018) looked at the acceptance of HIV postexposure prophylaxis in the sexual assault population. As did almost every other study, Scanell et al. showed deficiency in health care delivery of nPep in EDs.

In summary, the above synthesis along with information from other sources served as a foundation for further research into the provision of HIV/STI screening, treatment, and prophylaxis among sexual assault survivors. The previous studies that

used the same dependent variable as I did also provide a foundation and tradition. Many of the studies used the same database, methodology, and analytic techniques as me, yet new knowledge can be gained by studying this variable in relation to age and SES .

Study Definitions and Assumptions

The dependent variable was HIV/STI screening, testing, treatment, or prophylaxis. HIV/STI screening is recommended for all victims of sexual assault (CDC, 2016). Testing may not be desired or efficacious in all circumstances and thus should be considered on a case by case basis (CDC, 2016). For example, a sexual assault patient is unlikely to test positive for an STI on the same day as the assault. The patient may opt to accept treatment without testing based on risk factors. Further, positive results might indicate a preexisting STI, which defense attorneys may use to discredit the victim if their case is adjudicated (CDC, 2016). Postexposure prophylaxis for HIV requires some testing and should also be decided considering risk factors and the patient's ability to comply with the regimen (CDC, 2016).

The independent variables were race and SES. Race as a biological concept has no clear or effective definition for humans, while in practice, race is socially defined. Races were defined according to Directive # 15 of the Office of Management and Budget Race and Ethnic Standards for Federal Statistics and Administrative Reporting (1977) as follows:

> White is a person having origins in any of the original peoples of Europe, North Africa, or the Middle East, Black/African American is a person having origins in any of the black racial groups of Africa, Asian and Hawaiian/Other Pacific

> Islander is defined as a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands,
>
> American Indian or Alaska Native is a person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition (p. 1).

Race was coded as follows: 1 = White, 2 = Black/African American, 3 = Asian, 4 = Native Hawaiian/Other Pacific Islander, 5 = American Indian/Alaska Native, 6 = More than one race reported, and -9 = race left blank.

Socioeconomic status (SES) will be assumed from expected source of payment. Private Pay/insurance, Medicare, and Workman's Compensation will be considered high SES. Medicaid, Self-pay, and No Charge will be considered low socioeconomic status. Blank, Unknown, and Other were excluded from the final analysis by SPSS. These assumptions are necessary because the database does not specifically record income.

Scope and Delimitations

As the proposed study is not experimental, threats to internal and external validity are confined to selection. Participants will be selected because they have been sexually assaulted, and this may predispose them to certain outcomes (Creswell, 2009). For example, some people who are sexually assaulted belong to high risk groups (e.g. IV drug user) which makes them higher risk for HIV/STIs.

The proposed study will use data from adults (defined as equal to or greater than 18 years of age). This is because HIV/STI protocols vary significantly for children and

adolescents (CDC, 2016). The study participants will be male and female sex because the NHAMCS database collects it that way (NHAMCS, 2015). Persons who present to the ED greater than 72 hours after the assault will be excluded because HIV protocols require presentation within 72 hours for prophylaxis (CDC, 2016). These measures will help to support construct validity. Because the study outcomes are meant to benefit a specific population, generalizability is not a primary concern.

Significance, Summary, and Conclusions

A potential contribution of the proposed study would be to test the findings of Amey and Bishai (2002) that Black/African-American women received more HIV/STI services than did white women. The proposed study would also expand and further define who is receiving services by including Asian, Native Hawaiian/Other Pacific Islander, American Indian/Alaska Native, and more than one race reported. The study also may point to opportunities for improvement for service providers, particularly if patient acceptance is influenced by provider type and approach. The presence or absence of standardized protocols and degree of implementation or compliance may also affect patient acceptance.

The over-arching theme of the literature, and what is well known, is that victims of sexual assault are not receiving all the services that they are eligible for in U.S. EDs. If any insight can be made into the demographics or behavior of the population or the caregivers a potential for positive social change exists consistent with the scope of the study. This study would fill gaps in the current literature and extend knowledge in the field.

Section 2: Research Design and Data Collection

In this study, I attempted to identify and describe factors that may have influenced whether sexual assault survivors were offered HIV/STI screening/testing and prophylaxis (dependent variables) in hospital EDs when they presented for treatment. Independent variables of interest were race, socioeconomic status, geographic region, and age. In this chapter, I discuss the research design and rationale for the study. I also describe the methodology, including population, sampling and sampling procedures, operationalization of the variables, and the data analysis

Research Design and Rationale

A quantitative approach was appropriate because I used numeric data to generalize about the characteristics of sexual assault survivors seen in United States EDs from 2010 to 2016 so that inferences could be made about their needs (see Aschengrau & Seage, 2014; Creswell, 2009). The cross-sectional design was appropriate because secondary data were analyzed. Generalizability, speed, and low cost are advantages of secondary data analysis (Aschengrau & Seage, 2014). The data were collected by record review. Logistic regression was appropriately used because I was able to place individuals into categories, and the dependent variables were binary (yes/no) for HIV/STI screening, testing, and prophylaxis.

Methodology Population

The original study population was participants in the National Hospital Ambulatory Medical Care Surveys 2010 to 2016. The total number of patient records reviewed was 159. Cases were identified as sexual assault survivors by, reason for visit

codes 58300 (adult sexual abuse) and 58301 (child sexual abuse), and/or diagnosis code V71.5 (observation after alleged rape or sexual assault) and/or cause or E code 9601.0 (rape). Originally, patients under 18 or who presented greater than 72 hours after the assault were to be excluded, but they were ultimately included in order to obtain a larger sample size. Because the data were secondary data, there were no means to identify individuals in the population. It was necessary to arrange the data so that they were easier to work with. All data manipulation and statistical analyses were done using SPSS. The target population size was expected to be small because of well-known issues with reporting and documentation of sexual violence, as previously described. Potential for identifying patients exists through cross checking records of patients who receive HIV/STI screening/testing and treatment/prophylaxis medications.

Sampling Procedures

The Raosoft® sample size calculator was used to determine an a priori adequate sample size with a 95% confidence level (CL). One-hundred fifty-nine records that met the identification criteria were identified. A response distribution was estimated at 50% because there was no clear expectation of what the results would be. Therefore, 113 records would have been required for adequate power. All 159 records were ultimately included. If other factors had excluded records, the size could have been recalculated or, if necessary, a compromise analysis could have been done if an ideal sample size could not have been assembled. Surveying a representative random sample was the preferred method of data collection for this study because of the ease and rapidity of collection and

lower/no cost (see Creswell, 2009). Inclusion criteria was ICD 9 codes 58300, 58301, V71.5, or 9601 as noted above.

NHAMCS (2015) estimates are considered reliable when each is based on 30 unweighted records and the weighted data had a relative standard of error of less than 30%. Unweighted records are only used for determining the sample number. Weighted data were used to make national estimates. The secondary data set that I used was the NHAMCS.

> The NHAMCS is an annual, national probability sample of ambulatory visits made to nonfederal, general, and short-stay hospitals in the U.S. conducted by the Centers for Disease Control and Prevention, National Center for Health Statistics…. hospitals are inducted into the NHAMCS by field representatives of the U.S. Census Bureau. Hospital staff or Census Bureau field representatives complete a patient record form for each sampled visit based on information obtained from the medical record. (NHAMCS, 2018, p. 1)

In this analysis, I focused solely on ED visits. NHAMCS is a public access database. Permission was not required for the data that were used for this study.

Operationalization

There were ultimately four, numeric type independent variables. The independent variables were race, socioeconomic status, geographic region, and age. The dependent variables were HIV/STI screening, testing, treatment, or prophylaxis. All variables were nominal. Numbers are used to classify objects or put them into categories and have no quantitative meaning (Polit & Beck, 2010). For example, no services provided was coded

as 0, HIV/STI screening provided was coded as 1 and so on. Percentages indicated the number of patients receiving services and what services those were.

Data Analysis Plan

Sample visit weight was used to analyze data at all stages of the sample design (see NHAMCS, 2015). The sampling weights were adjusted for survey nonresponse within a set of parameters, which yielded an unbiased national estimate of ED visits, percentages, and characteristics (see NHAMCS, 2015). SPSS was used for analysis in this study. Missing data were cleaned and controlled for as appropriate. The final research questions as noted in Section 1 were:

RQ1: Is there a statistically significant difference between races (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$1: There is not a statistically significant difference between race and HIV test received among sexual assault survivors in the ED.

H_A1: There is a statistically significant difference between races and HIV test received among sexual assault survivors in the ED.

RQ2: Is there a statistically significant difference between races (independent variable) and receipt of urine tests and/or pelvic exams (dependent variables) to diagnose sexually transmitted infections among sexual assault survivors in the ED?

$H_0$2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ3: Is there a statistically significant difference between races (independent variable) and receipt of HIV/STI medication treatment or prophylaxis (dependent variable) among sexual assault survivors in the ED?

H_03: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A3: There is a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ4: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

H_04: There is not a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

H_A4: There is a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

RQ5: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections (dependent variable) among sexual assault survivors in the ED?

$H_0$5: There is not a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

H_A5: There is a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

RQ6: Is there a statistically significant difference between socioeconomic status (independent variable) and HIV/STI medication treatment or prophylaxis received (dependent variable) among sexual assault survivors in the ED?

$H_0$6: There is not a statistically significant difference between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

H_A6: There is a statistically significant difference between socioeconomic status and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ7: Is there a statistically significant difference between geographic region (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$7: There is not a statistically significant difference between geographic region and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

H_A7: There is a statistically significant difference between geographic region and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ8: Is there a statistically significant difference between geographic region (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0 8$: There is not a statistically significant difference between geographic region and HIV tests received among sexual assault survivors in the ED.

$H_A 8$: There is a statistically significant difference between geographic region and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ9: Is there a statistically significant difference between geographic region (independent variable) and receipt of appropriate medications (dependent variable) among sexual assault survivors in the ED?

$H_0 9$: There is not a statistically significant difference between geographic region and appropriate medications received among sexual assault survivors in the ED.

$H_A 9$: There is a statistically significant difference between geographic region and appropriate medication received among sexual assault survivors in the ED.

RQ10: Is there a statistically significant difference between age (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0 10$: There is not a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

H_A10: There is a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ11: Is there a statistically significant difference between age (independent variable) and appropriate medication received (dependent variable) among sexual assault survivors in the ED?

$H_0 11$: There is not a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

$H_A 11$: There is a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

Descriptive statistics were completed. Frequencies were run on all variables. Chi-square was done as part of binomial logistic regression. Binomial logistic regression was done to predict outcomes based on characteristics of the population served. A 95% CL was desired as stated under sampling.

Threats to Validity

The NHAMCS results have sampling and nonsampling errors. Errors included reporting and processing errors and nonresponse and incomplete response bias (NHAMCS, 2015). In addition, race data were missing from some records (NHAMCS, 2015). As stated previously, this study was not experimental; therefore, threats to internal and external validity were confined to selection. No threats to construct or statistical validity were identified.

Ethical Procedures

Access to the portion of the NHAMCS being used for this study was open to the public for downloading in various formats. Additional data were available from the Research Data Center at the National Center for Health Statistics, which requires an approval process for access. NHAMCS falls under Title 42, United States Code, Section 242K, which allows data collection for health research. All information is only used for statistical purposes and is anonymous and confidential (NHAMCS, 2018). Institutional review board procedures for this study were followed as required. The IRB approval number was 08-28-19-0251965. There were no potential ethical concerns related to human participants and no other ethical issues were identified.

Summary

In this study, I attempted to identify and describe factors that may have influenced whether sexual assault survivors were offered HIV/STI screening/testing and prophylaxis in hospital EDs when they presented for treatment. A quantitative approach and cross-sectional design were appropriate. The original study population was the participants in the NHAMCS 2010-2016. Sampling procedures were followed. Variables were identified and defined. A data analysis plan was developed and implemented. Threats to validity and ethical issues were considered.

Section 3: Presentation of the Results and Findings

The purpose of this research was to identify and describe factors that influence whether sexual assault survivors were offered HIV/STI screening or testing, and/or treatment/prophylaxis (dependent variables) in hospital EDs when they presented for

care. Specifically, I looked at the influence of race, socioeconomic status, geographic region, and age (independent variables). Data from 2010 through 2016 was used. The sample size was 159. The Raosoft® sample size calculator was used to determine that a sample size of at least 113 was required for adequate power.

Sexual assault survivors were identified by reason for visit codes 58300 (adult sexual abuse) and 53001 (child sexual abuse) and/or diagnosis code V71.5 (observation after alleged rape or sexual assault) and/or cause E code 9601 (rape). Definitions of race remained the same; however, only Black and White races were used in the final sample because there was not a large enough number of the other races to perform regression. Socioeconomic definitions and assumptions were the same.

Participants were divided into two groups. People with private insurance, Medicare, or Workman's Compensation were assumed to have high income. People with Medicaid, self-pay, and no charge were assumed to have low income. Records that had methods of payment as other, blank, and unknown were excluded from the socioeconomic questions.

The lack of availability of certain data contributed to the need to alter the research questions and hypotheses slightly from the original as noted in Section 1. For example, there were data available for HIV screening/testing specifically, but not for other STIs. I assumed that screening/testing for STIs was done if any urine was tested or pelvic exam done. I also assumed that treatment/prophylaxis was received by patients who received antibiotics, anti-HIV drugs, Plan B emergency contraception, or vaccines that are normally part of a sexual assault treatment protocol.

The main research questions and hypotheses were:

RQ1: Is there a statistically significant difference between races (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$1: There is not a statistically significant difference between race and HIV test received among sexual assault survivors in the ED.

H_A1: There is a statistically significant difference between races and HIV test received among sexual assault survivors in the ED.

RQ2: Is there a statistically significant difference between races (independent variable) and receipt of urine tests and/or pelvic exams (dependent variables) to diagnose sexually transmitted infections among sexual assault survivors in the ED?

$H_0$2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A2: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ3: Is there a statistically significant difference between races (independent variable) and receipt of HIV/STI medication treatment or prophylaxis (dependent variable) among sexual assault survivors in the ED?

$H_0$3: There is not a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

H_A3: There is a statistically significant difference between races and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections among sexual assault survivors in the ED.

RQ4: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$4: There is not a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

H_A4: There is a statistically significant difference between socioeconomic status and HIV test received among sexual assault survivors in the ED.

RQ5: Is there a statistically significant difference between socioeconomic status (independent variable) and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections (dependent variable) among sexual assault survivors in the ED?

$H_0$5: There is not a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

H_A5: There is a statistically significant difference between socioeconomic status and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections received among sexual assault survivors in the ED.

RQ6: Is there a statistically significant difference between socioeconomic status (independent variable) and HIV/STI medication treatment or prophylaxis received (dependent variable) among sexual assault survivors in the ED?

$H_0$6: There is not a statistically significant difference between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

H_A6: There is a statistically significant difference between socioeconomic status and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ7: Is there a statistically significant difference between geographic region (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED?

$H_0$7: There is not a statistically significant difference between geographic region and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

H_A7: There is a statistically significant difference between geographic region and between socioeconomic status and HIV/STI medication treatment or prophylaxis received among sexual assault survivors in the ED.

RQ8: Is there a statistically significant difference between geographic region (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0$8: There is not a statistically significant difference between geographic region and HIV tests received among sexual assault survivors in the ED.

H_A8: There is a statistically significant difference between geographic region and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ9: Is there a statistically significant difference between geographic region (independent variable) and receipt of appropriate medications (dependent variable) among sexual assault survivors in the ED?

$H_0$9: There is not a statistically significant difference between geographic region and appropriate medications received among sexual assault survivors in the ED.

H_A9: There is a statistically significant difference between geographic region and appropriate medication received among sexual assault survivors in the ED.

RQ10: Is there a statistically significant difference between age (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED?

$H_0$10: There is not a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

H_A10: There is a statistically significant difference between age and urinalysis or pelvic exam received among sexual assault survivors in the ED.

RQ11: Is there a statistically significant difference between age (independent variable) and appropriate medication received (dependent variable) among sexual assault survivors in the ED?

$H_0$11: There is not a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

H_A11: There is a statistically significant difference between age and appropriate medications received among sexual assault survivors in the ED.

In the rest of this section, I outline the time frame for data collection. I also describe recruitment and response rates of the secondary data set. Baseline descriptive and demographic characteristics of the sample, as well as how representative of the population the sample is, are reported. I also report basic statistics and analyses, including tables.

Data Collection of Secondary Data Set

This study was a secondary analysis of data collected in the NHAMCS years 2010 to 2016. The annual survey has been conducted since 1992. These data focus on visits to hospital EDs. Information is obtained from the patient's medical record. The sample design was composed of multiple stages that include 112 geographic primary sampling units, about 480 hospitals within the sampling units, and patient visits to the EDs (NHAMCS, 2016). The survey items collected included demographics, reasons for visits, cause of injury, diagnosis, diagnostic tests ordered, and medications given or prescribed.

Table 1 lists the approximate percent of sampled hospitals that participated each year and provided complete information and a total unweighted response rate for each of the years used in this study.

Table 1

Percentage Participation and Unweighted Response Rate

Year	Conducted	% participation	Unweighted response rate	# of participants current study
2010	12-28-09 to 12-26-10	92%	87.5%	30
2011	12-27-10 to 12-25-11	87%	80.4%	16
2012	12-26-11 to 12-28-12	76.3%	63.6%	28
2013	12-24-12 to 12-22-13	80.8%	65.8%	22
2014	12-23-13 to 12-21-14	75.5%	60.6%	26
2015	12-29-14 to 12-27-15	70.8%	55.1%	21
2016	12-28-15 to 12-25-16	73.4%	51.7%	16

NHAMCS is approved every year by the Ethics Review Board and the requirements for informed consent of patients and patient authorization for release of medical records are waived (NHAMCS, 2016). Data processing is performed by SRA International, Inc., Durham, NC. Error rates usually range between 0.3% and 0.9% (NHAMCS, 2016, p.1). NHAMCS data were analyzed using the sampled visit weight which were adjusted for survey nonresponse resulting in a nonbiased national estimate of ED visit characteristics (NHAMCS, 2016).

Results and Findings

In Table 2, the sample age range and mean are reported. Table 2

Sample Age Range and Mean

Sample *n*	Range	Mean
159	1-60	23.47

In Table 3 baseline descriptive and demographic characteristics of the sample are reported.

Table 3

Full Sample Baseline Descriptive and Demographic Characteristics

Baseline characteristic	*n*	*%*
Sex		
Female	133	83.6
Male	26	16.4
Total	159	100%
Race		
Blank*	35	22
White only	87	54.7
Black/ African American only	35	22
More than one race reported	2	1.3
Recoded expected primary source of payment		
Unknown*	23	14.5
Private insurance	38	23.9
Medicare	7	4.4
Medicaid	61	38.4
Worker's compensation	2	1.3
Self-Pay	18	11.3
No charge	7	4
Other*	3	2
Geographic region		
Northeast	37	17.6
Midwest	37	18.9
South	57	25.8
West	28	13.8

*Excluded from final analysis using SPSS

In Table 4 the final sample characteristics and numbers are described. Table 4

Final Sample Racial, Socioeconomic, Geographic Region, and Age Categories

Baseline characteristic	*n*	*%*
Race*		
White only	87	71.3
Black/African American only	35	28.7
Total	122	100
Socioeconomic status (SES)**		
Low SES	79	62
High SES	47	38
Total	126	100
Geographic region		
Northeast	37	23.3
Midwest	37	23.3
South	57	35.8
West	28	17.6
Total	159	100
Age groups		
Group 0-10	23	14.5

Group 11-20	51	32.1
Group 21-30	41	25.8
Group 31-40	28	17.6
Group 41-50	9	5.7
Group 51-60	7	4.4
Total	159	100

*There was not a large enough sample of the other races to perform regression. See page 28. ** Recoded Expected Primary Sources of Payment were divided into high and low socioeconomic status for the final analysis and missing data was excluded. See page 28.

A binomial logistic regression was performed to ascertain the effects of race on the likelihood that sexual assault patients who present to the Emergency Department will receive HIV/STI screening, treatment, or prophylaxis. All variables were nominal so tests of linearity were not required. Further, there was no multicollinearity or significant outliers. Of the four predictor variables only one was statistically significant: HIV test (as shown in Table 5). Whites had 3 times higher likelihood to receive HIV tests than Blacks/African Americans. None of the other variables were significant.

Table 5

*Research Question 1: Binomial Logistic Regression Predicting Likelihood of Receiving HIV/STI Screening Based on Race**

	b	SE	Wald	*df*	*p*	*OR*	95% CI Lower	Upper
HIV(1) White	-1.099	.523	4.413	1	.036	.333	.120	.929

* $\chi 2(4) = 4.320$, $p < .05$. Nagelkerke R2= 5 % Correctly classified 71% of cases.

Table 6

*Research Question 2: Binomial Logistic Regression Predicting Likelihood of Receiving Urinalysis or Pelvic Exam Based on Race**

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Urinalysis	.662	.432	2.347	1	.125	1.939	.831	4.522

Pelvic Exam Females	.140	.564	.062	1	.804	1.151	.381	3.478

**Urine $\chi 2$*(4) = 2.542, $p < .05$. Nagelkerke R2= 3 % Correctly classified 61% of cases.
Pelvic $\chi 2$(4) = .063, $p < .05$. Nagelkerke R2= 0 % Correctly classified 84% of cases.

Table 7

*Research Question 3: Binomial Logistic Regression Predicting Likelihood of Receiving Appropriate Drug Prophylaxis or Treatment Based on Race**

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Medication	-.358	.402	.795	1	.373	.699	.318	1.536

* $\chi 2$(4) = .796, $p < .05$. Nagelkerke R2= 0 % Correctly classified 56% of cases.

A binomial logistic regression was performed to ascertain the effects of socioeconomic status on the likelihood that sexual assault patients who present to the Emergency Department will receive HIV/STI screening, treatment, or prophylaxis. All variables were nominal so tests of linearity were not required. Further, there was no multicollinearity or significant outliers. Of the four predictor variables none were statistically significant: HIV test (as shown in Table 9). was near significant and might have been more so with a larger sample.

Table 8

*Research Question 4: Binomial Logistic Regression Predicting Likelihood of Receiving HIV/STI Screening Based on Socioeconomic Status **

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
HIV(1) High SES	1.489	.784	3.608	1	.057	4.432	.954	20.593

* $\chi 2$(4) = 5.586, $p < .05$. Nagelkerke R2= 6 % Correctly classified 87% of cases.

Table 9

*Research Question 5: Binomial Logistic Regression Predicting Likelihood of Receiving Urinalysis or Pelvic Exam Based on Socioeconomic Status**

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Urine	-.502	.374	1.806	1	.179	.605	.291	1.259
Pelvic Exam (Females)	-.291	.482	.365	1	.546	.747	.290	1.922

**Urine* $\chi 2(4) = 3.111$, $p < .05$. Nagelkerke R2= 3 % Correctly classified 62% of cases.
Pelvic $\chi 2(4) = .063$, $p < .05$. Nagelkerke R2= 3 % Correctly classified 62% of cases.

Table 10

Research Question 6: Binomial Logistic Regression Predicting Likelihood of Receiving Drug Treatment or Prophylaxis Based on Socioeconomic Status

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Medication	.101	.370	.075	1	.785	.904	.438	1.866

A binomial logistic regression was performed to ascertain the effects of geographic region on the likelihood that sexual assault patients who present to the Emergency Department will receive HIV/STI screening, treatment, or prophylaxis. All variables were nominal so tests of linearity were not required. Further, there was no multicollinearity or significant outliers. The Northeast was used as the reference category. Of the four predictor variables only one was statistically significant: HIV test (as shown in Table 11). Patients in the West had 8.7 times more likelihood to receive HIV tests than patients in the Northeast, despite having 25% less cases. None of the other variables were significant.

Table 11

*Research Question 7: Binomial Logistic Regression Predicting Likelihood of Receiving HIV Test Based on Geographic Region**

	b	SE	Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
Northeast	Reference		5.745	3	.125			
West	2.161	1.088	3.944	1	.047	8.679	1.029	73.215
South	1.440	1.126	1.634	1	.201	4.219	.464	38.352
Midwest	1.156	1.106	10.475	1	.296	3.176	.363	27.759

* $\chi 2(4) = 6.770$, $p < .05$. Nagelkerke R2= 8% Correctly classified 87% of cases.

Table 12

*Research Question 8: Binomial Logistic Regression Predicting Likelihood of Receiving Urinalysis Based on Geographic Region**

	b	SE	Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
Northeast			1.904	3	.593			
West	-.129	.504	.065	1	.788	.879	.328	2.359
South	-.470	.512	.843	1	.359	.625	.229	1.705
Midwest	-.550	.472	1.360	1	.244	.577	.229	1.454

* $\chi 2(4) = 1.908$, $p < .05$. Nagelkerke R2= 2% Correctly classified 62% of cases.

Table 13

*Research Question 8: Binomial Logistic Regression Predicting Likelihood of Receiving Pelvic Exam Based on Geographic Region**

	b	SE	Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
Northeast			3.179	3	.365			
West	.264	.778	.115	1	.734	1.302	.284	5.977
South	.985	.721	1.866	1	.172	2.679	.652	11.011
Midwest	.154	.732	.044	1	.833	1.167	.278	4.900

* $\chi 2(4) = 3.049$, $p < .05$. Nagelkerke R2= 3% Correctly classified 85% of cases.

Table 14

*Research Question 9: Binomial Logistic Regression Predicting Likelihood of Receiving Appropriate Medications Based on Geographic Region**

	b	SE	Wald	df	*p*	*OR*	95% CI	

							95% CI	
							Lower	Upper
Northeast			3.110	3	.375			
West	.489	.508	.929	1	.335	1.631	.603	4.414
South	.598	.508	1.382	1	.240	1.818	.671	4.926
Midwest	-.029	.473	.004	1	.951	.971	.384	2.455

* $\chi 2(4) = 3.140$, $p < .05$. Nagelkerke R2= 3% Correctly classified 57% of cases.

A binomial logistic regression was performed to ascertain the effects of age group on the likelihood that sexual assault patients who present to the Emergency Department will receive HIV/STI screening, treatment, or prophylaxis. All variables were nominal so tests of linearity were not required. Further, there was no multicollinearity or significant outliers. Age 11-20 is the reference category. Of the four predictor variables only one was statistically significant in any age group: appropriate medications. Age 0-10 was statistically significant for 8 times less likelihood of receipt of appropriate medications (as shown in Table 18). None of the other variables were significant in any age group.

Table 15

Research Question 10: Binomial Logistic Regression Predicting Likelihood of Receiving HIV Test Based on Age Group

	b	SE	Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
Age_New			2.772	4	.597			
Age_New (1)	-1.625	1.207	1.813	1	.178	.197	.019	2.096
Age_New(2)	-.074	.738	.010	1	.920	.929	.218	3.947
Age_New (3)	-.508	.799	.404	1	.525	.602	.126	2.880
Age_New (4)	-.654	.885	.546	1	.460	.520	.092	2.948

* $\chi 2(4) = 3.445$, $p < .05$. Nagelkerke R2= 4 % Correctly classified 87% of cases.

Table 16

Research Question 10: Binomial Logistic Regression Predicting Likelihood of Receiving Urinalysis Based on Age Group

	b	SE	Wald	df	*p*	*OR*	95% CI	
							Lower	Upper

Age_New			3.701	4	.448			
Age_New (1)	-1.041	.690	2.281	1	.131	.353	.091	1.363
Age_New (2)	-.606	.580	1.094	1	.296	.5454	.175	1.698
Age_New (3)	-.147	.590	.062	1	.804	.864	.272	2.745
Age_New (4)	-.588	.637	.852	1	.356	.556	.159	1.936

* $\chi 2(4) = 3.808$, $p < .05$. Nagelkerke R2= 3 % Correctly classified 62% of cases.

Table 17

Research Question 11: Binomial Logistic Regression Predicting Likelihood of Receiving Pelvic Exams Based on Age Group

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Age_New			.715	4	.949			
Age_New (1)	.388	.935	.172	1	.678	1.474	.236	9.209
Age_New (2)	.405	.840	.233	1	.629	1.500	.289	7.789
Age_New (3)	-.028	.894	.001	1	.975	.972	.169	5.607
Age_New (4)	.154	.929	.028	1	.868	1.167	.189	7.207

* $\chi 2(4) = .727$, $p < .05$. Nagelkerke R2= .008 % Correctly classified 85% of cases.

Table 18

Research Question 11: Binomial Logistic Regression Predicting Likelihood of Receiving Appropriate Medications Based on Age Group

	b	SE	Wald	df	*p*	*OR*	95% CI Lower	Upper
Age_New			14.750	4	.005			
Age_New (1)	-2.580	1.145	5.074	1	.024	.076	.008	.715
Age_New (2)	.708	.588	1.447	1	.229	2.029	.641	6.425
Age_New (3)	1.061	.610	3.027	1	.082	2.889	.874	9.544
Age_New (4)	.076	.645	.014	1	.907	1.078	.304	3.820

* $\chi 2(4) = 28.02$, $p < .05$. Nagelkerke R2= 21 % Correctly classified 65% of cases.

In summary, there is a statistically significant difference between white and black races (independent variables) and receipt of HIV tests (dependent variable) among sexual

assault survivors in the Emergency Department. There is not a statistically significant difference between black and white races and urinalysis, pelvic exams, and appropriate medications received among sexual assault survivors in the Emergency Department.

Further, there is not a statistically significant difference between high and low SES (independent variable) and receipt of HIV tests, urinalysis, pelvic exams, and appropriate medications (dependent variables) among sexual assault survivors in the Emergency Department. Third, there is a statistically significant difference between receipt of HIV tests among patients in the West compared to patients in the Northeast, despite there being a greater number of sexual assaults in the Northeast. A patient in the West has an 8.7 greater likelihood of receiving an HIV test than patients in the Northeast. There were no other statistically significant differences based on geographic region.

A fourth significant difference found was the receipt of appropriate medications. Patients age 0-10 had an 8 times lower likelihood of receiving appropriate medications than patients in the reference group. There was not a statistically significant difference between age and testing/screening/medications in other age groups.

In Section 4 the findings will be analyzed and interpreted. Limitations of the study will be discussed. Recommendations for further research and practice will be made.

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

The purpose of this research was to identify and describe factors that influence whether sexual assault survivors were offered HIV/STI screening or testing, and/or treatment/prophylaxis when they presented for care in hospital EDs. Only Black and White races were used in the final sample where race was a variable because there was not a large enough number of other races to perform regression. Subjects were divided into two categories also for the purpose of binomial regression. Participants were placed in the high socioeconomic status category if they had private insurance, Medicare, or Worker's Compensation insurance. They were categorized as low socioeconomic status if they were self-pay, no charge, or had Medicaid. Geographic regions and age groups were added to the independent variables because there seemed an opportunity for new knowledge.

I then specifically looked at the influence of these races, socioeconomic statuses, geographic regions, and ages on whether patients received HIV tests, urinalyses, pelvic exams (females only), and appropriate medications. Medications were deemed appropriate if they included drug classes commonly given to sexual assault victims as part of protocol, specifically, antibiotics, anti-HIV, emergency contraception (females only), or vaccines. That is not to say that other medications given were not appropriate for some other aspect of patient care.

Interpretation of the Findings

An underlying assumption of this study was that sexual assault is a risk factor for acquiring sexually transmitted infections and both are serious public health problems.

Further, use of HIV screening/testing and prophylaxis has been found to be low in the general ED and the subset sexual assault population (Ende et al., 2008; Merchant & Catanzaro, 2009; Rothman et al., 2011). Specifically, Ende et al. (2008) found that 65% of sexual assault survivors received screening and prophylaxis in New York State EDs. Merchant and Catanzaro (2009) found that 20% of their NHAMCS sample of sexual assault patients received HIV testing.

In the current study, I found that 13.2% of the total sample received HIV screening and 12.6 % received prophylaxis. This seems to confirm underuse of HIV screening/testing and/or prophylaxis in the ED and among sexual assault patients. DuMont et al. (2017) concluded that services were not extended to all sexual assault patients. That may be a reason for the small percentages found in the current study. It is possible that some procedures or medications were not appropriate based on age or other characteristics. Barriers surrounding medication acceptance and compliance (Dejelaj et al., 2017) may have also had an impact on this study. Finally, patients may choose not to partake of services, which influences results. Amey and Bishai (2012) set a precedent for studying the quality of services extended to female victims of sexual assault. Their study was the inspiration for the current study. Amey and Bishai (2012) found that Black women received more services.

In the current study, I extended the knowledge base in the discipline by including men and did not find a difference in services received between Black and White except for HIV testing, which was higher in White individuals. This seems to be a contradiction of Amey and Bishai's (2012) findings and the general findings of Lo et al. (2018) who

observed higher rates of HIV testing in Blacks than in Whites in the general population. A further expansion of knowledge was found in the current study by adding SES, region, and age as independent variables. Although the other services studied were underused, there was not a statistically significant difference in care associated with race or SES.

Interpretation of Findings by Research Question

RQ1 addressed whether there was a statistically significant difference between races (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED. The null hypothesis was rejected because White people had a 3 times higher likelihood of receiving an HIV test after sexual assaults than did Black people. As noted in the previous section, this is a contradiction to previous findings that indicated Blacks had a greater likelihood to receive HIV tests in general and after sexual assault in particular.

RQ2 addressed whether there was a statistically significant difference between races (independent variable) and receipt of urine tests and/or pelvic exams (dependent variables) to diagnose sexually transmitted infections among sexual assault survivors in the ED. The null hypothesis was accepted because there were no statistically significant relationships found.

RQ3 addressed whether there was a statistically significant difference between races (independent variable) and receipt of HIV/STI medication treatment or prophylaxis (dependent variable) among sexual assault survivors in the ED. The null hypothesis was true because there was no statistically significant relationship found.

RQ4 addressed whether there was a statistically significant difference between SES (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED. The null hypothesis was true because there was no statistically relationship between variables. This is most likely because the number of people receiving HIV tests in the entire sample was only 21, and some patients were excluded because there was not enough socioeconomic information.

RQ5 addressed if there was a statistically significant difference between socioeconomic status (independent variable) and receipt of urine tests and/or pelvic exams to diagnose sexually transmitted infections (dependent variable) among sexual assault survivors in the Emergency Department. The null hypothesis was accepted that there was no significant difference.

The same was true for RQ6 about if there was a statistically significant difference between socioeconomic status (independent variable) and HIV/STI medication treatment or prophylaxis received (dependent variable) among sexual assault survivors in the ED. The answer was no, so the null hypothesis was accepted.

RQ7 addressed whether there was a statistically significant difference between geographic region (independent variable) and receipt of HIV tests (dependent variable) among sexual assault survivors in the ED. The null hypothesis was rejected because patients in the West received HIV tests 8.7 times more than the Northeast despite having a lower number of sexual assault patients.

RQ8 addressed whether there was a statistically significant difference between geographic region (independent variable) and receipt of urinalysis or pelvic exam

(dependent variable) among sexual assault survivors in the ED. The null hypothesis was accepted because there was not a statistically significant difference. The null hypothesis was also accepted for RQ9, which addressed whether there was a statistically significant difference between geographic region (independent variable) and receipt of appropriate medications (dependent variable) among sexual assault survivors in the ED.

RQ10 addressed whether there was a statistically significant difference between age (independent variable) and receipt of urinalysis or pelvic exam (dependent variable) among sexual assault survivors in the ED. The null hypothesis was true because there was no significant relationship.

RQ11 addressed whether age and receipt of appropriate medications was significant among sexual assault survivors in the ED. The null hypothesis was rejected because patients between ages 0 and 10 had an 8 times lower likelihood to receive appropriate medications than the reference group. This may be because the sample were children for whom some medications may not be appropriate or approved.

Limitations

Limitations of all studies of sexual assault include difficulty identifying victims. This was also a limitation of the current study and resulted in a small sample size and a possible threat to validity related to selection of the sample. Participants were identified as sexual assault survivors by ICD 9 codes, 58300 adult sexual abuse, 58301 child sexual abuse, V71.5 observation after alleged rape or sexual assault, and E code 9601 rape. It is possible that some sexual assault patient records were not coded as such, but rather as other injuries they may have presented with. Another limitation was that there were not

enough nonwhite and nonblack patients to perform regression, and they were excluded from the final analysis because the sample size of 122 still had adequate power.

The assignment of high or low SES assumed that private insurance, Medicare, and Worker's Compensation patients had higher income than self-pay, no charge, and Medicare patients. This may impact validity as there may be more effective ways to determine SES. The blank, unknown, and other categories were excluded. The sample size of 126 still had adequate power. The main threats to reliability are sampling errors that occurred in the original database and missing race and/or socioeconomic status data. As the current study was specific to sexual assault patients in EDs, it is not generalizable to other populations. As this was a cross sectional study, and I studied a given point in time, causality cannot be proven. A common use is to identify risk factors, which I did in this study. The study can still be useful when assessing the health needs of populations. The study also affords the opportunity to develop hypotheses about cause as long as threats of bias are evaluated. Uncertainty regarding the order of causation depends on the cause and how it is measured.

Recommendations

Recommendations inspired by the current study include further research with larger sample sizes. This could help to determine the full extent of services offered to sexual assault survivors in the EDs of US hospitals. This study looked at only four of many recommended services. Another benefit of a larger sample size would be to include more races and the ability to confirm or reject previous findings such as Amey and Bishai (2012) and Lo, Runnels, and Cheng (2018).

Further, this study only looks at whether the service was given and does not reflect if it was offered and refused or inappropriate for some other reason. Knowing whether patients accepted or declined services offered would be helpful in determining whether there are barriers to acceptance. Knowing whether patients were appropriate for services would help determine whether there is a knowledge deficit among care providers. These observations could also influence the design and implementation of interventions on the socioecological level where they would be most effective. It would be interesting to determine whether services are more consistently offered across race, socioeconomic, age, and geographic regions in hospitals that use a standardized protocol or specially trained staff such as Forensic Nurse Examiners. While conventional wisdom seems to support the notion that it does, some previous studies suggest it does not (Draughon, Anderson, Hansen, & Sheridan, 2014). The NHAMCS would be a good data base to use for that inquiry.

Implications for Professional Practice and Social Change

Professional Practice

Standardizing terms, definitions, and reporting requirements across all law enforcement, healthcare, government, and social science disciplines would improve further research into the experience of sexual assault survivors. This would improve documentation, the ability to collect and compare data during research of all disciplines. Criminal justice statistics, medical records, and injury reporting that was comparable on local, state, and national levels would enhance the ability to do research within this vulnerable population without putting a further burden on them. In NHACMS data,

specifically ensuring the correct ICD code for suspected or alleged sexual assault/abuse is documented in all cases would help to identify patients for future research. Including male victims in all studies of sexual assault will help to collect more data on a segment of the population where there is currently little knowledge available.

It is generally accepted that standardized protocols help to ensure safer care and better communication among caregivers. Evidence based protocols and guides are known since the 1990's to improve patient outcomes, promote high quality care, improve medicolegal robustness, and reduce costs. They also provide a metric architecture for future quality and other assessments.

Specialized protocols for sexual assault exist as do specially trained forensic nurse examiners and other professionals who carry them out. It isn't known if any of the participating hospitals had protocols for the management of sexual assault patients, however it behooves one to wonder whether the results of the current study would be found if a standard protocol was in place? All hospitals could study their community level data to determine whether there are any discrepancies in the way protocols are being carried out and why.

Further, this study can have all caregivers question whether we have preconceived notions that affect our judgement when using optional risk-based guidelines over routine screening for HIV. How do our posture, attitude, and presentation of facts when offering HIV screening and/or prophylaxis convey our feelings about race, socioeconomic status, sexual assault, and/or the acceptance of HIV screening/prophylaxis? Do these things influence whether a patient accepts?

Positive Social Change

A positive social change that could occur as the result of this study would be improved care of survivors of sexual assault as it relates to HIV/STI screening/testing and prophylaxis. A caregiver who is aware that discrepancies in services can occur may incorporate offering HIV screening on the individual level into their patient routine. That caregiver can also promote the use of standardized protocols and specialized staff in the hospital community level. This could eventually result in decreased rate of HIV transmission in the community. That in turn could decrease the cost of HIV and sexual assault aftercare on the community and societal level.

Another positive social change that could occur as a result of the application of this study is less social stigma for sexual assault victims. A standardized protocol that makes HIV screening a routine does not single out any one person or group or make value judgements. Early identification is often hindered by stigma, but a protocol reduces the risk, by letting patients know it is a part of comprehensive health care.

Finally, contributing to the knowledge base about sexual assault victims contributes to positive social change. Increased awareness of the challenges of sexual assault victims that filters up to the policy making level can help to influence the priority given to research funds, the enactment and enforcement of laws, and the support of evidence-based interventions.

Conclusion

This study has provided important information about the care and services provided to sexual assault patients in United States EDs. Specifically, a white patient has

a 3 times greater likelihood of receiving HIV testing than a black person. Patients in the Northeast have an 8.7 times lower likelihood to receive an HIV test than patients in other geographic regions, despite a greater number of sexual assault patients. Patients in the age group of 0-10 have an 8 times lower likelihood of receiving appropriate medications than the reference category. This is important new information that contributes to and fills gaps in the knowledge base for the care of sexual assault victims in US Hospital EDs and suggests hypotheses for future research.

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